



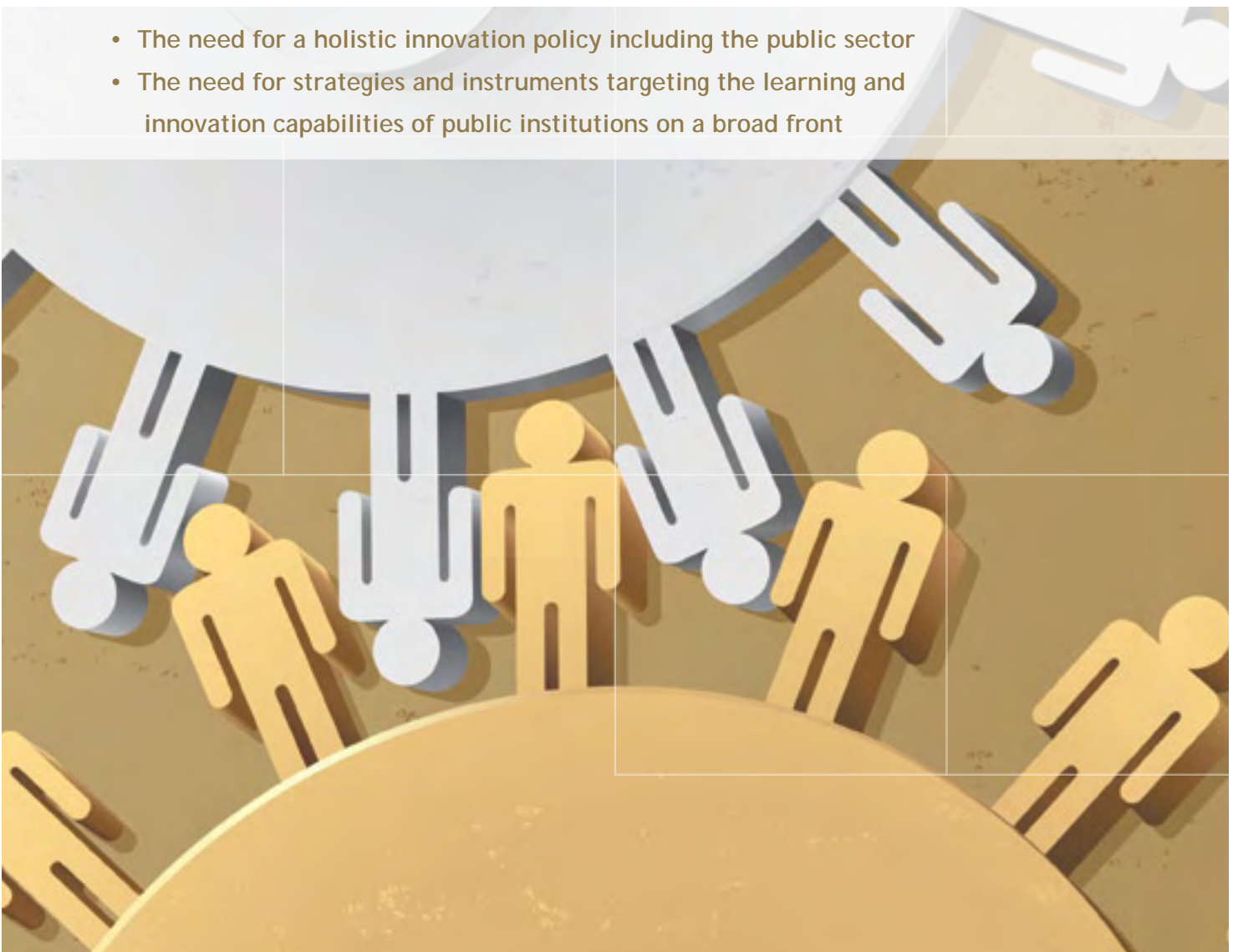
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Interact - innovation in the public sector and public-private interaction

- The need for a holistic innovation policy including the public sector
- The need for strategies and instruments targeting the learning and innovation capabilities of public institutions on a broad front



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Abstract:	
<p>The Interact project has studied how innovation processes take place in the public sector. The project has been focusing on i) the dynamic of mixed arrangements of public organisations, private companies and non-governmental organisations and ii) the health and social services sectors in the Nordic countries.</p> <p>Interact used the methodological and theoretical basis of the EU Fifth Framework Programme project Publin – Innovation in the Public Sector. Traditionally, the public sector has been seen as bureaucratic and reluctant to change. According to this view, the functions of public institutions are limited to regulatory frameworks for innovation activities or a market for innovation products generated by private actors. However, the result from the PUBLIN research programme points to an alternative view of the public sector. The basic assumption for the Interact project is that public organisations are constantly changing and that they do have their own share of entrepreneurs. Accordingly, innovation is omnipresent in the public sector.</p> <p>Interact case studies been carried out in the Nordic countries and they largely confirm the findings of PUBLIN. The main message from Interact is that innovation in the public sector must not be reduced to a matter of delivering new technologies to a passive recipient, the non-innovative public sector. Much innovation is taking place in the public sector, within and outside the scope of policy planning. Interact believes that it would make sense to expand the current innovation policies in the Nordic countries to include i) innovation in the public sector as regards its effect on innovation in the private sector, and visa-versa, ii) innovation in the public sector per se, i.e. as regards the effects these activities have on the institutions capabilities to learn and innovate, and iii) a common learning and innovation arena including public, private and civil organisations.</p>	
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Executive summary

Background

There is a general agreement that the Nordic economic strength and welfare development is dependent on our societies' abilities to build relevant competences, adapt to change and find ways of solving our most pressing problems. However, most policy discussions on innovation focus on the innovation that takes place in the private sector.

The public sector is often understood as a passive receiver of new products, processes and services developed by private companies. To the extent public institutions do innovate these activities are classified as expenses, not investments. Furthermore, policies for the development of the public sector is normally labelled with terms like "modernisation" and "increased efficiency" and is more concerned about saving costs than improving the innovative capabilities of the public institutions as such.

Interact takes another approach, considering public sector learning as an integrated part of our societies' ability to innovate.



Scope

Interact uses the methodological and theoretical basis of the EU Fifth Framework Programme project Publin - Innovation in the Public Sector.¹

Interact report No. 2 presents six case studies of innovation within health and social services in the Nordic countries, the Faeroe Islands included.

Interact report No. 3 contains an analysis of the role of the public sector in Nordic innovation policy development. It also contains an appendix with presentations of relevant white papers, green papers and selected policy measures from the six countries.²

¹ www.step.no/publin

² The reports can be downloaded from www.step.no/interact.

Policy recommendations

The need for a holistic innovation policy including the public sector

The main message from this report is that innovation in the public sector must not be reduced to a matter of delivering new technologies to a passive recipient, the non-innovative public sector. There is a lot of innovation taking place in the public sector, within or outside the scope of policy planning. What is needed now are policies with a more comprehensive and broad based approach to innovation in the public sector, and which takes all relevant forms for learning, interaction and innovation practices into consideration. The use of knowledge is as important as the production of knowledge, and the social aspects of learning is as important as the technical ones.

The Nordic countries are lucky in having some of the most advanced and knowledge intensive public sectors in the world. No doubt this is a contributing factor to some of the wealth creation taking place in these countries. However, we still have not fully grasped the effects the public institutions have on innovation in the private sector, nor do we fully understand the interaction between the two sectors. What Publin and Interact have demonstrated is that it is more fruitful to understand productivity growth and wealth creation as the effect of innovation taking place in one large innovation system consisting of innovative people and institutions within all three sectors: private, public and civil. We need innovation policies with the same approach, which necessitates closer cooperation between various ministries and agencies on the innovation policy side.

Interact believes that it would make sense to expand the current innovation policies in the Nordic countries to include:

1. Innovation in the public sector as regards its effect on innovation in the private sector, and visa-versa.
2. Innovation in the public sector per se, i.e. as regards the effects these activities have on the institutions' learning and innovation capabilities
3. A common learning and innovation arena including public, private and civil organisations.

Beyond the quest for cost effectiveness

While innovation policies for the private sector increasingly include the systemic aspect of innovation and is focused on the "absorptive capacities" of companies (i.e. the firms' ability to find, understand and make use of knowledge in innovative practices), innovation policies targeting the public sector are more traditional. There is a strong focus on technology push, meaning research and engineering taking place outside the public institutions, and on reforms for cost reductions and increased efficiency. Both these elements are necessary. However, Interact argues that there is also a need for strategies and instruments targeting the learning and innovation capabilities of public institutions on a broad front. In other words: policy makers, civil servants and public service providers have to turn around a take a look at their own innovation processes.

This entails a stronger awareness of both their own employees' ability to understand and make use of new technologies and new knowledge. However, it is equally important to understand the social processes underpinning learning and innovation, in order to identify existing drivers and barriers. The research done by Interact, and its

EU predecessor Publin, clearly shows that the development of people skills is extremely important if one want to encourage innovation in these institutions.

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Innovation in the public sector

An innovation policy for the public sector

The public sector is responsible for some 50 to 60 percent of GDP in the Nordic countries, and the sector is seen as an important vehicle for social policies and welfare development. Needless to say, the ability of the public institutions to perform efficiently and produce the services and tasks society asks of them is important, and indeed, there is a continuous debate on public sector performance in the media and in policy circles.

The starting point for this project is the hypothesis that the ability of public institutions to deliver relevant high quality services is their ability to learn and to innovate, i.e. their ability to change behaviour in order to achieve particular objectives.

The goal of Interact has been twofold:

1. We have as an extension of the EU 5th Framework Programme project Publin - Innovation in the Public Sector³ tried to learn more about how innovation takes place in Nordic public institutions. This has been done through several case studies; all presented in Interact report No. 2.
2. We have tried to ascertain to what extent Nordic governments have a clear vision as regards an innovation policy for the public sector, in order to see whether there is a need for further efforts in this field. This study is presented in report No. 3.

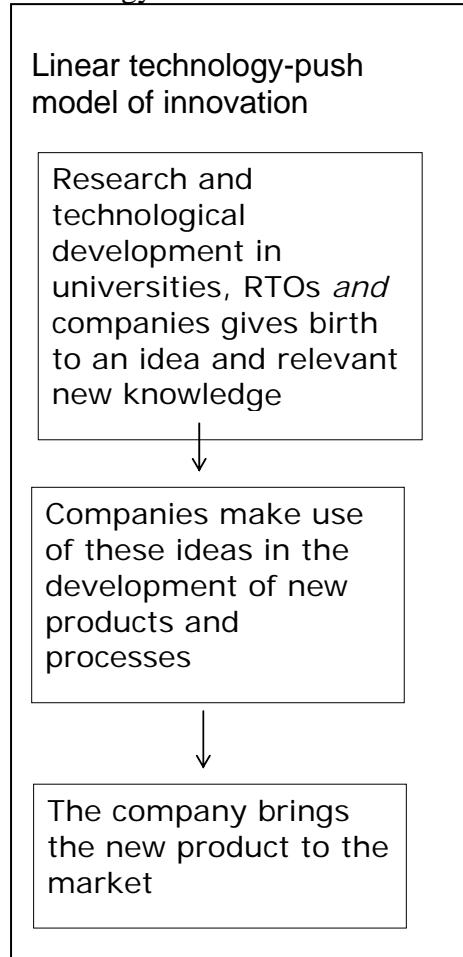
It should be noted that Interact, like all innovation policy projects under the Nordic Innovation Centre, is not a research project in the strict sense of the word. The main point is to make use of existing material for a policy oriented analysis leading to concrete policy recommendations. The theoretical and methodological foundation for Interact is found in Publin and we refer our readers to the Publin reports for more information and references.

Before we go on answering the questions on whether there is innovation in the public sector in the Nordic countries and whether the relevant governments have developed innovation policies for these institutions, we need a clear idea about what innovation means and what an innovation policy is. Given that these concepts have been adapted from the private sector, we will first discuss what they mean in an industry policy context.

³ For Publin reports, see www.step.no/publin.

On industrial systemic innovation policy

In the early 1990s the term was introduced in policy circles⁴ as a concept that should help policy makers expand their view of how learning and knowledge creation takes place in society, a concept that went beyond the traditional views of science and technology as the main driver for economic growth and wealth creation. The new



view was based on new strands of economic theory, in particular systemic evolutionary economics and, partly, so-called new growth theory.⁵

This new research understood knowledge creation and innovation in industry not as the end result of processes starting in research, but as the result of interactive learning processes involving the whole so-called innovation system, i.e. not only universities, science labs and high tech companies, but all companies and their surrounding environment, laws, regulations and public organisations included.

Hence this was a move from a research oriented science and technology policy to a company centred innovation policy, where the end result – understood as change and the capability of adapting to changing framework conditions – was seen as the result of not only research and development, but also innovation practices like incremental improvements of products, processes and services, and activities like branding, marketing and design.

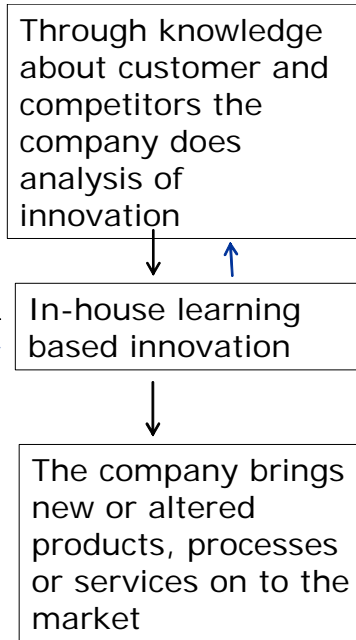
The adaptation of competences and technologies from others was also seen as important, i.e. the acquisition and use of machinery, and learning through the interaction with other companies and knowledge institutions.

This led to a redefined understanding of knowledge transfer. Where traditional science and technology policies had focused on technology transfer from universities to industry, the new approach looked at all kinds of interaction in the innovation system, including business to business collaboration, the idea being that innovation is based on learning and that learning is dependent on efficient personal and institutional networks. Without such networks the diffusion of knowledge will be hampered.

⁴ See for instance the OECD Technology Economy Programme (TEP)

⁵ For a recent introduction to innovation theory see *The Oxford Handbook of Innovation* edited by Jan Fagerberg, David C. Mowery and Richard R. Nelson (Editor), Oxford University Press 2006. See also the literature list of this report.

Market pull & company learning model



This focus on personal learning and networking was followed by shift of focus from concepts like “information” to concepts like “knowledge” and “competences”.

Competences can be understood as information that has been internalised by the individual. These are not data or codified facts found on paper. Competences are skills that have been put into practice. The individual knows how to find, understand and

make use of relevant knowledge and technology. This total set of competences is unique for the individual and some of this experience is not easily transferable to others.⁶

This “tacit” knowledge undermined the idea of knowledge as a free commodity that is easily transferred from one company to another. Even if such knowledge is “codified” and put on paper, other companies might find it hard to make use of it, because the understanding of this knowledge requires a specific background. This line of reasoning led to a new type of innovation policy that put more stress on the “absorptive capacities” of firms, which means, essentially, their ability to find, understand and make use of knowledge developed by others. Hence policy measures for company learning, industry-university collaboration (as opposed to one-way technology transfer) and lifelong learning⁷ were launched.

This does not mean that the more traditional types of policy instruments of science and technology policy disappeared. Far from it! First of all it is recognized that research and development play an important role in the industrial learning processes also in a company centred model of innovation. In some industries, especially those labelled as “high tech”,⁸ R&D represents an efficient way of learning and creating new and improved products, processes and services.

Moreover, the competence base of these companies relies on the existence of personnel trained in the theory and methods of science and engineering, skills that are needed in order to make sense of knowledge and technology developed elsewhere. Partly because of this even “low tech” companies – i.e. companies that invest little in

⁶ For a discussion on concepts like learning, knowledge and competences, see the appendix to this report.

⁷ For a comprehensive overview of innovation policy measures in Europe, see the EU Trend Chart on innovation (www.trendchart.org) and the NICE project GoodNIP Good Practices in Nordic Innovation Policies (www.step.no/goodnip).

⁸ Per definition companies investing heavily in R&D (as percentage of turnover)

R&D – may go through learning processes influenced by R&D. The learning capabilities of their employees may be based on scientific and technological training. Indirectly R&D also influences their innovation activities through the acquisition of new machinery and other types of technology and through collaboration with R&D intensive suppliers, customers and research institutions. Hence the overall R&D capacity of an innovation system is important, also for those companies that do not take active part in R&D activities themselves.

It should be added, though, that many contemporary innovation policy strategies and measures continue to be based on the older linear understanding of the role of science and technology, with universities and colleges understood as the main drivers for economic development.

On the industrial holistic innovation policy

The latest development in the area of innovation policy has been the birth of the so-called “third generation” or “broad-based holistic” innovation policy. This type of policy can be understood as an extension of the systemic innovation policy described above.⁹

A holistic innovation policy is based on the understanding that company learning and the innovative capabilities of firms are based on the framework conditions the firms are operating within. These framework conditions are influenced by policy decisions made by practically all ministries, not only those that traditionally are responsible for research and innovation policies (like ministries of research and ministries of trade and industry).

The Ministry of Finance will, for instance, influence the innovation investments of companies through tax policies. The Minister of Education will lay the foundation for the skills of future employees, and the Minister of the Environment may introduce regulations that might both stimulate innovation and put other companies in their grave.



⁹ For a presentation of holistic innovation policies, see the OECD MONIT project. <http://tinyurl.com/y8wwzd> and *Innovation Tomorrow, Innovation policy and the regulatory framework: Making innovation an integral part of the broader structural agenda*, DG Enterprise 2002, Contractors: Louis Lengrand & Associés (France) PREST (University of Manchester, United Kingdom) ANRT (France)

A third generation innovation policy

An innovation policy study written for the Commission's Enterprise DG argues the case for a "third generation innovation policy that recognises the centrality of innovation to effectively all policy areas".

Even though progress has been made in building an "innovative society", the study, called *Innovation Tomorrow*, argues that a new generation of policy is required, which embeds innovation in all relevant policy fields, from research, to competition and regional policy.

While the first generation of innovation policy was based on the idea of a linear process for the development of innovations, the second generation emphasises the importance of the systems and infrastructures that support innovation. The 'third generation innovation policy' would place innovation at the heart of each policy area. "The common aim is to maximise the chances that regulatory reform will support innovation objectives, rather than run the risk of impeding or undermining them," states the paper.

"Innovation in a knowledge-based economy is diverse and pervasive. It is not just based on research, or science and technology, or enterprise and ingenuity. Innovation [...] also depends on organisational, social, economic, marketing and other knowledge," the policy study says.

Policy areas impacting on innovation are listed as competition, trade, intellectual property rights, enterprise, research, information and communication technologies, financial services and risk capital, education, taxation, regional policy, employment and environment, with competition having the greatest impact.

http://cordis.europa.eu/innovation-policy/studies/gen_study7.htm

This also means that innovation policy strategies and measures put into place by one ministry may be undermined by measures launched by another. And measures introduced by one agency may pull in another direction than one introduced by another.

Because of this it has been argued that the government need to develop a cross-ministerial holistic innovation policy that takes all these areas of responsibility into consideration.¹⁰ The plan for a holistic innovation policy developed by the previous Norwegian government is an example of such a strategy.¹¹

The public sector does definitely play an important role in third generation innovation policies. Still, these are seldom innovation policies *for* the public sector. These are innovation policies with a stronger focus on the role public institutions play for innovation in the *private* sector.

Obviously, the public institutions' ability to learn, innovate and adapt will also have repercussions for private sector innovation, to the extent these activities are of relevance to companies. However, we are also interested in knowing the effect such innovation has on the performance of the public institutions in and for themselves. Moreover, is there a holistic third generation policy for innovation in the public sector?

¹⁰ See for instance the OECD MONIT project.

¹¹ *Fra ide til verdi, Regjeringens plan for en helhetlig innovasjonspolitik*, Nærings- og handelsdepartementet, Oslo 2003.

http://www.dep.no/nhd/norsk/dok/andre_dok/handlingsplaner/024071-220005/dok-bn.html

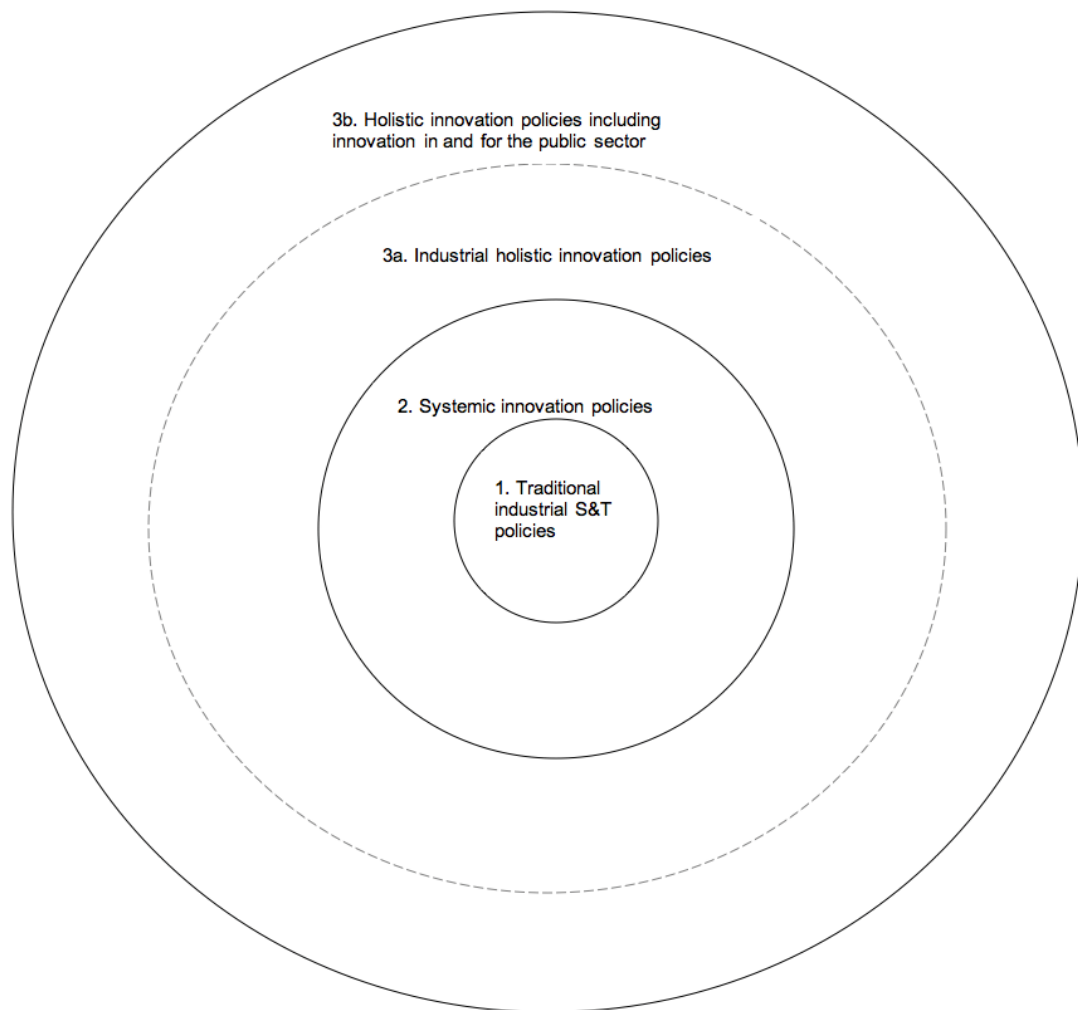


Figure representing the three generations of innovation policy:

1. Traditional technology push science and technology policies focusing on (university) science and company engineering. Main responsibility of ministries of science, industry and the economy.
2. Systemic company centred innovation policies focusing on learning and innovation in companies and their interactions with other companies and institutions in the innovation system. Main responsibility of ministries of science, industry and the economy.
3. Holistic innovation policies similar to 2, but including the effects of decisions made within other policy areas, including transport, child care, law and order, and more. The public sector is normally included to the extent public services influence the innovative capabilities of firms. 3b above illustrates a holistic innovation policy that takes into consideration innovation taking place in and for public institutions.

Innovation in the public sector

There is a common conception that there is no innovation in the public sector, and – even – that the term “innovation in the public sector” is a contradiction in terms. There may be several reasons for this:

One is based on the meetings people have had with hard-headed bureaucrats and risk averse civil servants. And there is no reason to deny that the public sector has its share of less creative personalities. (But then again, so do private companies).

The second is the fact that many civil servants and public institutions do not market themselves as innovative. Many of them consider themselves safeguards against reckless spending, irregularities and lawlessness, and – indeed – this is also in many cases the role they should play.

Differences between private and public sector innovation

	Private Sector	Public Sector
Organising Principles	Pursuit of Profit, of Stability or of Growth of Revenues.	Enactment of Public Policies.
Organisational Structures	Firms of many sizes, with options for new entrants.	Complex system of organisations with various (and to some extent conflicting) tasks
Performance Metrics	Return on Investment	Multiple performance indicators and targets
Management Issues	Some managers have considerable autonomy, others constrained by shareholders, corporate governance, or financial stringency. Successful managers liable to be rewarded with substantial material benefits and promotion.	While there are efforts to emulate private sector management practice, managers are typically under high levels of political scrutiny. Successful managers likely to receive lower material benefits than comparable private sector managers.
Relations with: ~ End-Users	Markets may be consumer or industrial ones, and firms vary in the intimacy of their links with the end-users of their products, but typically market feedback provides the verdict on innovation.	End-users are the general public, traditionally seen as citizens, though recently there have been efforts to introduce market-type principles and move to see them as customers or consumers.
~ Supply Chains	Most firms are parts of one or more supply chains, with larger firms tending to organise these chains.	Public sector is typically dependent on private suppliers for much of its equipment, and is a very important market for many firms.
~ Employees	Nature of workforce varies considerably, and relations between employees and management range from fractious to harmonious. Efforts are made in some firms to instil company loyalty and/or a customer-centric approach, but employee motivations are often mainly economic ones of securing a reasonable income..	Public sector employees are typically highly unionised (economists and social scientists in the central administration and health- and social professionals as nurses, social workers, child-care workers, teachers etc in the public services). Many are also professional workers organised through professional associations. While usual concerns about status and salary are experienced, many workers enter public

		service with idealistic motivations.
~ Sources of Knowledge	Companies have considerable flexibility in sourcing innovation-related information from consultants, trade associations, and public sector researchers, but many smaller firms have limited resources to do so.	Despite large resources, parts of the public sector may be constrained from using private sources of knowledge (other than those of suppliers). Public sector sources of knowledge (e.g. Universities) may be highly oriented to other parts of the public sector.
Time Horizon	Short-term in many sectors, though utilities and infrastructural services may have very long horizons	Short-term: policy initiated innovations need to pay off within the election period.

These must be considered archetypal features of the public and private sectors and their relations to the propensity and direction of innovation. The table above is based on a table developed by Ian Miles (2004). See Publin report D9 *On the differences between public and private sector innovation* by Thomas Halvorsen, Johan Hauknes, Ian Miles and Rannveig Røste for a more elaborate version.

Another explanation is found in the linear model described above. If innovation is understood as R&D only and the institutions do not perform or even commission research, well, then they cannot be considered innovative.

However, even if we understand “innovation” to mean “deliberate change of behaviour with a specific objective in mind” (the Publin definition), many civil servants find the term unfamiliar. There *is* innovation, but the word is interpreted to mean science and technology based research and development, which is not a type of activity most civil servants take part in on a daily basis. Their innovation is more of the incremental type: day to day learning through the interaction with other.

To the extent there are systematic, planned innovation processes taking place, these are often labelled as “rationalisation”, measures for “increased efficiency”, “modernization” or “renewal”. Moreover, these alternative terms often reflect a more limited concept of innovation. Innovation is here understood as cost savings within an already given system or for existing procedures, it does not entail changes in the existing practices as such beyond what is needed to cut budgets. This is particularly true for new public management practices based on governance by objectives (*mål og resultatstyring*). Hence, even if this is innovation in the sense of change of behaviour, it is not radical or creative innovation, and is therefore not understood as innovation by the public.

However, as the Publin project clearly documented and Interact confirms, there is a lot of innovation taking place in the public sector—of nearly all types—also outside the public research institutions. This should actually come as no surprise as it is human nature to try to change tactics when problems are not solved. The incentive structures in some public institutions and some systems may not encourage such behaviour, but nevertheless, such innovation does take place.

Moreover, as Publin found, there are also entrepreneurs in public institutions, people that initiate change and continuously work to improve the services they provide, both

on the service level – i.e. front offices facing the general public – and on the policy level, i.e. in ministries and public agencies.

Types of innovation

There are several types of innovation in the public sector. Publin listed at least six:¹²

- **new or improved services** (e.g. improved health care at home)
- **process innovation** (a change in the manufacturing of a service or product)
- **administrative innovation** (for example the use of a new policy instruments, which may be the result of a policy change)
- **system innovation** (a new system of fundamental change of an existing system, for instance by the establishment of new organisations or new patterns of co-operation and interaction)
- **conceptual innovation** (a change in the outlook of actors; such changes are accompanied by the use of new concepts, for example integrated water management or mobility leasing)
- **radical changes of belief systems or rationalities** (meaning that the world view or the mental matrix of the employees of an organisation is shifting)

All of these types are also found in private companies and in civil organisations. However, the Publin researchers argued that there are differences between the public and private sectors as regards innovation.¹³

For instance: Public organisations are primarily suppliers of services, and not of products or production processes leading up to the production of “hard physical objects.” This means that public institutions normally have more in common with the private service sector, than traditional manufacturing industries. Policy wise this leads to the same problems as for the development of innovation policies for services. Policy makers find it hard to grasp the competence needs of private service providers as well, as they are often *not* directly based on active research performed by the companies themselves.

Furthermore, public institutions are not competing in order to maximize profits. This lack of profit seeking is often interpreted as a lack of a major incentive for innovation. However, as the Publin researchers point out, the idea that profit seeking is the major driver for company innovation is probably too simplistic. Both private and public employers may be motivated by idealism, the joy of creating something new, an intense interest in the topic at hand, friendship and the sense of belonging, career ambitions etc.

¹² Publin report No. D24, p. 15.

¹³ See for instance Publin report D9 *On the difference between the public and the private sector* by Ian Miles and Rannveig Røste.

That being said, the lack of profit seeking may be replaced by other incentives in the public sector. This is succinctly expressed in the British TV comedy *Yes Minister* where Permanent Secretary (*Departementsråd*) Sir Humphrey Appleby is appalled when finding out that someone in the system has actually managed to save money:

“I asked him [the minister’s Private Secretary Bernard Wooley] why he was looking worried. He revealed that he genuinely wanted the Department of Administrative Affairs to save money.

This was shocking. Clearly he has not yet grasped the fundamentals of our work.

There has to be some way to measure success in the Service. British Leyland can measure success by the size of its profits. [...] However, the Civil Service does not make profits or losses. Ergo, we measure success by the size of our staff and our budget. By definition a big department is more successful than a small one.

It seems extraordinary that Wooley would have passed through the Civil Service College without having understood that this simple proposition is the basis of our whole system.”¹⁴



Another factor that makes the public sector different from the private sector is the unit of analysis. Most public institutions or units are part of a greater chain of command where it is hard to draw definite lines. For instance, a hospital may interact closely with a directorate of health, which again interacts with the ministry of health. The innovation activities in these institutions are strongly influenced by decisions made higher up in the hierarchy or by proposals forwarded by units lower down in the chain of command. The closest phenomena we can find on the private side of the fence is probably the inner life of a huge multinational.

Furthermore, the political aspect is more important in the public sphere. Public sector institutions are at least formally controlled by elected politicians, while private institutions are normally only indirectly affected by policy decisions (through laws, regulations and policy instruments).

¹⁴ *The Complete Yes Minister*, by Jonathan Lynn and Anthony Jay, BBC Books, Chatam 2003.

Innovation defined

Publin presented several definitions of innovation, but these definitions all had one thing in common. They all described innovation as *a deliberate change in behaviour with a specific objective in mind*.

The following more theoretic definition is found in the Publin D20 academic summary report:

Innovation is a social entity's implementation and performance of a new specific form or repertoire of social action that is implemented deliberately by the entity in the context of the objectives and functionalities of the entity's activities.

Green, Howells and Miles (2001), in their investigation of service innovation in the European Union, provide a related definition of the term innovation, which denotes a process where organizations are

...doing something new i.e. introducing a new practice or process, creating a new product (good or service), or adopting a new pattern of intra- or inter-organizational relationships (including the delivery of goods and services).

What is clear from Green, Howells and Miles' definition of innovation is that the emphasis is on novelty. As they go on to say,

"innovation is not merely synonymous with change. Ongoing change is a feature of most... organizations. For example the recruitment of new workers constitutes change but is an innovative step only where such workers are introduced in order to import new knowledge or carry out novel tasks.

The ways most people reflect over the innovation concept in both everyday and analytical usage tend to carry with them a reification – or even materialisation – of innovation. Deliveries from the pharmaceutical industry come to mind.

Innovation in the public sector may indeed include the production of material "things" or products, but more often that not public innovation entails the application of already existing "things" or the delivery of services, accompanied by organizational change and policy development.

There are also differences in management incentives. Publin points out that public managers in general are more likely to receive lower and less performance-based benefits. This may reduce their willingness to take risks.

A less forgiving environment for failure in the public sector may strengthen such a risk-aversion. Or to put it more precisely: Success may lead to promotion and personal satisfaction, but so may *not* taking risks. Failure on the other hand may wreck a career.

Still, Publin could find no proof that the public sector is less innovative than the private sector. In many cases public sector institutions may actually instigate innovation in the private sector, through customer relationships.

Drivers and barriers

The better the actors are at developing networks that can help them get access to relevant competences and partners, the greater are the chances that their innovation processes will succeed.

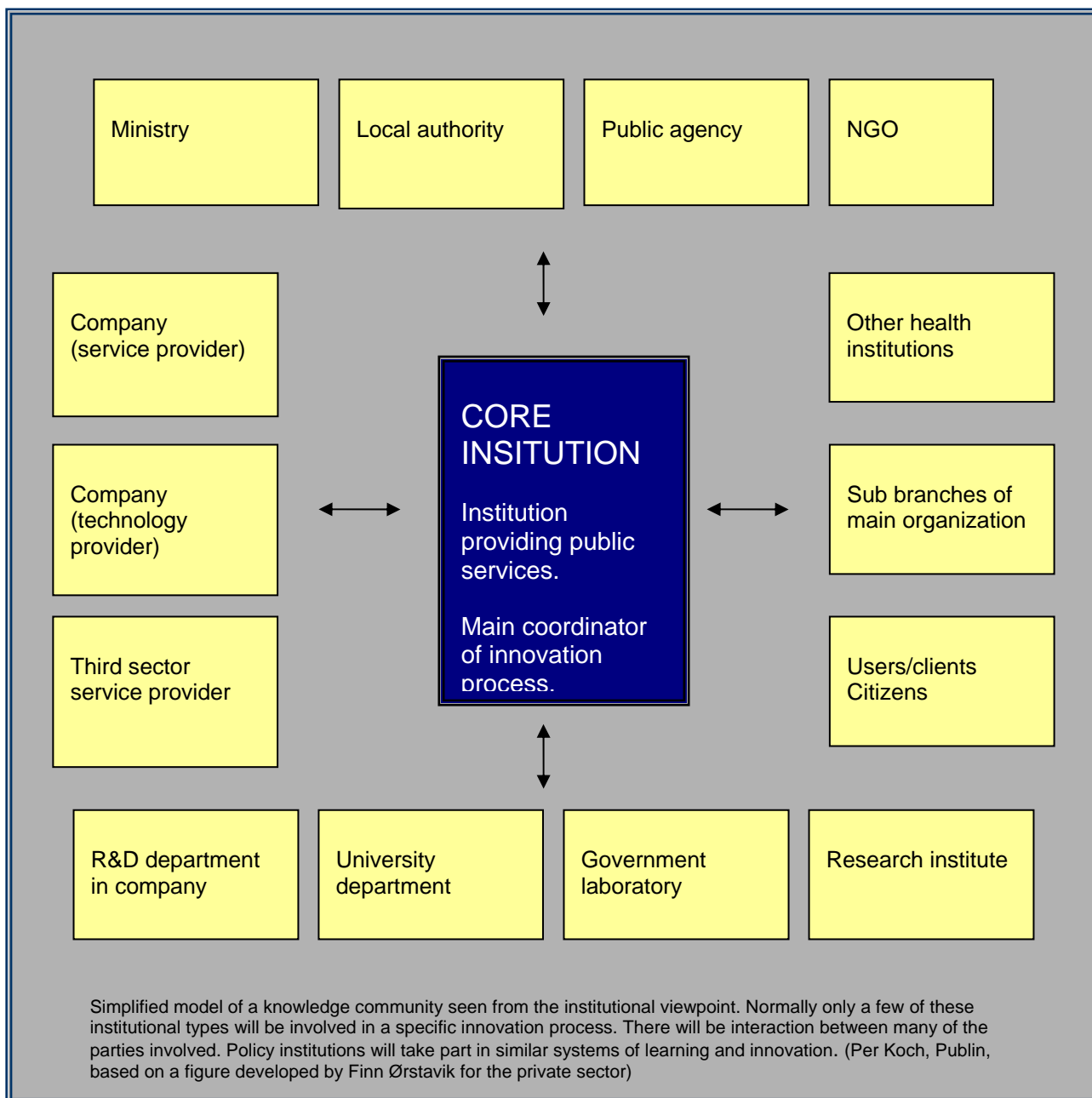
As the Publin research pointed out these innovation networks may be informal, i.e. dependent on individuals working in the public organization. However, these networks may also be used in more systematic innovation processes, where the organization as a whole has decided to start an innovation process aimed at solving a particular problem. This may for instance entail discussions with private companies delivering machinery, equipment or services, and may also in some cases involve research institutions. The figure below is a presentation of an institutional network for learning and innovation.

On the basis of this model Publin stipulates that successful innovation, i.e. innovation processes that leads to a solution to the problem at hand, requires:

- Networks
- Access to relevant in-house competences
- Access to relevant competences outside the organization (networks)
 - In-house competences needed to find, understand and make use of outside competences and technology
- Culture and organization
 - An in-house culture that encourages – or at least allows – such learning and innovation processes
 - An in-house organizational structure that supports such learning and innovation processes

Given that any public organization or unit is part of a larger hierarchy, the last point may be extended to include other organizations in the public sector. The innovative capabilities of a hospital may be strengthened or weakened by policies made by – let's say – the Directorate of Health. Furthermore, the directorate's ability to innovate requires a close interaction with the Ministry of Health. In this respect public institutions differ from private companies, where the chain of command is normally much, much shorter.

Given the systemic nature of innovation, any analysis of the innovative capabilities of public organizations, must take their innovation culture and networking abilities into consideration. We must find out what engenders innovation and what hinders it.



Publin mapped different types of barriers and drivers for innovation, i.e. social phenomena that hinder or encourage innovation activities in such institutions.¹⁵

Among the important barriers to public innovation, Publin listed:

1. *Size and complexity.* The public sector comprises extremely complex and large-scaled organizational entities that may develop internal barriers to innovation.
2. *Heritage and legacy.* Public sector organisations are prone to entrenched practices and procedures.

¹⁵ This set of barriers and drivers was developed by Paul Cunningham of PREST, the University of Manchester. See Publin report D19 *Innovation in the health sector – case study analysis*

3. *Professional resistance.* There are professional groupings with their own communities of practice, rationalities and perspectives.
4. *Risk aversion.* Public organisations are under close scrutiny of both politicians and the media, and employees are not normally rewarded for taking risks.
5. *Need for consultation and unclear outcomes.* The large range of stakeholder involvement generates a strong requirement to consult and review any planned changes.



6. *Pace and scale of change.* There have been so many reforms that employees are becoming “innovation fatigued”.
7. *Absence of capacity for organisational learning.* There may be a lack of structures or mechanisms for the enhancement of organisational learning.
8. *Public resistance to change.* Elements of the public might be risk-averse.
9. *Absence of resources.* There may be a lack of financial support or shortages of relevant skills or other support services.
10. *Technical barriers.* There may be a lack of technological solutions to the problem at hand.

Among the important drivers for innovation Publin drew particular attention to:

1. *Problem-oriented drivers.* People innovate in order to solve certain problems.

2. *Non-problem oriented drivers.* Innovations may improve on the former situation.
3. *Political push.* Strategic change frequently requires strong, top-down, political will.
4. *Growth of a culture of review.* Assessment practices may stimulate innovation.
5. *Support mechanisms for innovation.* Authorities may implement policy measures aimed at funding and encouraging innovation.
6. *Capacity for innovation.* Public employees have often high levels of professional expertise, creativity and problem solving.
7. *Competitive drivers.* Performance targets may encourage the use of innovative approaches.
8. *Technological factors.* Technological innovation can be a strong determinant for subsequent innovation.
9. *NGOs and private companies.* Models developed by NGOs and private companies may be adopted by public institutions.

An innovation policy for the public sector should be aimed at encouraging relevant innovation by building down unnecessary barriers and making use of efficient drivers.

The Interact case studies

Each of the five Interact partners carried out a case study with the intention of studying drivers and barriers in that particular part of the public sector and the national innovation system.

The five case studies were:

- Implementation of electronic prescribing system at the Landspítali-University Hospital, Iceland
By Elvar Örn Arason
- Commitment to public innovation: a case-study of a Copenhagen health care centre
By Lars Fuglsang
- Implementing Electronic Health Records, The Faeroe Islands
By Heini Hátún
- Systemic innovation in Pirkanmaa Hospital District, Coxa joint replacement hospital, Finland
By Niilo Saranummi and Sirkku Kivisaari

- Distributed examination of x-ray images using broad band technology, Norway
By Trond Einar Pedersen
- Following the Road of Innovation? A case study of Berzelius Science Park in Linköping, Sweden
By Karla Anaya-Carlsson and Peter Schilling

The case studies are presented in Inteact report No. 2, *Innovation in the public sector in the Nordic countries, Case studies*, Oslo 2006 (www.step.no/interact).

Iceland: Implementation of an electronic prescribing system at the Landspítali-University Hospital

The Icelandic team took a look at the implementation of an electronic prescription system – the Theriak Medication Management system – in one ward of the Landspítali-University Hospital (LUH) in Iceland.

Electronic prescribing (e-prescribing) refers to the use of computer devices to enter, modify, review, issue and/or transmit medication prescriptions.

The story told by the Icelandic team is a story of problems, especially under the pilot phase, where it was found that lack of ICT support, slow and cumbersome usage, a time consuming sign-in process and inadequate network stability made the participants consider abandoning the project altogether. Improvements were made and the system was implemented in the whole ward. At the moment of writing, however, the system has yet not been implemented in the whole hospital.

Some of the lessons learned from the study are the following:

1. This is an example of public procurement leading to innovation. The main reason behind LUH's decision to collaborate with TM Software was previous collaboration. The integration of this new product required innovation on both side of the public/private divide.
2. This innovation process was influenced by the proposed establishment of the Icelandic Health Database (including the assembly of medical records and the genome for the entire Icelandic population by the company Decode Genetics). The debate and uncertainty that followed led many companies, including TM Software, to move their focus overseas. TM Software's collaboration with e.g. Dutch and Danish companies did stimulate innovation in the company.

The Icelandic report found the following innovation drivers:

1. *Revision of work practice.* The ward did not try to restructure work routines so that the Theriak system was better integrated with the daily practice. The author recommends that a further implementation at LUH should be followed by altered work processes. The work routine can then become a driver, not a barrier, to innovation.



2. *User-involvement.* All stakeholders within the hospital must collaborate to encourage the rapid adoption of electronic prescribing. Heterogeneous users from a variety of wards should be included in the process, and mutual learning between them should be encouraged. However, one cannot and should not ask clinicians to adapt systems that compromise the care for the patients.
3. *The provision of adequate IT support.* Throughout the pilot project, the staff complained of a lack of IT support both from the vendor and the IT department at the hospital. It is vital to recognise that electronic prescribing is a mission-critical process that demands 24 x 7 technical support – especially to begin with.
4. *Appraisals.* Conducting an evaluation of the adoption process and observation of the “real life” try-out give valuable input into the hospital-wide implementation process. The fact that this technology has been tested on Iceland may help the further adaptation of the technology elsewhere. However, this requires a process evaluation with before-and-after testimonies.

At present, not enough resources have been invested in the collection of such evidence at LUH.

5. *Organisational culture.* According to the Icelandic report paying attention to organisational culture and behaviour change management is a critical success factor. Widespread cultural changes should be promulgated, not only among ward staff, but also within the pharmacy and among other units that will either use the information system or be affected by it.

The Icelandic report found the following barriers to innovation:

1. *Professional resistance.* Senior managers and clinical staff were sceptical to the introduction of the new technology. The Icelandic team argues that more emphasis needs to be placed on providing clear-cut evidence of enhanced patient safety, cost reduction and efficiency, thus winning the hearts and minds of the people involved.
2. *Increased time/workload in the beginning.* The Icelandic team argues that appropriate incentives should be deployed before a hospital-wide implementation takes place, since the current workload will increase in the implementation period. Moreover, doctors must be active participants in the implementation process.
3. *Technological emphasis.* Too much emphasis was put on the technical aspects of the implementation process. A system that is technically “perfect” from the beginning may exhibit suboptimal effects when implemented in a clinical environment.
4. *Unpredictable outcomes/risk aversion.* The Icelandic team argues that a contingency plan needs to be developed that takes into account unprecedented incidents, as unexpected failures will occur.
5. *Lack of resources.* Although the Icelandic report does not argue that a lack of resources was an impediment in this process, the author points out that several other pilots in the public sector have been perceived as failures because adequate resources for full implementation were not provided.
6. *Training.* During the implementation period, the staff complained about inadequate training. The training problems are amplified in large hospitals, such as LUH, which have a constant staff turnover. The need for training cannot be exaggerated and should not be under-funded.
7. *Privacy and secrecy.* One of the most common criticisms stated in relation to electronic health records and e-prescribing is the threat to privacy and security. However, the Icelandic author argues that this problem might just as well be considered a driver for innovation, as a well-designed e-prescribing system can be far more secure than the current paper-based system. However, the risk or perceived risk of lax security may discourage innovation.

The Icelandic team argues that there is no clear-cut recipe available for the successful implementation of an information system in health care organisations. The complexity of the socio-technical networks, and the inherent unpredictability of information system implementation within complex organisations, is simply too great. Making implementation susceptible to mutual learning and experimentation can contribute to success.

In general, both the doctors and the nurses are quite satisfied with the outcome of the adoption process at LUH. The largest obstacles in the way of the transition process are the costs of the transition process and the attitudes of professional stakeholders towards the system's introduction. The implementation should be treated as a change management project, where education and training will be crucial.

When limited funds hold back the next-phase rollout following successful piloting, this can lead to a discouragement that ultimately may undermine future innovation in this area. The people who have devoted substantial effort into achieving the objectives of the pilot see their investment, and that of the hospital, is wasted.

Denmark: Innovation in a Copenhagen health centre

The Danish case study covers the creation of a new health care centre for chronic patients, which was created in Copenhagen in 2005. This innovation can be considered a conceptual innovation, leading to a new relationship between patients and the health care system. The patient is to be taught how to take care of her or his own health.

A critical event for the revitalisation of the idea of health care centres, which took place in 2003, was the government's wish to reform local government in Denmark. Thus, in October 2003, the Danish government set down a Commission of Local Government Reform. This commission had an important agenda-setting role of placing the subject of the health care centre on the agenda in a way, which could not be ignored, due to its crucial role in local government reform. Hence, it was, in a sense, an important external source of innovation.

The Commission stressed that health care centres could replace the previous small hospitals, and that different kinds of health care centres already had been established in the buildings of abandoned small hospitals.

Nevertheless, for the Danish general practitioners, the idea of a health care centre as a mini-hospital (following a Finish model) was not attractive: Firstly, it would undermine the business of the general practitioners (who belong to the private sector in Denmark); secondly, it might reduce general practitioners to second rate doctors as the health care centres might be considered second rate hospitals. They were also nervous that the health care centres would become rival entry points into the health care sector, a development favoured by the nurses.

The idea of creating health care centres had been around for several decades. However, the notion of a health care centre was vague and not sufficiently well

defined. It could be a mini-hospital, a walk-in centre, or a place for prevention and rehabilitation. In some versions, the health care centre was seen as a new entry-point into the health service authorized to refer patients to hospitals. In other versions, the doctors remained the gatekeeper to the health service with the authority to refer patients both to the health care centre, to specialist doctors and to hospitals. Another question was whether the general practitioners should participate directly as staff in the health care centre or stay outside.

It was concluded that the health care centres first and foremost were to take care of prevention and rehabilitation issues, and should not become second rate mini-hospitals. General practitioners should continue to be the gatekeepers of health care services. Doctors should not participate as full members or leaders in health care centres, and the health care centres should not in any way become independent entry-points into the health system. Furthermore, doctors working in the primary or secondary health sector should continue to be employed in one and the same operative unit, the region, not be transferred to the municipality.

Health Care Centre Østerbro, as it evolved, was very much in line with these considerations. A project description was worked out during summer 2004 and during the fall of 2004 the health care centre was planned in more detail: Four working groups were set up, one for each of the four main diseases to be treated, comprising medical doctors, general practitioners, nurses, physiotherapists, dietists and others. The director of the health care centre started on January 15 2005 and the centre at Østerbro was opened in Randersgade 60 on April 19th.

This case study provides support for the idea that openness and interaction are central features of innovation commitment also in the public sector. Furthermore, this openness can be understood as both a design characteristic and as something that has to be activated by the use of certain competence attributes of the users and producers of the new service. The following four incidents have been observed that can support this hypothesis:

1. Openness toward demand. According to several sources, the Mayor of health in the city of Copenhagen was very much in support of the idea of the health care centre. She successfully argued that there was a demand for the health care centre. A decision was then made in the town council to proceed with the idea.

2. Openness toward involvement. Civil servants (top management) in the municipality expressed scepticism towards the idea, which they saw as very vague. They tried to qualify the idea further through involvement of various stakeholders. This openness towards involvement is also a design characteristic, since it is normal procedure to involve a range of stakeholders in the creation of public services. But it is also a competence attribute since the civil servants had to be able to identify and engage the relevant stakeholders and make sure they did not obstruct the process.

3. Openness toward entrepreneurship. A centre director was employed. This person was a nurse who was credited as both entrepreneurial and professional, and she also had a record of being patient oriented.

4. *Openness toward co-creation.* Finally openness towards some degree of co-creation among various users and producers was to some extent important. Standards of recruitment were laid out by working groups. Co-creation was a design feature (the working groups), but also dependent on the competences of the users. The centre is, for example, dependent on patients' willingness to meet in the centre and their openness towards learning. This is not unproblematic as the patient is ill.

The Danish report makes the following comments on relevant barriers to innovation in this case:

1. *Size and complexity* is an important barrier in this case, with a pre-existing strongly institutionalised division of labour and distributions of competences.
2. *Heritage and legacy* is also important. We have seen that the actors involved to a large extent have an institutional perspective on change, which means that they to a large extent build on internal resources.
3. *Professional resistance* is also present and can be explained by institutional factors. It is especially rampant among doctors, both medical doctors and general practitioners.



4. *Risk aversion* is also crucial, since it is claimed, for example, that the notion of the health care centre is a weak notion, implying that the risks are high.
5. *Public/political profile and accountability* does not seem to play an important role in this case as a barrier, even though evaluation and accountability are important to the project in the long run.

6. *Need for consultation, and unclear outcome* is not so much a barrier, but more a driver in this case, because the need for consultation in the form of open innovation drives forward the innovation process in a constructive way.
7. *Pace and scale of change* is indeed a problem. When the concept of the health care centre was introduced, no one knew exactly what to do with it.
8. *Public (and end-user) resistance to change* has not been important to this case. If anything, public discourse concerning coordination and quality in health care has been a driver, especially for the Mayor of Health.
9. *Absence of resources* is of course always important, but the necessary resources were allocated to this project through the municipality and the Ministry of Health. One may suspect, however, that for the future, the capacity of this particular health care centre (1,500 patients) will not match the demand (potential users have been estimated to 6,800).

The author makes the following comments on drivers for innovation:

1. *Problem-oriented drivers* have been important. At the same time, the problems were not clear-cut from the beginning. They had to be negotiated. Once an important key problem was identified and solutions were presented, this key problem became an important driver of innovation.
2. *Political push* has been extremely important, in the first place from the government through its Commission of Local Government Reform, and in the second place from the Mayor of Health in Copenhagen, who successfully launched the idea and was willing to take the risk.
3. *Growth of a culture of review* is essential to the public sector in Denmark, but has not been so important in this case. Nevertheless, the review culture will be important in a second phase, where the centre will have to document its results through evaluations.
4. *Support mechanisms for innovation* have been present both in the form of political support (Mayor, government), professional support (from Bispebjerg Hospital), administrative support (the municipality) and financial support (from the municipality and the Ministry of Health).
5. *Capacity for innovation* goes without saying. Much institutional innovation has always taken place in the health sector as a consequence of the scientific approach and professional culture. One problem for this innovation culture is that it increasingly has to consider “open innovation” based on external sources and incentives.
6. *Competitive drivers* have not directly influenced this innovation. Fear of more competition in the health care system has rather been a barrier to innovation.
7. *NGOs and private companies as drivers for innovation* have not directly played a role, even though NGOs are included in the overall centre strategy as potential co-players and competence bases.

The author argues that this study shows how a mixture of openness towards a) demand, b) the involvement of stakeholders, c) social entrepreneurship and d) co-creation of services between users and producers supports innovation.

The Danish researcher furthermore argues that openness and “open innovation” (Chesbrough 2003) is a central feature of innovation in the public sector and not just in the private sector. This openness, when it exists, appears to be both a design characteristic of the public sector and a competence attribute.

Another critical factor in this case is the attempt to maintain a legal and social cohesion in the health care system among the different sub sectors (secondary, primary, and municipality). This cohesion is important for its own sake, but also because innovation is dependent on social cohesion and creativity at the same time. This social cohesion or social order seems harder to achieve under conditions of open innovation than under conditions of institutional innovation (i.e. where an institutional framework is given).

Implementing Electronic Health Records in the Faroes

The Faroese case study looks at the implementation of Electronic Health Records (EHR) in the Faroese health sector. The use of paper based patient journals is the norm at the moment with the exceptions of some General Practitioners (GPs) who are using electronic systems for this purpose.

The main aim of the “Digital Health System - DHS “ measure (Talgild Heilsuskipan-THS) is to bring forth a “cooperative health sector”. System proponents argue that successful use of the system will bring about more holistic effects than “traditional” EHR systems, labelling the platform an Integrated Clinical Workplace.

The DHS is a common information platform intended to support administrative and clinical processes in the health sector as a whole. It entails:

- Integration of different digital health systems in the health sector as a whole (domestically and in Denmark). Integration with other related systems in the social services sector.
- Integration of routines, standards and procedures amongst GPs and hospitals within and across sectors.

The DHS system is to become an access point for all relevant services and health systems and is to be used mutually by all health sector actors. It constitutes one common place for accessing information needed in service provision as well as one common place for entering information related to the services.



The story told by the Faroese team is in many ways the story of a country that is so small that it is hard to develop innovation systems of a critical mass. The policy system is too small, and it is hard for the public sector to find relevant business partners on the islands. The Faroese case may be extreme in this respect, but the other Nordic countries should not take the phenomenon too lightly. All the Nordic countries are small, relatively speaking, and some of the processes we find on the national level in the Faroese Island, may also be found in regional communities elsewhere.

The following are some of the drivers that have played a role in the initiation of the DHS project, according to our Faroese analyst:

1. *Political push.* There is a general attitude in the political environment and amongst user segments that the DHS is a positive project, which may improve health service quality and efficiency. The DHS process marks a change in the ways of working with change in the health sector in general. Traditionally change and innovation has happened in relatively ad hoc manners and in response to external pressures, rather than as a result of long term political planning on the Faroese Islands.
2. *Problem oriented drivers.* The DHS was initiated as an approach to help ongoing efforts succeed in the field of digitalisation of Patient Journals. These had failed due to resistance and inadequate efforts. Moreover, for a long time efforts had been made to integrate the primary and secondary health sectors in a better way through direct organisational change, again without any success.
3. *Support mechanisms for innovation as a driver.* A comprehensive project organisation has been set up to assist the many actors that are working together in the realisation of the project outcomes. However, despite the

efforts it seems that the support mechanisms are insufficient and at times inappropriate given the circumstances.

4. *Small size of society as a driver.* In many respects the small size of society is a barrier in this project, but this condition also has potential positive effects. In logistical and project technical terms it is easier to roll out an ICT system in a smaller user environment, as there are fewer users etc. This is most probably the reason why the ICT strategy set out to implement an infrastructure for one common patient journal and a common backbone for one integrated solution for patient oriented systems. In this sense the small size of society has been a driver, initiating a process that is unique in international terms.
5. *NGOs as drivers.* In terms of the DHS case patient organisations have not had any initiating effect.
6. *Other drivers.* It seems that other drivers (e.g. culture of review, capacity for innovation, competition) are not present in this case.

Barriers in the DHS process:

1. *Limited innovation capacity.* A range of interrelated conditions limit performance. These conditions concern mainly competence levels at the customer and supplier sides. Generally the innovation capacity (including infrastructures for knowledge transfer) in the health sector system is limited. The system has few resources that can be used to work proactively with strategic development projects. For instance: the Central Hospital as an organisation has limited experience in working with complex cross boundary development projects internally; health personnel focus on their occupational tasks. Neither is there any domestic private sector knowledge base to utilise or to interact with. The problem of innovation competence shortages is exacerbated by the complexity of the system, and its abstract nature from the perspective of users.
2. *Small size of society as root cause.* These problems are fundamentally rooted in the small size of society. Important interrelated functions such as policy making at the ministerial level—coupled with strategic long term planning and organisational development performed by top hospital management—are weak or lacking
3. *Capabilities of suppliers.* The performance capabilities of suppliers are limited given the conditions and requirements that apply in the project. The main contractor abroad makes a living out of innovation. Competence levels regarding project work are high and there are wide ranges of systems in use for knowledge sharing internally. However, the main contractor has limited experience in the details of the system being provided. The main contractor is dependent upon the knowledge of a Faroese sub contractor that owns the system, and there as been a lack of communication between the actors about how the subcontractor goes about implementing such systems.

4. *Physical and cultural distance* has added to the problem. Despite the communication and interaction opportunities given by ICT, personal face to face communication may be required to solve and interpret complex issues. This option has been limited in the customer-supplier relation and in internal supplier relations. Furthermore, the combined cultural gap between the user representatives in the project and the main supplier representatives in terms of occupation and nationality has induced confusion in workshops.
5. *Lack of supplier incentives as barrier*. In international and financial terms the project is small. In situations where the supplier must prioritise between different projects, the Faroese projects will often loose out.
6. *Size and complexity*. In relative terms the DHS project is probably the most comprehensive ICT project taking place in the Faeroes. There are various dimensions of complexity to be overcome in the project. Mainly these are 1) technical complexities of integrating many solutions into a common platform and 2) organisational and legal complexity in the user environment. Within this project's organisational context a range of standard methodologies have been used for knowledge gathering and distribution. In many cases though, these structures and methods have been inappropriate and some core activities have been lacking, perhaps due to lack of overview and competence, in the light of complexity.
7. *Professional resistance*. There seems to be a wall between health units and professionals on the one side and the central administration and hospital top management on the other. Actually, there is a physical barrier in the form of a road between the central hospital on the lower side, and the Ministry and Central Hospital top management on the upper side. Health personnel tend to address administration and management as "those on the upper side of the road". The DHS is seen as an administrative system that tilts the power relation between administrators and health care personnel in favour of the former (Mittún 2006). One grouping is the head doctors who historically have been very autonomous and authoritative. Another is the head nurses, who have had rivalries with the medical employee groups. Another is the GPs who generally resist "giving away their journals".

In general there are several hidden power structures in the sector. As one senior policy maker indicated "the hospital is similar to a modern airport in terms of complex interrelationships that need to flow together. At the same time it is governed by tacit rules, like a monastery".

8. *Heritage and legacy*. The National Doctor, Head Doctors and other senior health care actors were previously in charge of both management and health care. Gradually a management function has evolved, and tensions between the two parts have existed ever since. In general health service provision has been characterised by autonomy and lack of integration. GPs have for instance had a status of autonomy and authority in the regions, and have practically owned patient journals. On a continuous basis the regional hospitals have fought against centralisation etc. The project has from the outset focused on thorough change management and the handling of resistance from stakeholders.

9. *Public and end user resistance to change.* The change process is also negatively affected by forces in the outer environment.
10. *Risk aversion.* In general, regulators of public institutions are, according to their task, very focused on “upholding the rules”. In general the health sector is highly regulated both with respect to health professional and administrative matters. In terms of the latter a crisis in the 1980s led to a u-turn in this respect. In the 1980s regulations were generally loose, which some argue was a reason for the economic crisis at the time. Now the national auditor and the Representative keep a strict eye on public sector operations (Køtlum, Balle 2006). Critics argue that a culture of risk aversion has grown gradually, where all actors, those regulated and those regulating focus too much on “keeping their backs free” rather than focusing on holistic improvement of services in accordance with correct practise. The Data Monitor has, for instance, required thorough approvals and guarantees from the project, something that has directly delayed the project.

The negative focus may also have led to negative media attention. In competence terms, the lack of awareness of the need to inform might have exacerbated this problem. Only lately the Minister of Health has been informing the public about the DHS as a response to a call for debate from the Data Regulator.

11. *Lack of financial resources.* The project is struggling with resource problems caused by financial shortages. According to participants the estimation of the project was unrealistic (10 million DKr) and the project has suffered from this from the outset. Hospital top management argues that a lot more is needed in order to implement the solution according to the rough plan that currently applies. Many of the project activities have been hampered by manpower/competence shortages at all levels.

Despite the relatively systematic approach change efforts have been insufficient causing problems in the innovation process. The main problems are:

- Lack of clarity about what is expected from the system.
- Confusion in the development process experienced in the project environment.
- Delays caused by external influences and internal resistance.
- Uncertainties concerning the full implementation of the DHS in the health sector as a whole.

The health policy system is in general weak. Due to lack of policy functions/mechanisms and resources in terms of finance and knowledge there is a lack of general health policy and specifically health innovation policy,. There is a lack of health related R&D and the policy and the health service systems have no domestic private health sector to co-operate with.

Moreover, there is a lack of critical mass to support the nurturing of knowledge e.g. regarding specialist medical treatments, the management of innovation, management of the public private interaction etc.

Finland: Systemic innovation in Pirkanmaa Hospital District, Coxa joint replacement hospital

The Finish Interact case study focuses on systemic innovation processes within the Pirkanmaa hospital district (PHD) in 2004-06. In this study systemic innovation refers to a simultaneous redefining of boundaries of service provider organisations, the development of new kinds of services, and the application of new technology. In a nutshell it refers to change in “the mode of operation” or “business model”. The PHD is one of the 20 largest hospital districts in Finland and it is considered to be the forerunner in systemic innovation within Finnish specialised health.

The systemic innovation under study is the renewal of joint replacement processes within the PHD. From the organisation’s point of view, it is a case of outsourcing joint replacement surgery to a company. From the patient’s point of view, the case represents a change towards patient-centricity and continuity of care across organizational boundaries. The innovation process under study took place in the early 2000s, i.e. just before national policy decisions were made to renew the health care system.



Since the late 1990s, the PHD management has sought to gain scale advantages with structural rearrangements. The renewal process was started by regional reorganisation of laboratory services in 1999 and continued through the outsourcing of joint replacement surgery from the PHD

to a company servicing patients in 2001.

The moving of the joint replacement surgery into the Coxa hospital has clearly led to quality improvements. The follow-up data indicates that infections following operations have fallen dramatically. The number of patients requiring renewed surgeries has decreased. Hospital stays have been shortened.

All this was enabled by Coxa’s renewed process flows and by changes that were made in the rehabilitation processes in publicly owned primary health care centres. Additionally, national comparative studies have indicated that work satisfaction in Coxa and customers’ satisfaction with Coxa’s services are outstanding.

In spite of these unquestionable benefits there are also some unsolved issues. The initial idea was that Coxa would sell its services nationally and even internationally. However until the end of 2005 Coxa has sold most of its services (79 %) to the PHD and the use of its services in other regions is only slowly growing. The international markets have not yet been established.

The diffusion of Coxa services and its operation model outside the PHD is an issue that has gained more attention in the recent ownership rearrangement. Originally, the ownership of Coxa was divided between the PHD (35 %), City of Tampere (20 %), a private German hospital, Wittgensteiner Kliniken Ag (20 %), a private Finnish hospital, Orton (5 %) and four Pirkanmaa municipalities (5 % each). In 2005, when the foreign owner was no longer interested in Coxa, it sold its shares to Sitra, a Finnish investment trust. Sitra is interested in promoting diffusion of the Coxa model in the whole Finnish health care system.

This case study revealed various critical incidents that have influenced the development and diffusion of the innovation. First of all, the critical incidents incorporate new key persons taking office in the corporate management team. Their complementary management skills and characters provided a fruitful basis for intensified management training, renewal of management tools and systems, experimentation, and strategic dialogue needed for backing the reform. Secondly, a national study revealing problems in endoprosthetic surgery conventions made it possible to realize a regional reform that had already been planned, by decreasing potential resistance to change.

Additionally, some critical incidents have encouraged diffusion of Coxa's services. Firstly, the recent amendments in legislation obliged the municipalities to place more orders for endoprosthetic surgeries to shorten the patient queues. However, municipalities in Pirkanmaa did not take action before they received unfavourable publicity from the Ministry of Social Affairs and Health's monitoring review. Additionally a potential critical incident may be the entrance of Sitra, the Finnish venture capital organisation, to Coxa's ownership and management. As mentioned, Sitra aims to promote national diffusion of Coxa operation model.

In relation to the innovation environment, the study supports many of the findings of the Publin study. In health care, innovation is hampered by the complexity and large size of the organisations and the decision-making systems. However, in spite of these obstacles, skilful management may be able to implement innovation processes. In this connection the ability to create and maintain a strategic conversation with all stakeholders is paramount. As regards Publin's list of barriers to innovations the Finish team made the following observations:

1. *The large size and complexity of organisations.* Despite the fact that the PHD is one of the largest hospital districts in Finland it was able to generate systemic innovations and act as a pioneer in specialised health care system renewal. In this case some advantages of large size became visible. The great number of highly qualified personnel provided a good source of innovative ideas and skills to implement them. With competent management, even large complex organisations in health care can induce and implement change.

2. *Large range of stakeholder involvement.* The PHD study revealed that all decisions have to be based on consensus in this complex system of multiple actors. It also indicated that small minorities can block initiatives if there are no strong quantitative facts available for convincing all stakeholders of the necessity of change.
3. The “*not invented here*” attitude. It has been claimed that each organisation tends to consider its operations so unique that successful solutions developed elsewhere are “not implementable here”. This attitude was also present in the PHD case: New ideas were adopted but their implementation was always founded on in-house expertise. The drawback is that if each organisation develops solutions from scratch by itself and builds its own competence and skill base, there is no knowledge transfer. This results in “reinventing the wheel” several times without making use of the lessons of previous implementations.
4. *Professional resistance* was among the barriers both in Publin and in this case. Doctors and managers have different approaches to issues such as accountability, use of guidelines and finance. These differences are based on their professional education and training, beliefs, and experiences. In the case study professional resistance occurred but it was managed by committing recognized professionals to champion the change processes.
5. The *absence of resources* has been referred to as a barrier for innovation in health care. This is the case in many hospital districts in Finland (Kivisaari & Saranummi 2006). In the PHD, R&D activities were closely linked to strategy and sufficient funding for these activities was provided.

The Finish report highlights some aspects which were not pointed out by Publin, but which were indicated as barriers for innovation in this case study.

6. One of them relates to the usual *lack of objective, quantitative data*, which could be used to compare regional differences in the quality and costs of joint replacement surgery processes. In this case, the management was able to get quantitative data to justify the need for change to elected officials and municipalities. Without being authorized by decision-making bodies, management could not have started implementing change.
7. The second barrier relates to *professionals’ cliques that resist change* when it goes against their interests. Even in cases where the change would be beneficial for the society as a whole powerful cliques can turn it down. This aspect seems to be related to the slow diffusion of the Coxa model. While the Coxa orthopaedists are pleased with their good employment terms and possibilities to specialize in joint replacements, the less specialised orthopaedists in other hospitals feel less fortunate and manifest some envy towards the Coxa orthopaedists. Some leading orthopaedists reject diffusion of the Coxa model to other regions because it tends to divide orthopaedists to two “classes”.
8. And finally, the study points out the underdeveloped *supply of and demand for expert services* supporting innovative activities and diffusion of innovations.

The case indicated that building and using in-house expert services for change processes was a strategic choice of the PHD management. Their arguments favouring in-house expert services were based on the fact that an organisation of the size and type of the PHD inherently has a lot of knowledge and competence in its personnel, who are highly interested in further developing their competence (“curiosity driven professional organisation”). Another justification was the fact that the changes were so demanding and of such a long duration that in-house expertise for change management and implementation of new ideas needed to be cultivated. This preference of sticking to in-house expertise is typical of health care. Its disadvantage is the fact that every health care organisation develops its own solutions from the idea to implementation to practice and do not make use of the experience of others. Additionally it is expensive.

As to **drivers** for innovation the Publin study refers to problem-oriented drivers, political push, increasing assessment practices, support mechanisms for innovation, capacity for innovation, and competitive drivers.

1. The PHD case is a good manifestation of the *problem-oriented nature* of innovation in health care. The renewal process was related to the more general concern on future availability of high quality services for the ageing population and the strive for better cost effectiveness. The political push for such changes was also strong.
2. *Competitive drivers*. This case indicated that competitive incentives are often missing. For instance, the business idea of the Coxa Hospital is to sell its services also to hospital districts and municipalities outside the PHD. It seems that there are not strong enough incentives for them to purchase joint replacements from outside. Even if Coxa can make a case for better quality of joint replacement surgeries with less cost, the potential purchaser (municipality) of Coxa services faces a difficult decision. In most cases the purchaser has in-house services for joint replacement surgery. The decision to buy or not to buy has implications for the in-house capabilities. One has to remember that health care is today a “zero sum game”. If joint replacements are bought from outside then that money goes outside and savings of the same size have to be found internally. Again, the lack of objective indicators means that it is not easy to argue for such changes.
3. The *assessment practices* and *benchmarking activities* have been increasing over the years. At least in theory they could promote a culture of organisational learning (Cunningham 2005). The assessment practices were, however, criticised for lacking constructive orientation. The problem with many benchmarking activities is still, that the indicators in use are not always comparable.

The study raises the question of how to strike a balance between the use of in-house expertise and external services. The encouragement and development of internal expertise is expected to lead to organisational learning. The encouragement and development of external, public or private, expert services should, on the other hand,

lead to knowledge transfer and diffusion of innovations. The question is whether there is an optimal mix of internal and external expert services.

There are two issues that should be considered in this context. First, systemic innovation is a process that takes place inside an organisation and has to be led by internal resources. Using in-house resources for problem solving and implementation leads to organisational learning and the organisation will be better positioned against competition and changes in the market.

Secondly, the requirement for internal leadership does not, however, exclude the use of external expert services to facilitate the change process. What services the organisation decides to use depends, of course, on what is available and what services it needs to complement its internal capabilities with. The question of what is available creates the “chicken and egg” problem. If there is no demand for expert services there is probably no supply either. And as a corollary there are no market conditions for such expert services to be created and maintained external to the organisation and therefore the organisation itself is always more capable than outside services. The only way to end this dilemma is for the organisation to make its expertise available to the outside.

The study indicated that currently ideas and experiences are freely exchanged in conferences and other meetings between health care organisations, but that no single organisation has the position, interest or incentive to promote similar change processes in other organisations. Should the “promoter” be an external neutral actor or the innovator? The innovator would probably benefit from being involved in the knowledge transfer process. After all, it has been claimed that mastering something comes from a combination of doing it yourself and teaching others how to do it.



Norway: Digital x-rays: Distributed examination of x-ray images using broad band technology

The Regional Health Enterprise Mid Norway (Helse Midt Norge) has during the last years invested in digital x-rays and broadband communication between the many health actors in the region. All eight hospitals in the region have now introduced and started to use a common PACS/RIS system (x-ray images and patient information system) based on broadband technology.

It is not the production of the X-ray or MR (magnetic resonance) images that make up the main bottleneck in this case study. It is rather the professional assessment, evaluation, judgment of the pictures which in turn of course enable a fast diagnosis of potentially severe illnesses. The background for this is the fact that there is not enough expertise within the Norwegian system. There is an acute lack of x-ray doctors in Norway, in particular experts and specialists with competence (radiologists) that can make diagnoses of x-ray and MR pictures, in particular in relation to the application of Magnetic Resonance (MR) technology.

The regional health enterprise wanted to initiate a project which would make use of an existing and tested technology within image diagnostics and broadband communication. The objective has been to be able to offer better x-ray and MR diagnostics services. The project was to realize economic and qualitative gains. The economic gains would particularly be connected to a more efficient use of manpower and machinery in the x-ray departments of the hospitals.

Almost all the hospitals in the Mid Norway region have MR-machines, but the hospitals lack sufficient competences at the individual hospital to be able to examine the images. MR is the preferable as the patients avoid dangerous x-ray irradiation.

However, examination of MR images requires specialist competences, and it takes time and money to build up such an expertise. The hospitals do not have enough human resources in this area, particularly if they are to maintain a 24 hour service. Diagnostics based on MR images using broadband technology would increase this capacity and make a 24 hour service for all the participating hospitals possible, to the best for the patients.

The hospitals participating in the project are the Namsos Hospital, Levanger Hospital and St. Olav Hospital.

The idea has been to use broad band technology to send MR and mammography images to experts abroad. Two solutions were considered, presented, tested, analyzed and evaluated:

Solution 1 (the Swedish solution): Swedish doctors with the right competences were engaged, at first commuting between Sweden and Norway, and then offered the possibility to do “distant diagnostics” from Sweden, but as employees of the Norwegian institution.

Solution 2 (the Barcelona solution): A large private health care company in Spain could do diagnostics; they could also offer courses and transfer of competence within diagnostics of MR x-ray to the Norwegian health service.

Many of the objectives given were reached in this project. In the opinion of the project leadership of the technical supplier, however, the project can only partly be called a success.

Increased capacity. The distributed examination of x-rays using broad band was to compensate for the lack of internal specialists at the hospitals. The project should provide the hospitals with the necessary capacity to offer good services to the patients. The hospitals have tested and confirmed that it is possible to make use of important competences using broad band.



Improved quality. The public has got a good quality service.

Improved and more dirigible economy. The project has paid off economically. The hospitals have been able to purchase necessary services to a price agreed upon and has not had to hire expensive foreign substitute physicians.

Publicity/learning. The project has received attention from several countries, amongst others the EU project Baltic eHealth.

As regards barriers to innovation the case study report points to the following factors:

1. *Size and complexity* make it harder to implement innovation, especially in a context with many interest groups and conflicting objectives. This has been the case also in this project.

2. *Professional resistance.* This case demonstrates that a strong interest group like the doctors, who also has administrative responsibility in departments of hospitals, seems to be able to influence the outcome of such projects in a fundamental way.
3. One source of professional resistance may arguably be *risk aversion*: There may be an understandable inherent resistance (particularly of the medical professions) to undertake changes, which may result in an increased probability of risk (to the patients in their care or to the other recipients of their services).
4. There is a possibility that *public/political profile and accountability* is important in this case as well. Public service managers and politicians are very wary of enacting changes that may result in negative outcomes, particularly if these attract media attention.
5. This process may lead to a slow *pace and scale in terms of change*. This case is in particular a case of implementation of New Public Management approaches, which in many public administrations, for a variety of political and policy reasons, are perceived as negative.
6. Although we do not have sufficient information about it, this case may also point to a lack of structures and mechanisms for organizational learning, exacerbated by scale and complexity. This has to do with *capacity for organizational learning (at all levels)*: How is the diffusion of good practice managed? Frequent reorganizations will also promote a lack of corporate memory. This problem can operate at all levels from the top of the policy-making hierarchy down to the service delivery level.
7. *Public (and end-user) resistance to change.* There is an assumed general resistance of the public to reorganization and changes in the way healthcare and other public services are delivered, although this has not necessarily been a significant barrier in this case.
8. *Technological barriers.* The security challenges in the project have been perhaps the most difficult problem. Helse Midt-Norge required that the supplier of the PACS/RIS system must come up with a satisfactory security system making sure that the health personnel only got access to the patient information for which they had clearance. In the Barcelona solution the Spanish clinic gets no direct access to the data systems of the hospitals. The clinic only gets the relevant images sent by broadband. All patient information anonymised and substituted by a unique examination number for each x-ray/MR examination. The security arrangements involve more work at each side, including a cut and paste function by a secretary, with the accompanied possibility to connect information incorrectly. In the Swedish solution all three affiliated specialists, who are working in Sweden, are employed by Helse Nord-Trøndelag. They therefore have the same access rights as if they were present at the hospitals.

The Norwegian report notes that in this case that technology and business related drivers are the most pronounced. The Norwegian researcher then goes on to make the following general observations:

1. *Technological drivers.* The technological barriers mentioned above can also be interpreted as technological drivers: They do make the implementation of the technology harder, but by providing solutions to these problems, the participants also demonstrate ability for innovation. In general the whole project is a result of innovation in the ICT area, including the digitalisation of images and broadband data transfer.
1. *Problem-oriented drivers.* It is clear that this innovation was introduced in response to one or more problems. The main problem was the lack of doctors with x-ray expertise. Typical underlying causes were waiting lists and high costs and the need for providing patients with the best possible service. The public health sector in Norway is facing fundamental challenges in terms of organization and operation. There continue to be waiting lists for patients and all regional health enterprises (which own, organize and run the many hospitals in each region) face annual deficits.
2. *Political push.* The health sector is high on the political agenda, and the problems listed in the previous paragraph has led to a top-down demand for change, including the higher quality of services, cost savings and increased efficiency. This telemedicine project has also depended on *support mechanisms for innovation*, namely a specific policy instrument for implementation and diffusion of IT in society (HØYKOM).
3. *Capacity for innovation* is also present as factor: The staff in the public health system is certainly able to do this with their high levels of professional expertise, exhibiting a high level of creativity and problem solving.

The management and advisors in the Regional Health Enterprise Mid-Norway are in the position to push for what they consider the most appropriate, professional and cost-effective solution. In their opinion this entails outsourcing to a professional supplier.

The hospital managers' and doctors' perspective is the maintenance of competence and intimate customer relations *within* the existing hospitals. This perspective implies that doctors should to do everything they can to build up internal competence in Norwegian hospitals.

Both arguments are understandable: The structural development of health care in Norway has led to some hospitals being closed down. This has mainly applied to smaller, regional/local hospitals. The hospital managers and doctors fear this development and one way of working against the closing of hospitals is to make sure that the hospital has vital functions and vital/expert competence internally. Seen from this perspective an outsourcing of image diagnosis is to go in the wrong direction. On the other hand locally based diagnostic systems lead to a lot of duplication of efforts and the need to maintain top experts at all locations. This is very costly.

As in the Finish case there is also another dilemma. If the interpretation of the image is made by the patient's doctor, he or she may have a clearer idea of what to look for in the pictures. A "centralised broadband expert" on the other hand, will work more intensely on image interpretation and may therefore be able to find irregularities not found by the local expert. In other words: No solutions are perfect in this case.

Sweden: A case study of Berzelius Science Park in Linköping

One of the main challenges of the East Gothia region in Sweden is getting a diversified industrial structure. This is maybe most acute in the city of Linköping since SAAB have been the dominant industry for a long period and focused its activities on mainly military technology and civil aircraft. SAAB has tried diversifying and spinning-out medical technology since the 1960s and 1970s, unfortunately without success.

The science park (Mjärdevi Science Park) that was established by the University of Linköping in the 1980s focused on IT companies. The idea of making medical technology a platform for renewal was not revisited until the end of the 1990s. Then it was put forward (again) not as a solution to SAAB's problem but as a strategy to beat the recession of the 1990s. The recession brought governmental reforms, decentralisation and budget cuts. This process hit the public sector hard, especially in the field of health care.

East Gothia County Council wanted a science park that could create a new information technological sector linked to the medical industry. In the long run a science park should also strengthen healthcare and research. It could also be that the science park was seen as a long-term investment to increase fiscal revenues and jobs, and might also have been used by the County council as short-term way to address a public relation problem.



By taking the results from the University Science Park a bit further the County Council suggested cooperation between the University hospital and the University. Hence, a network between the representatives of the Faculty of Health, the University Hospital administrators and personnel of the East Gothia County Council was created.

Having established the idea, and having found some public funding the East Gothia County Council decided to set up the Hospital Science Park. This type of activity was new to the council and by hiring experts in regional development the science park development also got a professional backing. The actual park had already from the start a professional manager recruited from industry.

On March 15th 1998 the Science Park had become Jöns Jacob Berzelius Science Park AB (BSP) – a limited company mutually owned by East Gothia County Council, Linköping Municipality, Linköping University and the Technology Transfer Link Foundation.

The expectation from the owners was that the Science Park should not only include an incubator but also a network of lawyers, a patent administrator, technical consultants, public relations companies and market research consultants. In addition the park should, via the engineers and medical research faculty, benefit from research that was both entrepreneurial and “basic” (Feldman, *fc*, p 23).

In operationalising the owners’ expectations the park stated its vision as:

“Supporting entrepreneurs all the way from business idea to commercial success and attracting existing medical and technology intensive companies” (Affärsplan 2001, p 3-5).

In addition, three aims were set for the park. Firstly, the objective was to develop BSP itself. Secondly, it was to develop new projects and spin-off companies and assist them from an innovative idea to an established company in the region. Thirdly, the park should attract already successful companies, in the medicine and medical technology business area and launch their activities in the region.

The innovation in this case was choosing *not* to follow the traditional way, namely to ask the national government for money, but to try to make a long term commitment in the region with regional resources. In this perspective the making of BSP was an idea to save the public sector via long-term economic development of the region. At the same time, at an operational level, the idea of realising market models was in our Swedish researcher’s opinion made real by turning BSP into a limited company instead of putting it in the public sector as e.g. as a subdivision. However, making it a company fits pretty well with the demands of efficiency and effectiveness of the dominant philosophy of New Public Management.

During the first four years of BSP operations many ideas arose from different innovators and quite a few companies expressed an interest in working at BSP. Some companies at BSP became too large for the park. Thus the infrastructure hampered the development of BSP. From BSP’s point of view the first years as a Science Park brought good results – a lot of activities, new companies, interesting networks and a physical building that seems too small only after four years. The results were impressive, but it seems that the owners started to question whether their investment was reaching their main objective: regional development.

A great number of ideas did not make it through the BSP model i.e. the ideas were not suited for commercialization. 20 innovative ideas gave birth to companies the first three years. Others were transferred to companies interested in them.

Another problem was the cultural and employment divide between medical researchers on the one hand and business entrepreneurs on the other hand. That division was a real obstacle for innovation in the beginning of the period, but the park could despite this hindrance produce ideas and new companies.

In 2003 the County Council, the Municipality and the director of the Linköping University had a meeting where they decided to move the BSP to Mjärdevi Science Park. With that decision the County Council also gave the administration of BSP to

the Municipality. The main reasons were to reduce administrative costs (patent lawyers, marketing etc) and solve the problem of space.

The decision to move BSP was problematic. There were several reasons why the BSP concept could not be incorporated in the Mjärdevi Science Park. Firstly, Mjärdevi Science Park did not have an appropriate infrastructure for medical activities. Secondly, the proximity to the University Hospital was lost. Some of the interviewees argue that it was the most important element for the development of medicine and medical technology in particular since the competence and the new ideas came from the hospital. In addition, the established companies did not move to Mjärdevi Science Park because it is five kilometres away from the Linköping University Hospital. The proximity argument is also supported by the fact that companies that started at BSP and moved away from the park, moved to buildings close to the University Hospital.

This development meant that the BSP role as a hospital science park was over. However, the Berzelius Science Park's building has kept the BSP name and consists in an office block with seven companies as tenants. These companies have still an interest in medicine and medical technology but the BSP concept as incubator has passed.

In many ways this is the tale of an innovation policy failure. One reason for this failure was the gap between the county's objectives – regional development – and the achievements made by the park.

The County council hired private sector entrepreneurs to run the park. This meant that this public innovation was based on private sector entrepreneurship experience. The entrepreneurs were responsible for the collaboration between the stakeholders and for generating public venture capital. The CEO of the park was also hired for his private sector competences. When the process had come this far, these new public sector entrepreneurs developed a feeling of ownership to the park. As owners, they disagreed with the overall mission and commitment to investment.

In addition to the less than optimal relationship between the owners and the park, the next problematic step in the process was getting something out of the park. Van de Ven argues that economic performance, whether it is actual or potential, is crucial when moving innovation processes to the next step in the innovation process. From the owners' perspective BSP did not perform well enough. That is on the one hand predictable since the owners themselves did not agree on what good performance should be. On the other hand the actual performance of BSP, creating 20 companies and numerous marketing activities and not losing money after only five years must be considered pretty good.

However, the owners stayed true to their original idea of creating jobs in the region. That target was not reached by BSP, at least not to the extent that the owners hoped for. Having other objectives like efficiency and effectiveness as goals for their operations they followed the innovation journey: when an innovation is deemed not efficient—or does not perform on target – it can and in most cases will be terminated.

There are differences between the private and public sector when it comes to entrepreneurial relationships and the role of new ideas. This study shows that there are

at least two types of entrepreneurial behaviour. At the very beginning of the innovation journey the public sector had to hire one type of entrepreneur in order to get innovation going. However, as soon as BSP had become an economic actor in its own right, the public sector entrepreneurs are expected to act as owners and behave accordingly. This change in role also changed the relationship between the owners and the entrepreneur at BSP. In the start up period they were working together. Now they had switched to a relationship where the owner pushed for results rather than being a facilitator.

The change of roles is even more problematic when it comes to measuring the results of the innovation and putting them into the development framework. The original idea was to use the park to develop the region. Interested public sector parties were committed to the idea and brought in their own resources. When the journey began they disagreed on how to reach their objective. To us it seems as if it was their commitment to New Public Management that brought them together in terminating the BSP. This can be interpreted to mean that this new management ideology has problems dealing with development and innovation, processes that require change and adaptation.

This case study does not lend itself so easily to an analysis based on a wide set of drivers and barriers. However, some drivers are apparent:

1. *Problem oriented drivers and political needs.* In this case study the main driver for innovation seems to be the policy need for regional development, and in particular employment on the political level and the wish to create new profitable knowledge based businesses on the other. These two sets of objectives may seem identical, but it turned out they were not. The new companies did not lead to the growth in employment as the policy makers had envisaged.
2. *Ideological drivers.* The innovation was based on the idea that medical university research could be used to generate new industrial activities and thus create new companies and jobs.
3. *Support mechanisms for innovation.* Science parks continue to be considered useful policy tools for public-private interaction.
4. *Capacity for innovation.* Publin argued that civil servants and public employees may have a high capacity for innovation due to their competences. In this case the county decided that they did not have the competences needed and hired entrepreneurs and leaders from the private sector.

As regards barriers, the following comes to mind:

1. *Heritage and legacy.* One could argue that the concept died not because of economic failure, but because the public owners did not manage to change their objectives.
2. The conflict between the science park management and the owners could also be interpreted as an effect of incompatible *belief systems*.

3. *Ideological lock-in.* Our Swedish researchers indicate that authorities adhering too closely to the popular New Public Management philosophy could have caused the failure. Although NPM is based on private market models, it might have become too inflexible in this case.

What we have learned

Innovation is learning

It is fair to say that the Interact case studies in many respects confirm the main lessons from Publin. The main problem as regards innovation in the public sector seems to be with learning, coordination and interaction.

Innovation is about human beings and their ability to change and adapt to shifting circumstances. This ability to change depends on an ability to learn, and the ability to learn requires relevant existing competences and access to other people that have the necessary new competences and technologies. This may sound naïve and self-evident, but as both Publin and Interact has demonstrated, it is not.

It is self-evident that institutions that lack the internal competences needed to implement a new technology or new practice will fail. However, it is equally true that institutions or units that lack the necessary skills to interact with service and technology providers also will fail.

Innovation in the public sector is often a matter of using technologies or services developed elsewhere, but in order for the public sector institution to be able to commission and make use of these technologies or services, they need a minimum of competences to be used in interaction with the relevant suppliers, for identifying the features needed and to check the quality of the products offered. This means that the public institution cannot solely rely on the competences of the supplier in this context.

Secondly, the competences needed are not static. Yes, the institutions need people with the knowledge necessary to interact with the suppliers, but they also need to know how to learn, or how to take part in learning processes involving several partners.

Public private partnership and public procurement

Innovation based on interaction with parties outside the organisation is not always a linear process where the (private) supplier delivers technology and knowledge and the public institution adapts this knowledge to its own needs. It may be, if we are talking about acquiring standard off-the-shelf computers or chairs, but it is certainly not if we are discussing modern technologies as described in many of our case studies.

The examples of public private partnerships we have found here are rather examples of learning processes where the innovation is the end product of a process where both parties contribute. The Icelandic, Faroese and the Norwegian cases demonstrate, for instance, how the development of information technology for hospitals requires competent public institutions with clear ideas about product specifications.

In these cases there is no clear dividing line between public and private innovation. This insight should also have repercussions for innovation policies targeting the private sector. There is now an increasing interest in innovation policy circles for using public procurement as a tool for encouraging innovation in companies. Indeed, public procurement can be used for that purpose. It is, however, important to keep in mind that such policies should not be reduced to a new way of subsidising private enterprise innovation, or – for that matter – ensuring an ample supply of useful “things” to be used in public institutions. Public procurement policies should rather be used to strengthen collaborative innovation efforts that serve companies as well as public institutions. Such efforts will generate learning that will have an effect far beyond the implementation of this or that particular new product, process or service.

People skills

The Publin and Interact case studies demonstrate the need for people skills in innovative organisations, public as well as private. Human beings are not hyper-rational robots that can be programmed with neat flow charts to do whatever you want them to do. They have their own experiences and their own agendas. They have their own belief systems and their own prejudices, and they will – often for good reasons – be critical and sceptical when new changes and reforms are presented.



This means that politicians, policy makers and managers need to know something about the human psyche in general and the local culture in particular in order to succeed innovation-wise.

The chance of success is much better if the people involved understand and accept that this is a good

reform, and that it also – ultimately – will benefit them. This is particularly important if the local culture is characterised by conflicts between different professional groups, like managers vs. health personnel, nurses vs. doctors, and where some of these groups have lost in previous power struggles.

There is several ways of building trust, stakeholder involvement being one of them. It may take more time, but if professional groups and employees are involved in the innovation process, and they understand that their ideas and grievances are taken seriously by the management, their resistance to change may be reduced. If the resistance continues to be strong, it is – maybe – time to take the innovative idea back to the drawing board. The resistance may, after all, be based on legitimate and knowledge based concerns.

It should also be noted that both the Publin and Interact research confirm the lesson that documentation of positive effects will help getting employees on board. Hence, examples of successful implementation elsewhere may help, as will pilot studies where the professional groups have been actively involved.

Bottom-up public innovation

Many of us continue to have an image of the public sector as a mindless bureaucracy, in the same way some people continue to picture industry as something out of Charlie Chaplin's *Modern Times*.

Many civil servants continue to be bureaucrats in the traditional sense of the word, and many of them *have* to be so in order to ensure control of public expenditure and a fair and equal treatment of all citizens.



Still, the public sector, in the same way as industry, is changing rapidly. The educational levels in both the private and the public sector are going up, and both public and private institutions demand more of their employees in the way of flexibility, responsibility and initiative.

Hence the modern civil servant may be overworked, but the chances of becoming only an alienated peg in a Kafka-like machinery is somewhat reduced. This should mean that the potential for bottom-up innovation in

the public sector is greatly increased. There are a large number of highly educated and highly skilled people here that may come up with new solutions to old problems if they are allowed to do so.

This means that the public institutions should work hard to develop framework conditions that encourage the growth of entrepreneurship in the public institutions. Management should find ways of rewarding employees that come up with new ideas and new ways of doing thing. Increased salaries and good career prospects may help, but just as important is the option of giving the entrepreneurs more time and resources to develop their own ideas. Flexibility is the key, which also means that local management must be given the leeway necessary to help local entrepreneurs.

The innovative capability of public institutions is also dependent on local recruitment policies, i.e. the management's ability to identify and hire entrepreneurs and other people with the skills necessary for the organisation to be open minded and flexible.

Given that many managers often play it safe and tend to hire clones of themselves, this might prove difficult in some cases. The silo effect reported by Publin is often based on a kind of mental lock-in, where organisations not only employ people sharing the same beliefs as the existing staff: There are also social mechanisms in place that ensures that the newcomers gradually adapt to the same environment. It takes an open minded and experienced manager to handle and appreciate people who think outside the box – i.e. who sees an innovation champion where others smell a troublemaker.

This being said, there is probably a need for a word of warning. Flexibility and innovation have become popular buzzwords in the management literature, and one may get the impression that what the world needs is more hyperactive and extrovert generalist with no sense of commitment. The public sector has many objectives, and some of them rely on other personal abilities than flexibility and creativity. Thoroughness and reliability are also talents to be valued. Hence our main recommendation here must be for the public institutions to develop teams that combine the ability to innovate with more traditional bureaucratic skills.

Handling large organisational structures

We are facing some really big institutional structures here, structures that are very demanding governance wise. There are limits to how many people and how many rules and regulations any single individual can take into consideration at one time, and the necessary division of labour inevitably leads to learning gaps: i.e. lack of transparency and knowledge transfer.



Ironically sometimes the very innovations that are implemented to solve these problems may engender new ones. New Public Management techniques – including management by objectives – are, for instance, normally introduced to achieve two goals: (1) to get a transparent systems that makes the participants aware of his and her obligations and help them keep track of their deliveries and (2) as a control mechanism that helps their superiors control that these deliveries are met (i.e. that “the taxpayers get their money worth”). These are both fair and necessary objectives.

On the other hand these very control mechanisms are so time-consuming that they leave little time for “creative free time” and innovation. Moreover, if the objectives are already defined and you and your institution are rewarded for achieving these objectives, there is little incentive for

developing new ways of doing things – in essence defining new objectives that generate more work, work not rewarded in the current system.

In other words: Many New Public Management techniques may become static and backward looking, while innovation requires a system that encourages people to think outside the box. NPM is often that box.

That being said, there is nothing in Publin and Interact that indicates that it is impossible to combine the necessary control mechanisms with the flexibility needed to achieve innovation. For instance: If management and their superiors are conscious of the need for innovation, it is often possible to give the most creative employees the room needed to innovate. However, there is a need for an acute awareness of the problem and some sort of funding, either in real money or in the allotment of working time (which, in essence, is the same).

Measuring public innovation

This still leaves the problem of legitimizing such innovation processes, as we have no easy way of measuring the effects of innovation in the public sector. Sir Humphrey is right in the sense that British Leyland can (or – rather – could) measure their success through the profit they generate. For a public institution investments in innovation are not counted as such: they are catalogued as “expenses”, and given the strong pressure towards increased efficiency and cost cutting, it is very hard to defend additional costs, even if they are to lead to cost reductions in the long run.

Furthermore, innovation in the public sector does not necessarily lead to cost reduction. The public institutions are serving other objectives that cost efficiency, objectives like the welfare of its citizens, democracy, law and order etc. Modern medical technology, medicines and treatments are very expensive. An expensive treatment that will raise the life quality of a patient may at the first glance look as a waste of money to the nearest accountant, the responsible civil servant or politician. For a company on the other hand, these expenses would be considered investments for future profit, and if there were enough paying customers, they would, indeed be profitable.

It should also be noted that the innovative public institution have no way of documenting the effects seemingly costly innovations have on the society as a whole. If expensive, but efficient, health treatments lead more people to rejoin the workforce as productive citizens, their additional contribution to society may prove to be well worth the investments. And at this point we haven't even started to talk about values beyond the sphere of plain economics: the quality of life of the individual, the fact that friends and family may enjoy the presence of a loved one etc. To sum up: we lack the capability to document and prove the positive effects of some types of innovation. This is why Publin proposed, and we support, the idea of a thorough debate on the production of innovation statistics for the public sector.¹⁶

¹⁶ For a discussion of productivity measurement in education, social services and public management, see Johan Hauknes appendix' to Publin report No. D24 *Summary and policy recommendations* www.step.no/publin.

More recommendations

We will also like to draw attention to some of the recommendations made by the Publin project, and which are supported by our research (see the Publin summary report at www.step.no/publin):

Develop learning strategies

Public managers and frontline employees interviewed by Publin as well as Interact report a lack of dialogue between different parts of the public system, horizontally and vertically, while at the same time underlining the importance of knowledge diffusion.

Public institutions ought to develop in-house learning strategies needed to find, understand and make use of competences developed elsewhere. Public institutions will normally benefit from developing inter- and intra-organisational networking, coordination and cooperation at all levels.

Possible mechanisms for improving learning include:

- Systematic in house teaching by senior staff.
- The recruitment of relevant expertise.
- Staff suggestion boxes.
- The exchange between institutions of “guest workers”.
- Sabbaticals and measures for life long learning.
- Involving employees in the commissioning of new technology, services and research, thus making them part of relevant networks of expertise.
- Establishing formal networks and working groups with companies and organisations delivering competences and technologies, as well as with stakeholders, NGOs and relevant policy institutions.
- Participation in national and international forums for innovation and policy learning.
- Improved access to periodicals, databases and other sources of information and media surveillance (including mapping of relevant research from the Framework Programmes).
- The establishment of informal social arenas where people involved in innovation processes may meet and brainstorm. This includes workshops, conferences and the establishment of venues (in house cafés, regular dinners etc.) where people can meet.

One important reason for encouraging networking and inter-organisational forums is the need to combat “silo-mentalities” resulting from the existence of different belief systems. As we have seen in Interact, this also applies to professional conflicts or lack

of a common understanding of reality shared by management and professionals. If the parties do not share a common language, and have misleading pre-conceptions of the motives of the new partners (which are immediately understood to be rivals or opponents), communication will ultimately break down.

By meeting employees from other organisations, managers and front-end employees are exposed to different world views. Even if the parties do not agree on a common ground, the realisation that employees from other institutions, units or professional groups think in a different way may help communication.

Meetings are not a waste of time if they can be used to develop common ground. Moreover, one should also value other, less target-oriented, arenas that can be used to build trust: sharing some coffee and joining colleagues at a conference dinner. Much can be said about the effect partying can have on innovation. In short: to avoid mental and institutional lock-in public institutions must develop quality leadership and a social environment that create the right climate for change.

It is important to encourage pluralism as regards different approaches to improving service provision to client groups in terms of allowing many different service providing organisations (NGOs, stakeholder associations, private companies etc.) as they may generate different models and different types of innovation.

Public institutions, including ministries and agencies for policy development, have a tendency to neglect their own learning and innovation activities. Although they do actively learn through their day-to-day activities, there is often a lack of strategies for learning and innovation in directorates, councils and ministries. Publin pointed out that policy institutions should make active use of workshops, sabbaticals, courses and other forms of training. There could be exchanges of employees for limited periods of time, so that policy makers (including both civil servants and politicians) may learn to know other institutions and their cultures more intimately.

Furthermore, there may be implemented more radical recruitment policies, in order to avoid the clone problem (leaders employing people sharing their same belief system or educational background only) and in order to get a more even distribution as regards age, gender and educational background.

Recruitment can also be used to fill gaps in the institutional competence base, for instance as regards the capability of interacting with private suppliers or knowledge institutions. Even if the institutions is not going to do its own research (and most public institutions will not), it can often make sense to hire people with a basic science and technology background, as these may more easily communicate with innovation partners within or outside the public institutions. It is important, though, to avoid people that has their mind set on a scientific career, or that have a too narrow focus on a particular technology. Such experts might find hard to learn from the rest of the organisation.

Institutions should make active use of international organisations like the Nordic Council, the EU and its ERA-Nets, the OECD and the UN as learning arenas. International experience gives civil servants insight into alternative models for organising public sector instruments and strategies. Such activities also tend to

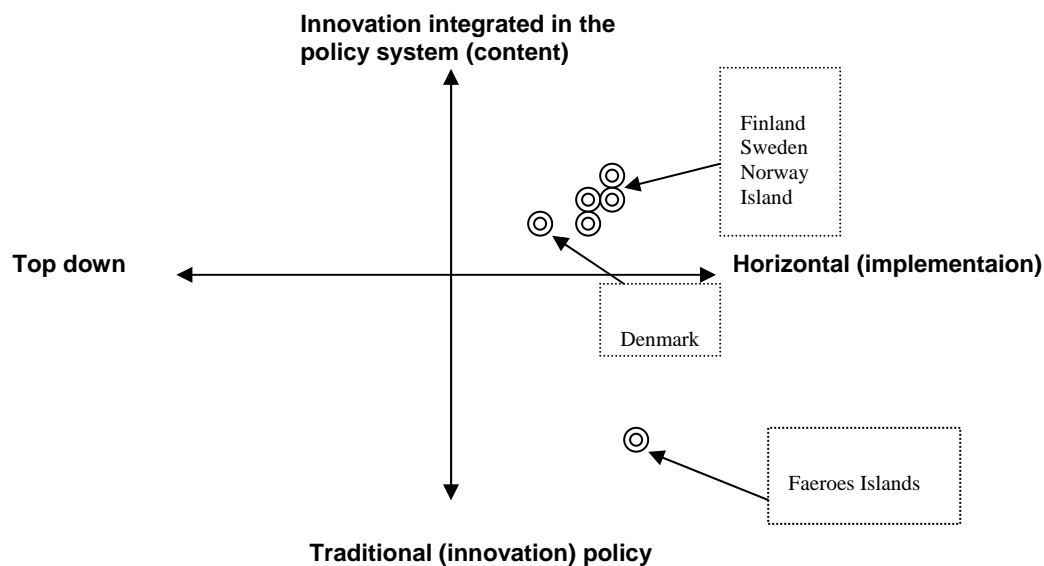
undermine at least some negative prejudices. Moreover, senior managers should invite junior civil servants along on some meetings and conferences, giving them access to the same networks.

Do the Nordic countries have a holistic innovation policy for the public sector?

In Interact report No. 3 we ask the question: How is innovation implemented in the public sector of the different countries? Having these two notions – policy and implementation – we have constructed a matrix that may help us to relate the Nordic countries to each other. This matrix is based on the different types of innovation policy measures and strategies identified through a mapping study made by the Interact team. (See report No. 3 for a review of relevant policy measures).

This type of comparative of comparative approach can tell us something about the relations between the political level and the daily operations and activities in the public sector. From matrix 2 we can see that all the Nordic countries have measures aimed at enhancing innovation in the public sector that are cross-sectional in the sense that both financing and performers comes from different parts of the public sector and also often from the private sector.

Matrix 2, Public sector innovation policy and measures in the Nordic countries.



From matrix 2 one conclusion is that at least on the performance level, parts of the public sector in the Nordic countries work in a non-traditional way to enhance innovation. In four of the six countries we have found horizontal innovation policy measures in this more restricted interpretation of the term.

Only in Denmark and in the Faeroe Islands could we not find explicit third generation innovation policies where the public sector is included as one of the factors to that will help the countries become more innovative.

In Denmark public innovation is dealt with within in a larger perspective that goes beyond a broad-based innovation policy. This larger perspective – covered by terms like globalisation, the knowledge society etc. – is also reflected in forums like the Globalisation Forum. In these larger fields innovation is an issue and an important one.

There are several problems with the conclusion from matrix 2, however. Firstly, we like point to the fact that we have not compared the volume (how many) and the intensity (to what extent) the measures are representative for the whole public of the public sector. Though there are some hints of this in the measures described in the appendix to report No. 3. Knowing that the public sector has a high proportion of GDP in the Nordic countries, the funding in millions of the measures for public sector innovation tells us that the funding is not substantial.

Secondly, we like to point to the inconsistencies at the policy level in all the Nordic countries. In Matrix 2 we show how and to what extent innovation policy deals with the public sector. However, when we change the perspective and ask how policies for a traditional and important part of the public sector (health care) deal with innovation, we get a different picture. From our narrative in report No. 3 we cannot conclude that innovation – understood as part of a broad based third generation innovation policy – is a major issue in health policies, even if we find a few cases where agencies responsible for the health sector finance or participated in programs etc that enhance innovation in the health sector.

It should be noted that we have not investigated the regional or local levels of the different countries, where we might find another picture. It should also be noted that the lack of an innovation policy in this meaning of the term, does not mean that we claim that there is no innovation taking place in this sector. As Publin and our own case studies have amply demonstrated there is a lot of innovation (in the meaning of a change of behaviour with a specific objective in mind) taking place in these institutions.

However, our hypothesis is that the latter is mainly based on (1) ad hoc, local initiatives or (2) signified by attempts to save costs and increase the efficiency and output of the institutions (cf. the introduction of New Public Management practices), not to improve learning and increase the innovative capabilities of the institutions per se. Our point here is that both health policies and the governmental agencies responsible for implementing health policies do not to a great extent deal with innovation in the public sector as part of overall policy strategies.

For instance: In Denmark we may find policy measures based on a systemic approach to innovation, also where there is collaboration across institutional and sectoral borders. What we cannot see clearly is a top-level broad-based approach to a holistic innovation policy in Denmark where (1) research and technological development is seen as but one of many types of learning for innovation, (2) where the effect of different sectors and general framework conditions – including the public sector – is taken into consideration and (3) where innovation in and for the public sector is included.

Danish innovation policies continue to be mainly based on a technology push perspective, where science and high tech development is considered more important than the absorptive capacity of firms and public organisations.

One explanation for the inconsistency between the existence of “holistic” innovation policy measures and the lack of an overall holistic innovation policy including the public sector might be found in the innovation policy systems in the Nordic countries. We have identified the major actors at different levels, and in none of the countries and at none of the levels could we identify the public health sector a major actor in the innovation policy system. That is: Ministries of health and social affairs do not consider innovation policy (in the political meaning of the term) an important part of their responsibility.

Instead we found that innovation policy in general is limited to ministries dealing with research and economic development, agencies like research councils and facilitators like Vinnova, Innovation Norway, Rannis and TEKES. At the performance level we found the public sector represented by universities and research institutes. It might be so that the limited expansion of the innovation policy system to include the public sector can explain the lack of concrete innovation policy measures in health policy. The field of innovation policy has (yet) not expanded to include public sector policy development. The public health sector is not incorporated in the system and because of this the relevant institutions seem to consider innovation “something that others do”.

There are a few notable exceptions to this general rule, like the Vios programme of the Research Council of Norway, and some more traditional technology and discipline oriented research programmes targeting the public sector, but these exceptions do not seem to represent a trend shift.

This interpretation is rather tentative and is more of an idea for further research. However, based on our and previous research, we will suggest some possible explanations for why this is so:

1. There is a general impression in the public that public institutions are conservative and bureaucratic, and therefore not able to innovate. This may lead some policy makers and politicians to conclude that change can only be implemented from the outside, through organisational reforms that is to lead to more efficiency or by the adaptation of technology and knowledge developed outside the public sphere.
2. The main exception from this rule is that most seem to accept that publicly owned universities, research institutes and laboratories do contribute to innovation in the public sector. This indicates that the old linear model of innovation, where innovation is seen as the end result of ideas born in research institutions only, is very much alive. This view may make people blind to the fact that the public sector is full of highly educated people and entrepreneurs that actively seek new solutions to the problems they are facing and that develop new and improved services and products in cooperation with research institutions and technology providers.

3. Due to a strong high tech focus in some quarters – in the meaning of R&D driven innovation being considered the “best” or “proper” form of innovation – the more incremental, service oriented and “market near” types of innovation found in public institutions may fall of the radar. This is also seen in industrial innovation policies, where it is often hard to find policy makers focusing on innovation in the service sector, even though public and private services totally dominate the Nordic economies.

Again we sense the linear model, whereby research is considered the birth place of all types of innovation. Publin, Interact and other studies have shown that this is a misleading model. High tech, research based, innovation is important – also in the public sector. But to say that this is the only proper form of innovation or even the leading form of innovation is wrong. Firstly high tech innovation is often the result of demands given by customers and users. Secondly, there is a lot of incremental, “market near” and organisational innovation taking place that may have just as important economic and social effects as new science or technology based inventions.

Thus, the lack of coherent and strategic broad based innovation policies for the public sector may be caused by cultural differences. These sectors have not been through the same “paradigm shift” as the move towards systemic innovation policies found in the industry policy arena.

Still, we have found examples of measures and policies that indicate that in some parts of the Nordic public sector, people do base new measures on such perspectives – if not on the ministerial level, so at least on the agency or front office level.



The Nordic countries seem to be more similar than different as regards the existence of a broad based, holistic, third generation innovation policy. Most of them have policy measures in place that at least partly reflect such a perspective. The only real outlier is the Faeroe Islands, which – mainly due to the small size of the country – show few signs of a third generation innovation policy.

Still, this holistic perspective is normally restricted to policies targeting private sector innovation, and to the extent the public sector is included, it is as a servant for industrial innovation. As an example we have presented the health sector, where all the Nordic countries have traditional health policies where innovation is – at best – considered only as a small part. We cannot find that the innovation perspective is integrated in these policies. Norway might be a possible exception in this regard.

With a few exceptions, public sector innovation is rarely integrated into broad-based innovation policies, and to the extent that they are, they are considered tools for industrial development (cf. buzzwords like public private partnerships, the use of public procurement etc.)

Innovation policy challenges and recommendations

Firstly we like to point to the problem of coordination at the policy system level. We have found that traditional ministries (e.g. health, social services) are not at present thought of as important actors in the innovation policy system. The challenge is to bring in the other ministries and agencies into the development of national innovation strategies.

Bringing in the ministries and agencies of the traditional public sectors means that the dialog at the governmental level should to a greater extent be horizontal. The funding institutions should to a greater extent co-ordinate their effort by enhancing programs and other measures in order to bring in the public sector into the innovation policy system. In one sentence: Expand the innovation policy system!

It should be noted, though, that this is in no way an easy task. Given the diverse cultures and the varied belief systems found in the different ministries and ministry departments, it will take time to develop a common understanding that makes such coordination possible. Developing learning arenas of this kind is time consuming given the best of circumstances. Furthermore, inter-ministerial policy development is also influenced by political struggles (anchored in the political level) and the usual struggle for power and money. This means that political processes leading towards a new holistic innovation policy including the public sector may soon get bogged down in political and social conflicts and lead to policies signified by unclear compromises.

An interesting test case is the previous Norwegian governments attempt to develop a holistic innovation policy (*en helhetlig innovasjonspolitik*).¹⁷ Interact has discussed this case with several people involved in this process, including the political level. Originally the politicians in the Ministry of Education and Research had planned to

¹⁷ See *Fra idé til Verdi; Regjeringens plan for en helhetlig innovasjonspolitik*.
<http://www.odin.dep.no/archive/nhdvedlegg/01/09/fraid001.pdf>

include public sector innovation in the development of the new strategy, but soon found that that would take too much time. That part of the exercise was therefore postponed. The influence of public innovation on private sector innovation was included, however.

The Ministry of Education and Research and the Ministry of Trade and Industry coordinated the exercise and established a large number of ministerial working groups that were to discuss everything from traditional innovation policy measures to the role of kindergartens in company recruitment. Our respondents report that the project was a success to the extent that one managed to develop a useful learning arena and advance a common understanding of what innovation is about. In other words: The ministries managed (mostly) to agree on a common “story” of the role of innovation in society. It was, however, much harder to develop new political strategies or find funding for new policy measures. The announced “action plan” eventually became “a plan” for innovation.

This project was of course an innovation in its own right, and if we are to pass judgment on its success we have to take several factors into consideration. The final document did present a clear vision of the role of innovation in the public sector, which was useful. However, it did not present any radical proposals as regards policy shifts or a new instrument, which has made many consider it a failure. Still, the people involved in this learning process are still around, in the same departments or in related organisations, and their ideas and understanding continue to influence innovation policy development.

It took more than 10 years for the systemic approach to innovation (level 2 in our figure on page 6) was commonly accepted in most policy circles (it still isn't in some quarters). There is reason to believe that the common understanding of the broad-based approach will take a little longer (level 3a) and that the inclusion of public sector innovation in regular innovation policies (level 3b) will take years. That should not stop policy makers from trying.

Still, some may argue that idea of unifying policies targeting innovation in the public sector with policies for the renewal and modernization of the public sector is to go too far – that it is unpractical or that the innovation processes taking place in the two sectors are too different. One may argue that policy makers responsible for the public sector already have policies for learning and innovation in place, even if they are not labelled as such.

Against this, we argue that even if Nordic ministries responsible for the public sector are aware of the need for change, they are (1) too hung up in a linear technology-push way of thinking or (2) too narrow in their approach, particularly as they have a tendency of focusing on cost cutting and productivity only, rather than the more creative sides of organisational development and in-house learning. Because of this they may benefit from cooperating with the ministries responsible for industrial innovation, as many of them have already developed a more nuanced systemic approach to learning and innovation.

Furthermore, the fact that both public and private learning and innovation take place in the same innovation system and the same learning arena and that innovation in one

part of society has clear consequences for the other, is for us an argument for uniting the two policy spheres into one innovation policy field. This does not mean that everybody will have to work together with everyone on all topics and areas of responsibility. That is not possible. However, it is possible for these various ministries and agencies to interact and learn from each other and develop a common understanding – a story – of what innovation is about.

Funding of public sector innovation

In order to enhance public sector innovation, we believe that innovation policies should also target measures for all types of innovation. This means concretely that main focus on research driven innovation should be complemented with for instance user driven service innovation in order to create new opportunities for public sector innovation.

Another challenge is the funding of public sector innovation. We are well aware that there is a difficult trade off between daily operations and innovative activities. The challenge is to handle innovation costs/benefits with operations costs/benefits. From our studies we have concluded that funding for public sector innovation is scarce, it is not focused and it suffers, not in every – but in many cases – from short-term planning.

This is a huge problem and affects all the levels in the innovation policy system. One way of trying to solve this problem is to consider long term, horizontal, programs that target public sector innovation and takes different types of innovation into consideration. This may not necessary mean that new or additional resources have to be allotted public sector innovation. It means however, that the recourses now available needs to be better coordinated.

There is also a need for clear strategies for research for innovation in the public sector. In some research-driven areas this is already the case in most countries, especially within medical research and defence. In other areas, where the technology-push perspective is less apparent, the research is more ad hoc, and based on the more immediate needs of ministries and policy agencies. This is exactly the kind of area where the authorities can make a difference, funding research programs for the future development of public services. A good example of how his can be done is found in the Swedish E-tjänster i offentlig verksamhet (E-services in public services), run by Vinnova.¹⁸ The program couples research institutions, public institutions and companies working in the area of e-governance. This program may also serve as a good example of international competence building, as some of the policy makers involved are also part of the new European eGovernment network, which is to coordinate the creation and integration of national e-government research and development programs.¹⁹

When designing research programs for innovation in the public sector it is important to keep the market pull perspective in mind. They should not be reduced to purely

¹⁸ http://www.vinnova.se/vinnova_templates/Page_____9962.aspx

¹⁹ <http://www.egovernet.org>

academic or technology driven exercises with little or no interaction between the users in the public sector and the researchers and engineers. Instead such programmes should be considered common learning arenas where the researchers learn from the civil servants and service providers in the same way the public employees learn from them.

There is also the role of the public sector entrepreneur to be considered. Both Publin and Interact have demonstrated that there are a large numbers of entrepreneurs in public institutions, i.e. knowledgeable and innovative people that would like to experiment and find new ways of doing things that might improve the quality of the services provided. The Nordic countries should increase the support for research programmes like the Norwegian Vios that support research on public innovation, but also develop “seed capital” schemes, whereby entrepreneurs may apply for modest sums of money for experiments and pilots.

Conclusion

The main message from this report is that innovation in the public sector must not be reduced to a matter of delivering new technologies to a passive recipient, a non-innovative public sector. There is a lot of innovation taking place in the public sector, within or outside the scope of policy planning. What is needed now are policies with a more comprehensive and broad based approach to innovation in the public sector, and which takes all relevant forms for learning, interaction and innovation practices into consideration. The use of knowledge is as important as the production of knowledge, and the social aspects of learning is as important as the technical ones.

The Nordic countries are lucky in having some of the most advanced and knowledge intensive public sectors in the world. No doubt this is a contributing factor to some of the wealth creation taking place in these countries. However, we still have not fully grasped the effects the public institutions have on innovation in the private sector, nor do we fully understand the interaction between the two sectors. What Publin and Interact have demonstrated is that it is probably more fruitful to understand productivity growth and wealth creation as the effect of innovation taking place in one large innovation system consisting of innovative people and institutions within all three sectors: private, public and civil. We need innovation policies with the same approach, which necessitates closer cooperation between various ministries and agencies on the innovation policy side.

Appendix: On innovation, knowledge and learning, a reflection on future research

Publin and Interact have documented the complexity of innovation processes in the public sector. The following text summarizes some of the academic findings underpinning this research and reflects on the needs for future research in this area. We would like to thank Publin researchers Seamus O'Tuama (University College Cork) and Ian Miles (University of Manchester/PREST) for important contributions to this text.

Knowledge for growth and welfare, background perspectives

As noted in this report, there continues to be a tendency to consider innovation as a result of research only, even in the private sector. As regards public sector innovation, there is a tendency to consider change as the end result of processes aimed at importing knowledge and technologies from the private sector.

However, both Publin and Interact has shown that innovation in the public sector is not the end result of such linear or quasi-linear processes. Innovation in the public sector is the result of interactive learning processes taking place within the public sector and between the public and private sectors. Moreover, it has been shown that innovation is based on knowledge and the development of competences in the widest sense. Research and development is only one of several forms of learning in this respect – albeit a very important one.

There is clearly a need for more research in this area, especially on the knowledge process in clusters — not just *within* institutions, but *between* institutions and in the wider public milieu (triple contingency) in which knowledge is generated, shaped and applied. This will give a more rounded and practical understanding of the knowledge processes in the public, private and third sectors.

The art of choosing among different actions is knowledge-intensive. There is a need for research that focus on knowledge that empowers innovation, i.e. changes intended to improve the expected performance of the organisation. This includes the adaptation of existing technologies, practices and/or formulae to new contexts; thus requiring local competence development. It follows that a major part of this base of practical or instrumental knowledge is intimately linked to the characteristics of the specific context (or institution); its functional purpose; the social, economic and cultural environment; and the wider institutional and political landscape.

In terms of understanding the knowledge process one may deploy what may be termed both a double contingency model (Mead, Schutz, Parsons, Habermas) and a triple contingency model (Eder, Strydom, Kilgore, Ó Tuama).

Double contingency is particularly useful in understanding the knowledge process at an institutional level. Here the knowledge base is necessarily subjective and contingent upon mental models or local theories about the organisation's activities. The subjective dimensions of the knowledge base imply that knowledge relevance – i.e. to what extent it is relevant for deliberate choices of behaviours and actions – is

always assessed on a subjective basis. This does not imply that the local theories are 'private' in the sense of having only individual validity. Quite the contrary, many of these theories will be shared within a community – hence they have an inter-subjective validity. In fact what constitute a social community are processes that involve information sharing, culture building etc. amounting to the development of 'commonly held beliefs and perceptions' or shared belief systems.

One must also place a wider context on the knowledge process and thus it will also adopt a triple contingency approach, which includes the idea of a third party or a public. Here public can mean wider civil society (macro-level) discourse around in this case health policy and stakeholder (micro-level) inputs into shaping knowledge (e.g. workers, patients, professionals). Triple contingency is an integral dimension of the process of collective learning, as it takes on board how knowledge is shaped through debate and discussion. It also helps locate the learning process in the light of changes in civil society (Offe) and the transformation of institutions (Burns).

Choices of action and behaviour, including modes of learning and innovation, can be more fully appreciated together with their institutional and extra-institutional contexts through this dual approach. An understanding of the characteristics and development of the purpose-oriented knowledge requires integration with and understanding of socioeconomic and socio-cultural contexts of the activities to be analysed. Caution is required before drawing generalised or context-free implications for the role of knowledge and the organisation and benefits from knowledge generation to a wider policy/practical context.

On the knowledge concept

We see knowledge as a key resource for enabling transformation of what an organisation does and how it does it. In short: knowledge is studied as a vehicle for change. Furthermore, it is similarly seen as a resource for improvements in decision-making processes including understanding the objectives, intentions and purposes underpinning the organisation.



Instrumental knowledge in the context of this study is about the transformation of informational resources into practical knowledge such as competences, capabilities and practices underpinning strategic activities of institutions. It is the knowledge capital that has been learnt, absorbed, understood or integrated into individual and collective lifeworlds that enable informed and reflexive decisions.²⁰ To understand the effects of knowledge on the economic and social development of society, one has to go beyond simplified and reified concepts about knowledge as a codified 'thing' that is produced in one environment and costlessly applied in another. The absorption of knowledge – and hence learning and the building of competences – is never free, and must be based on existing competences.

Information can be understood as a message containing structured data (Cowan, David, Foray), while knowledge is information giving meaning by knowledgeable agents (Fleck). We should look at knowledge understood as competences, i.e. information that has been found, understood and made use of by individuals and institutions. In this case knowledge communities consisting of private, public and third sector institutions involved in a particular.

²⁰ Following Gibbons, we will focus on mode 2 knowledge production, i.e. knowledge production carried out of a context of application. Mode 1 knowledge, i.e. knowledge produced in a context governed by a specific academic community, will be included to the extent it provides input to the relevant learning and innovation process. Mode 2 is transdisciplinary as opposed to disciplinary, heterogeneous as opposed to homogenous, hierarchical and transient as opposed to hierarchical and stable.

Typologies of knowledge

A typology is needed that can be used to discuss different types of knowledge. Many researchers have a tendency to develop typologies based on a *static* view of knowledge, where one discriminates between different *kinds* of knowledge. Hence Johnson and Lundvall (2001) distinguish between

- Know *how*: the ability to do something
- Know *what*: knowledge about facts
- Know *why*: knowledge about principle and laws
- Know *who*: knowledge about who knows what

Other distinctions are between *codified* and *tacit* knowledge (Cowan, David, Foray, 2000 and Johnson and Lundvall, 2001), *generic* and *specific* knowledge (Nelson), *individual* knowledge and *collective* knowledge (Johnson and Lundvall, 2001). Codified knowledge is understood as explicit and can be stored and transferred as information (Johnson and Lundvall, 2001). Formal knowledge is always codified. Tacit knowledge is knowledge rooted in practice and experience that is hard to articulate or communicate in codified form; it is implicit and wholly embodied in human individuals transmitted by apprenticeship and training (cf. Fleck, 1997; Lam 1998: 4).²¹ Generic knowledge is knowledge that can be widely applied, in contrast to specific knowledge.

One way of labelling combinations of different types of knowledge is found in Lam (2000), based on Collins (1993):

Cognitive Level: Knowledge Types

Ontological Dimension			
Epistemological Dimension		<i>Individual</i>	<i>Collective</i>
<i>Explicit</i>		Embrained Knowledge	Encoded Knowledge
<i>Tacit</i>		Embodied Knowledge	Embedded Knowledge

Source: Lam (1998)

- 1) *Embrained knowledge* is dependent on the conceptual skills and cognitive abilities of the individual. It is formal, abstract or theoretical knowledge, that is primarily obtained through formal education and training – ‘learning-by studying’.

²¹ According to Cowan, David, Foray (2000) codification is a matter of effort; most knowledge (for example how to ride a bike) can in principle be codified.

- 2) *Embodied knowledge* is tacit-individual knowledge, coming from experience. It is context specific, based on hands-on-experience – ‘learning-by-doing’.
- 3) *Encoded knowledge* is codified and stored in blueprints, recipes, written rules and procedures. It is collective-explicit.
- 4) *Embedded knowledge* is the collective form of tacit knowledge residing in organisational routines, practices, values, norms and shared beliefs.²² It comprises the unwritten rules of the game (Scott-Morgan, 1994). This knowledge type plays a key co-ordinating role but it is often hard to point out. It is relation-specific and situated.

Lam (1998) uses these knowledge-combinations to typify organisations according to what knowledge type is dominating and to talk about organisational learning and innovation.²³ The typology is useful, but Lam pays little attention to the incentives for innovation, overall framework conditions (regulations, education and so on) and horizontal and vertical links of companies with suppliers, users and knowledge holders. We should understand knowledge as a phenomenon that requires ‘human absorption’, meaning that what Lam calls ‘encoded knowledge’ will be considered information or data before it has been read, understood and put into use.

One may also make use of philosophical approaches to the concept of knowledge. Especially Aristotle, but also Plato, the sophists, and the rhetorical tradition, are increasingly used in current discussions about knowledge. Aristotelian distinctions between tacit and articulated knowledge forms like *episteme*, *theôrêsis*, *pathos*, *poiêsis* (*tékhnê*), *khreîsis* (*tékhnê*), *praxis*, *phrônêsis*, *theôria* are important.

However, one should *not* aim at creating one ‘great unified theory’ of knowledge. That would be far too ambitious, and probably not very productive. One should rather use philosophical and scientific discussions as sources of learning and inspiration, and make use of concepts and theories to the extent they fit with a dynamic, systemic and broad based approach to knowledge, learning and innovation.

Learning

Sophisticated understandings of learning and learning processes are necessary to understand the dynamic concept of knowledge in use. There is an enormous literature on the topic of learning,²⁴ but there is no generally shared concept of learning (Easterby-Smith, 1997).

We will stress the aspect of learning as a vehicle for behavioural change given its focus on knowledge as a means for innovation. According to Huber (1991) an entity learns if, through the processing of information, the range of its potential behaviours

²² The descriptions are taken from Lam (1998), published in Lam (2000).

²³ The following descriptions are from Lam (1998), published in Lam (2000).

²⁴ See for instance specialist journals such as *Organizational Learning* and *Management Learning*

is changed. In the policy literature it is quite common²⁵ to define learning as a change in the habit of thought. These changes open up new possibilities for alteration in behaviour.

Individual learning and organisational learning cannot be separated: Organisations are the social groupings of individuals within which learning occurs, and the institutional forms that stabilize and transmit the resulting lessons (Clark). When collective learning extends individual companies we may talk about *social* learning.

Learning theory, which emphasizes how individuals in institutions organize information in social categories (Rosch; Fiske; Kulik), has a distinct role in new institutional theory. Institutions learn from their experiences through accumulating historical experiences.²⁶ Results and inferences of past experiences are stored in standard operating procedures, professional rules and rules of thumb. Institutions learn along several dimensions, for instance related to modification of strategy, competence and aspiration, and in the interaction of these dimensions.

Learning processes are the foundation for an institution's ability to find, understand and make use of existing knowledge. We need to study such processes carefully, in order to find examples of successful learning environments that encourage innovation.

Belief systems and learning

Hermeneutical philosophy operates with the idea of 'life worlds'. A life world is the sum of the individual's personal experiences, his or her educational background and cultural environment. The life world changes in meetings with other persons and new experiences, which again alters the person's perception of reality (the hermeneutical circle, cf. Ricour, Heidegger, Gadamer).

Learning is not about adding 'facts' to some kind of internal 'knowledge bank'. It is a complex process where learning both expands a person's internal repository of information and changes his or her understanding of nature. Radical life world changes may allow an individual absorb knowledge that was previously out of reach, as she didn't have the life experience and concepts needed to absorb this knowledge.

This has serious impacts for knowledge policies. Education is not only about the facts you learn. It is about learning to learn, about learning to think differently and outside the box. Given that we live in a society with rapid technological and cultural change, people and institutions must be prepared for unpredictable, to adapt to new and unforeseen challenges. Any knowledge policy must take into consideration the need to change or expand existing belief system, or at least encourage communication and learning between different organisations and social groups.

²⁵ It is common for the tradition pioneered by Hecló (1974) and Sabatier (1993; 1987).

²⁶ March and Olsen; Levinthal and March; Olsen; Brunsson and Olsen; Olsen; March

Publin studied role of belief systems ('rationalities') on learning and innovation. By belief systems are meant relatively long lasting understandings of reality shared by members of a culturally and socially defined group. This squares with Sabatier (1993) who talks about *policy core beliefs* and *secondary policy belief* aspects, saying that policy core beliefs (of advocacy coalitions) are very stable.

A related term is 'mental models', i.e. individual belief systems, which are more or less shared with others (North). At the organizational level, shared mental models are labelled as organizational norms and routines (corporate culture). At the level of large groups they are labelled as idea-systems, norms, ideologies, attitudes. Shared mental models imply common language and facilitate communication. Earlier patterns of decisions affect later patterns; learning is path-dependent (Sinclair-Desgagne and Soubeyran).

Within both economics and organization science there is a tendency to incorporate a cognitive approach to the subject of organizational learning. Examples are Nooteboom's 'logic of abduction' model, Wood and Bandura's social cognitive theory of organizational management; Walsh's studies of managerial and organizational cognition, Harris's schema-based perspective on organizational culture, Neck and Manz's work on the impact of mental strategies on employees and Denzau and North's research on mental models, institutions and ideologies.²⁷

In the cognitive approach, learning is reformulated as incentive systems, preferences, risk aversion, preference for order, and the need to reduce cognitive dissonance. These are crucial elements in policy-learning processes, and can be used in studies of knowledge development and innovation in general. This psychological approach also makes use of concepts that are related to, or can even be considered the foundation of, rationalities and belief systems. Schemas are expectations, assumptions, and generic prior knowledge that allow us some sense of prediction and control (Fiske and Taylor).²⁸

Policy learning

Any study of policy development must be based on a clear understanding of policy learning is essential, i.e. the learning processes underlying policy development. One important goal is to discover possible policy failures in the field of knowledge

²⁷ Within the organisational literature growing attention is given to tacit knowledge, a very important but hard to control form of knowledge; examples are the publications on organizational routines as a form of procedural memory by Cohen and Bacdayan (1994) and organizational routines as grammars of action by Pentland and Rueter (1994). Related to this is the literature on motivation, incentive systems and the psychology of change, for example Hirshleifer and Welch on 'inertia' (2001), Thomas and Velthouse on 'cognitive elements of empowerment' and its effect on intrinsic motivation (1990), Bowles, Gintis and Osborne on 'Incentive enhancing preferences' (2001).

²⁸ Cognitive psychology was partly introduced in organizational theory with the Carnegie school and Weber's theory of bureaucracy. However, it was first with Herbert Simon, James March and Richard Cyert (Simon 1945; March and Simon 1958; Cyert and March 1963) that cognitive science per se was introduced to organizational theory. See also March's garbage can model (Cohen and March 1974; March and Weissinger-Baylon 1986; March and Olsen 1976, 1989, 1995).

policies, both at local level and in the policy-making apparatus. Sabatier defines policy learning as ‘a relatively enduring alteration of thought or behavioural intentions that are concerned with the attainment (or revision) of the precepts of a policy belief system’.

New institutionalism holds that organizations lose their ambiguity through organizational norms and routines for appropriateness that evolve gradually (Powell and DiMaggio; Zucker). However, the routines do not necessarily result in effectiveness. Political choices are decision-making processes made by ambiguous organizations and actors with inconsistent preferences. Often there are short time limits for each decision. It is essential to get the attention of decision-makers in order to make decisions. Whether attention is obtained depends on the character of the decision-making process and what is embedded as interesting in the organizations. This is of direct relevance to studies of innovation in the public sector. Not only must managers and policy-makers have the capability to develop relevant strategies for learning and networking, but they must also be able to follow up on a day to day basis.

Organisational ‘knowledge policies’, an organisation’s strategies and practices for knowledge development, is part of a larger cultural and social context. There are, for instance, struggles for influence and power (Bozeman et. al.). Organizational politics studies understand organizational politics as aggregated influence tactics used by employees (Kipnis et.al; Ferris, Russ and Fandt; Kacmar and Ferris; Folger et. al.). Given that we also have to look at policy processes within the knowledge area (research, innovation and education), this aspect must be taken into consideration. Policy makers may be considered rational actors, but they follow another set of rationalities to for instance researchers. This is why policy documents may mix arguments from different strands of policy thinking in order to argue for a political strategy or policy measure. These arguments are used in a struggle for power and funding (Koch and Oksanen).

The advocacy coalition framework (ACF) argues that technical information and formal policy analysis are generally used in an advocacy fashion (Sabatier and Jenkins-Smith). According to the ACF approach learning across coalitions is more likely when an intermediate level of conflict is involved, when issues are analytically tractable, and when a professional forum is utilized. This does not mean that technical information is unimportant. Even when the accumulation of technical information does not change the views of the opposing coalition, it can have important impacts on policy, at least in the short term, by altering views of policy brokers or other important governmental officials (cf. Gormly 1986). ACF researchers find that most changes in policy beliefs have to do with secondary aspects, not with core beliefs. For a change in policy *core* attributes a change exogenous to the policy subsystem is normally needed. But such changes alone are not sufficient for policy change; they must be interpreted by subsystem actors and skilfully exploited,

Sabatier and Jenkins-Smith say that the main influence of the public on policy acts is in limiting the range of feasible strategies, rather than positively determining the details. They claim that the public lacks the expertise, time, and inclination ‘to be active participants in a policy subsystem; that role is reserved for policy elites’. They see public opinion as a restraining force rather than a proposing one. This is a topic

that will have to be addressed especially in the light of triple contingency and new social movement theory.

Innovation

Given that both Publin and Interact look at knowledge as a tool for change, innovation has been an integrated part of these studies, and should be so in the future. Studies of innovation in the public sector must include innovation theory, an amalgam of various disciplines: economics, management, organisation psychology, cognitive theory and system theory. A consolidated finding from the literature on innovation (Lundvall, Edquist, Van de Ven and others) is that innovation involves learning, coordination and deployment of resources.

To this tradition also belongs the so-called triple helix perspective – studying the interaction between companies, research institutions and policy organisations – and network alignment theory.

Innovation requires an absorptive capacity, an ability to find, understand and make use of knowledge (Cohen and Levinthal) as well as a willingness to innovate. Innovation also requires the management of attention, whole-parts relationships, the riding of good ideas into currency and more (Van de Ven). Furthermore, innovation occurs within national systems of innovation (Freeman, Lundvall, Nelson, Edquist) and innovation networks or clusters that shape it. Systems theories highlight the external and internal environments in which innovation occurs and dynamic aspects of path dependence and trajectories.

The relevant environment or system can be conceptualised in different ways and on different levels. It may include technological actors and organisations, and consist of the interaction between these actors. Or it may be seen in terms of the framework within which institutions act: institutional structures, social values, political cultures, and so on. .

Like in Publin, future research may use organizational theory, new public management (and its critiques) and political science. As regards organizational theory one may look at research based on systemic approaches, especially the so-called open system perspective, as this allows study of the interaction between different subsystems interlinked in changing coalitions. Selected schools of the open system perspective are for example: organizations as loosely coupled systems (Cyert and March; March and Olsen; Pfeffer and Salancik), David Easton's political system, Jay Galbraith's contingency theory, Charles Lindblom's incremental budgeting-model and Karl Weick's cognitive model, and system design theory (Ashby; Burns and Stalker; Mintzberg; Perrow).

The actor network approach (Latour and Woolgar; Callon; Latour; Callon) argues that the connection between technology and society is a seamless web, where it is impossible to argue that some factors are essentially technological and others social. According to this approach society consists of various actor networks that are all trying to convince others that their scenario is the best one. A scenario is an image of the future, and the actor network participants share common views on how this scenario is to be made real. We may use these perspectives to enrich our

understanding of how belief systems influence knowledge development and innovation.

The economic character of knowledge

The rationale of public innovation and R&D policies is basically grounded in the economic character of technical knowledge. Scientific and technological knowledge of importance to industrial development and economic growth have aspects that it shares with a range of other economic good characterised in an economic sense as *public goods*, in contrast to those of *private goods*.²⁹

Perfect private goods are what are termed excludable and rival. Excludability refers to the opportunity to express property rights over the good, with a perfectly excludable good and owner can exclude other users costlessly from getting access to the good. Rivalry expresses broadly speaking that the good can only be used one at the time, when used or consumed it cannot be consumed by another.

Public goods are both non-excludable and non-rival. Knowledge in this context is seen as a non-rival good, as, the same piece of knowledge may be used simultaneously by several users. It is also partly non-excludable, for the cost of a photocopy or a PDF file, access to this 'piece of knowledge' may be accessed by others.

It is important to keep in mind, however, that this 'piece of knowledge' is not truly knowledge in the way the word is used by Publin and Interact. It is rather a piece of information, and is as such of no value unless the reader has the competences needed to find, understand and makes use of it. Moreover, some types of knowledge and information are not freely available (kept secret, protected by patents or just 'hard to find'), others are freely available through books, publications and web sites.

There are clearly degrees of accessibility that are relevant to the innovative capabilities of firms and institutions, meaning that it is of policy importance. When studying the knowledge building strategies of knowledge communities, one must therefore, look at the effects of publicly funded research, intellectual property rights, tax incentives and policy measures aimed at strengthening knowledge development in firms and institutions.

The health sector

Public sector innovation is a key contributor to national growth and to the welfare of individual citizens across the developed world. Yet, little research on public sector innovation exists. In part, this is a legacy of the old view that manufacturing is the sole source of productivity growth and economic wealth, while services are unproductive and technologically backward. In part it is the result of a lack of interest in public sector innovation among innovation researchers.

²⁹ For a discussion of public and private goods, see Michel Callon: "Is Science A Public Good?", *Science, technology and Human Values*, Volume 19, Issue 4 1994, 395-424.

To the extent there are studies of public innovation, they are often focused on internal learning and innovation processes, seen as something separate from the private and third sectors.

However, there are large grey areas of interaction between public, private and third sector organisations. Hospitals are the prime example, there are examples in all three sectors, they purchase and use of medicines, machinery and equipment developed in the private sector (often through public support); they often initiate and influence innovation processes. Through interaction with professional institutions and patient organisations they change organisational practices and types of health care.



Public sector innovation is often equated with effectiveness and downsizing, meaning that the overall goal is to reduce cost and increase productivity and not to develop new and better services that contribute to the improvement of people's quality of life. It is about defining the common good on exchequer criteria rather than public welfare.

Interact – and to a certain extent, Publin – have studied learning and innovation processes in the health sector, in order to understand:

1. how institutions develop internal competences needed to take part in relevant innovation processes, and
2. how these institutions interact with other institutions and in order to get access to relevant knowledge and technology

Publin and Interact have identified several types of innovation, including:

- product innovation taking the form of new/improved products/services.
- service delivery
- administrative and organisational innovation
- conceptual innovation

- policy innovation (including incremental innovation based on policy learning by the government, and radical innovation sparked by conceptual innovation)
- systemic innovation (including privatisation and the contracting-out of public services)

Interact has made a preliminary exploration of the role of innovation ‘champions’ and ‘policy entrepreneurs’ who fit Schumpeter’s definition of entrepreneurship: they are willing to experiment and take risks in applying, for the first time, radical new ideas. These are either ideas which they have developed themselves, or else are the first application of ideas developed elsewhere. Of course, the environment within which these innovation champions and policy entrepreneurs operate is very different to private sector markets. Social responsibility and accountability, plus the very different networks found in the public sector, give rise to a very different set of barriers and enablers for the diffusion of innovations. There is a need for more research that will investigate the range of social, technical, and political ‘management skills’ and ‘knowledges’ that are employed by public sector entrepreneurs on a daily basis.

Given such a wider understanding of public innovation, it should be possible to develop new policy recommendations that do not only encourage relevant learning and innovation processes within the public sector. Given the close interaction between public and private innovation, such studies should also have an effect on policy development in the field of industrial innovation policy and economics.

Literature

As part of our assignment the Interact team has done a survey of literature on innovation in the public sector. The following references should be of help to students, researchers and others interested in this topic. The starting point for this literature collection was made by the Publin team.

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Nordic Innovation Centre

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The Nordic Innovation Centre initiates and finances activities that enhance innovation collaboration and develop and maintain a smoothly functioning market in the Nordic region.

The Centre works primarily with small and medium-sized companies (SMEs) in the Nordic countries. Other important partners are those most closely involved with innovation and market surveillance, such as industrial organisations and interest groups, research institutions and public authorities.

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