

Measuring Public Innovation in the Nordic Countries

Final Report

February 2011

By Carter Bloch

Based on contributions from project participants

About the project

The paper is part of the output from the joint Nordic research project 'Measuring innovation in the public sector in the Nordic countries: Toward a common statistical approach' ("Copenhagen Manual"). The project was initiated by the Danish Agency for Science, Technology and Innovation and is supported by:

- The Danish Agency for Science, Technology and Innovation
- The Nordic Innovation Centre
- Innovation Norway
- The Research Council of Norway
- VINNOVA
- The Swedish Association of Local Authorities and Regions
- The Finnish Ministry of Employment and the Economy.

The project started in November, 2008 and is completed in February, 2011. Project work was organised in 7 work modules:

- Module 1 - Conceptual framework: Background research, design of overall conceptual framework, indicators, incorporate insights from user needs and feasibility study.
- Module 2 - Survey methodology: statistical unit, activity classifications, target populations, measurement of concepts.
- Module 3 - Mapping user needs: form expert/stakeholder group in each country (hold two national meetings with group; the first to discuss needs and uses for public sector innovation data and indicators; the second to gain feedback on proposed indicators and other project work).
- Module 4 - Feasibility study: Interviews, testing and study of potential respondents. The feasibility study will be undertaken in two stages: 1) interviews and cognitive testing of a group of potential respondents (public sector institutions); and 2) small scale testing of a pilot questionnaire (developed in module 5) with interviewees.
- Module 5 - Draft of Pilot Questionnaire: Developing one or more pilot questionnaires, including experimental modules.
- Module 6 - Pilot testing of questionnaire: Each country will conduct a large scale pilot survey of public sector institutions.
- Module 7 – Synthesis final report and recommendations: draft of guidelines for data collection, drawing on and incorporating work from all modules.

The first five work modules comprised the stage 1 of the project, in which a preliminary measurement framework was developed. A conference and technical workshop was held in

Copenhagen in February 2010 on the basis of this preliminary work. From May to October 2010, pilot studies were conducted in the five Nordic countries.

The project is coordinated and led by Carter Bloch on behalf of DAMVAD. The following institutions took part in the project:

- DAMVAD, Denmark (Michael Mark, Kristian Puggaard and Lydia Lassen Jørgensen)
- The Danish Centre for Studies in Research and Research Policy (CFA), Aarhus University, Denmark (Carter Bloch and Peter S. Mortensen)
- NIFU Nordic Institute for Studies in Innovation, Research and Education, Norway (Markus M. Bugge and Stig Slipersæter)
- RANNIS (Þorsteinn Gunnarsson)
- Statistics Finland (Mikael Åkerblom, Mervi Niemi and Ari Leppälähti)
- Statistics Norway (Frank Foyn and Lars Wilhelmsen)
- Statistics Denmark (Helle Månsson)
- Statistics Sweden (Roger Björkbacka and Per Annerstedt)
- Danish Agency for Science, Technology and Innovation, Denmark (Thomas Alslev Christensen, Jesper Rasch and Hanne Frosch)

For more information on the project and its deliverables, see www.mepin.eu.

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Executive summary

1.1 Objectives

In order to be able to improve our knowledge and understanding of the rate and degree of innovation in the public sector, as well as about its incentives, processes and impact, there is now an increasing awareness of the need for more systematic and comparable data on innovation in the public sector.

The objective of the Nordic research project “Measuring innovation in the public sector in the Nordic countries (MEPIN)” is to develop a measurement framework for collecting internationally comparable data on innovation in the public sector, which both will contribute to our understanding of what public sector innovation is and how public sector organisations innovate and will develop metrics for use in promoting public sector innovation.

1.2 Method and implementation

The first stage of the project involved the development of a preliminary conceptual and survey framework for measuring public sector innovation, drawing both on extensive reviews of earlier studies and related literature and also on empirical work conducted by the project in the five Nordic countries. This included meetings with key stakeholders from policymaking organizations and interest groups, and interviews with potential respondents from a variety of public sector organizations.

The conceptual framework includes measures of innovations, inputs to the innovation process, and a series of indicators that seek to measure how public sector organizations innovate. Impact measures are also examined, though these prove more difficult to measure.

Based on this work, a pilot study was conducted among public sector organisations in Denmark, Finland, Iceland, Norway and Sweden. A common Nordic questionnaire was developed and tested in the pilot study, covering the following topics dealing with innovation in public sector organizations:

- Innovations
- Innovation activities and expenditures
- The objectives of innovations
- Information channels for innovation activities
- Innovation cooperation
- External funding for innovation

- Innovative procurement practices
- Driving forces of innovation
- Innovation strategy, management and competences
- Barriers to innovation

1.3 Results and conclusions

Examples of innovations in the public sector

Examples from the Nordic pilot study span across all four types of innovations. Examples of product innovations are group therapy and training for depressed people at home using video, a new treatment for children, so called Multi-systemic Therapy (MST), and the use of PARO seal in residential homes (the PARO seal is a robot in the shape of a seal, able to move its eyes and make sounds). Examples of process innovations include new registration routines of crime reports received, new logistical routines for acute operations, and digitalization of work processes that allows electronic interaction across services. Organisational innovations include interdisciplinary cooperation between administration, nurseries and settling in schools, the combination of various services and function in one department that provides a single 'front office' for users, and the establishment of a 'Family House' to coordinate service provision to children and youth in the municipality. And, examples of communication innovations are international marketing of educations, campaign against false drugs, and automatic text message updates on incidents or municipal project work (eg. utilities).

Types of innovations

The concept of innovation is operationalised both through an overall definition of innovation and the distinction of four individual types of innovations: product, process, organisational and communication. The definitions seek to take account for the nature of public services, which are often people-oriented and less technical, and at the same time maintain comparability with definitions used for businesses in the Oslo Manual.

The pilot study found very high shares of organizations with innovations, both overall for all types and for individual types of innovations. For example, shares of respondents with a product or a process innovation ranged from 69 to 84 percent across the Nordic countries. There may be a number of possible explanations for this result, for example that these measures also include day-to-day incremental changes or upwards bias due to higher response rate among innovation active organisations. Given that diffusion is important, it is very relevant to include innovations that are only new to the organization (but exist elsewhere). On the other hand, in order for this measure to be useful, they must reflect substantial changes that matter for the organisation's operations.

The usefulness of these indicators would be enhanced both by making the definitions more restrictive and potentially also introducing measures that allow the classification of innovations (where novelty is an example).

Measuring inputs to the innovation process

The pilot study results for quantitative measures of innovation personnel and expenditures were not particularly encouraging. Results seem fairly plausible for the number of innovation personnel, though there may have been different interpretations of what to include (personnel that are directly involved in the development of innovations vs. those that are affected by the innovation). The question on innovation expenditures had both high item non-response and diverging results across countries. However, in both cases, we view it worthwhile to continue work with these indicators. Innovation personnel can be better clarified to ensure a common understanding of the concept. Concerning innovation expenditures, it would be helpful both to reconsider the definition of innovation activities, perform closer analysis of existing results, and act to ensure that the respondent is reporting innovation expenditures for the same unit for which the overall operating budget is reported (for example, asking for overall budget amounts at the same time). In addition, experience with business innovation surveys suggests that respondents' understanding of innovations and innovation expenditures increase over time as they become more familiar with the concepts.

The role of ICT in public sector innovation

There is a substantial amount of policy focus on E-government and other forms of ICT-based innovation for the public sector. Due to concerns regarding an excessive technological focus, we have not developed questions that seek to measure how advanced organisations' ICT-capabilities are. Instead, the pilot studies have sought to capture the role of ICT for innovation through a number of indirect questions, and also through the examples of innovations provided by respondents. An examination of the many examples provided found that the majority were ICT-related, and ranged across all four types of innovations. Results concerning process innovations also provide an indication of the prevalence of ICT-based innovations to improve supporting or back-office functions. In addition, between 40 and 50% cited the improvement of online services as a highly important objective for their innovation activities. Shares are typically higher for organisations in local and regional government, perhaps reflecting their closer contact to users.

Objectives, effects and outputs

Generally, the broad objectives of improved efficiency, quality and user satisfaction were the most common objectives for innovations. However, arguably, some of the more specific objectives (such as addressing social challenges, fulfilling new regulations, and improving

working conditions) are more informative and provide greater opportunity to distinguish different types of innovators.

Effects and impact measures are also very important. Some questions on these were tested in this project, but encountered difficulties and ultimately were not included in the final common questionnaire due to space considerations. However, Norway and Sweden both included a question that asked whether stated objectives had been achieved. However, given the high policy importance of these measures, it is important to revisit these topics in future work. This includes both expected effects and the scope of innovations (share of organisation affected by the innovations). Some examples can also be found in related studies (EU Innovation Barometer and NESTA Public Sector Innovation Index).

Measuring how public sector organisations innovate

Beyond inputs (innovation expenditures) and outputs (innovations and impacts) is the important question of *how* public sector organisations innovate. How do they access and use new knowledge? How do they structure, organise and promote innovation? The project has developed a series of indicators that seek to shed light on these questions, drawing both existing and own development work. This includes drivers of innovation, innovation cooperation, information channels used to access new knowledge, purchases of new knowledge and innovative services, innovation strategy and the organisation of innovation activities, and the role of barriers to innovation processes.

Target population and statistical units

The pilot studies demonstrate the challenges in defining an appropriate target population for public sector innovation surveys. Should surveys cover the whole public sector, public services (public or private providers) or a limited set of sectors/organisations?

The main focus of the pilot study was within general government. The basic approach followed by the Nordic countries was to use business registers and consider public sector units that are classified as enterprises, along with additional units within selected sectors, such as hospitals and schools. This approach functioned fairly well for the pilot study but at the same time revealed a number of issues that will need to be addressed in future work. Differences were found across Nordic countries in the types of organisations that are registered as enterprises (or legal units), and some of these units were not considered relevant for a survey of this type. These differences are likely to be even greater when considering a larger and more diverse group of countries. Additional work is needed to examine the quality of business registers and to compare across a wider set of countries.

Heterogeneity of public sector organisations

A much discussed issue concerning the measurement of public sector innovation is the heterogeneity of public sector organisations. Is it possible to conduct a harmonised survey across such a wide range of organisations? When examining results across subgroups for individual countries, the general picture given by the study is that shares for main indicators (eg. Innovations) are quite similar while there are more significant differences in measures of how organisations innovate. Though many respondents found the questionnaire difficult to answer, there is no firm indication that specific groups found the survey less relevant to them than others. This suggests that it is possible to use a 'generic' questionnaire across different types of organisations, and to capture eventual differences in innovation within this common framework. However, this does not mean that a differentiation of questionnaires may not be useful in some cases. In particular, for specific groups of institutions, such as hospitals or schools, it would be beneficial to supplement a core set of questions with modules of questions that target specific aspects relevant to the group in question.

An international agenda for further development

A central aim of this project is to contribute towards the development of international guidelines for the collection of data on public sector innovation. The development of guidelines would provide an opportunity to make a detailed assessment of this and other related initiatives, and how they can contribute to international guidelines. In addition, international guidelines are needed to help ensure a degree of comparability.

At the same time, future surveys, potentially taking many of this project's recommendations and lessons into account, can build on the work undertaken in this project. There is also a need for greater knowledge from a broader set of countries concerning many survey related issues. Among these are: the basic structure of the public sector across a wider range of countries (such as those of the OECD or EU); investigation of the quality and coverage of business registers; comparison of business registers and other registers; and examination of other classifications or the correspondence between NACE and COFOG classifications.

2 Introduction

The vast literature studying innovation in private, market-based companies have greatly improved our understanding of the processes underlying innovation and social and economic change in modern economies. However, the important role that the public sector plays in most developed economies has been largely excluded from this work. The lack of quantitative evidence limits the ability to understand and promote public sector innovation.

The public sector has traditionally been viewed as being radically different than the private sector in terms of innovation, with the public sector often seen as a regulatory framework for innovation in the private sector, and as a passive recipient of innovations from the private sector. However, in recent years, public sector innovation has been increasingly regarded as a central factor to sustain a high level of public services for citizens and businesses, as well as addressing social challenges and improving welfare. Public sector innovation may have considerable effect not only on the quality and efficiency of public services itself, but also may influence the private sector's ability to innovate.

The importance of public sector innovation

Innovation in the public sector may be motivated by a number of economic, industrial, political, relational and personal factors (Bugge et al., 2010). There are economic motivations for stimulating a cost-effective and productive administration and management of the civil service, such as financial management, health services, collection of taxes and educational offer.

An innovative public sector is also important to innovation in the private sector, due to the close interactions between the private and the public sector in many domains, and due to the role of the public sector as a facilitator of infrastructure for the private sector (e.g. knowledge development through education and research, communications such as roads, railways or ICT, and industrial policy instruments). Public procurement practices can also present important incentives that may have a major impact on innovation in private sector.

An innovative public sector that offers quality services (new service or new aspects, ease of use, access, timeliness) acts to strengthen relations between the public sector and citizens, for example through informing the public, through taxation, education or in health care. Public sector innovation thus may improve the understanding and legitimacy of how the public sector works (Vigoda-Gadot et al., 2008).

Innovation in the public sector may be motivated by political reasons. Political support and votes are gained through being seen to perform better than opposing political actors, and the provision, delivery, and cost of public services is an important domain for competition between claims of effective (potential) performance.

Innovation in the public sector may also be motivated by personal reasons. Public sector policy makers, managers and professional workers may gain personal satisfaction, motivation and status among their professional community and society at large from improving public services and the users experience with these.

In order to be able to improve our knowledge and understanding of the rate and degree of innovation in the public sector, as well as about its incentives, processes and impact, there is now an increasing awareness of the need for more systematic and comparable data on innovation in the public sector. This was one of the key recommendations of the Publin project on Innovation in the Public Sector (Koch et al. 2005). The need for measures of public sector innovation has been stressed in a number of countries and in international organisations such as the OECD and the EU¹.

Developing a measurement framework

The objective of the Nordic research project “Measuring innovation in the public sector in the Nordic countries (MEPIN)” is to develop a measurement framework for collecting internationally comparable data on innovation in the public sector, which both will contribute to our understanding of what public sector innovation is and how public sector organisations innovate and will develop metrics for use in promoting public sector innovation. The work of the first stage of this project is documented through, in all, six papers²:

- The public sector in innovation systems (Markus M. Bugge, Johan Hauknes, Stig Slipersæter and Carter Bloch)
- Towards a conceptual framework for measuring public sector innovation (Carter Bloch)
- Survey methodology for measuring public innovation (Peter S. Mortensen)
- Mapping user needs (Lydia L. Jørgensen)
- Feasibility study of public sector organizations (Per Annerstedt and Roger Björkbacka)
- Nordic survey on public sector innovation 2009 – draft pilot questionnaire

Based on this work, a pilot study was conducted among public sector organisations in Denmark, Finland, Iceland, Norway and Sweden. The results of the pilot studies and an assessment of the methodologies used are presented in Report on the Nordic Pilot Studies – Analyses of methodology and results (Bugge et al., 2011).

While it is very much evident that there is a need for better measurement of public sector innovation, it is less clear what types of measures would be most useful, or what aspects of

¹ See eg. OECD (2010), European Commission (2010), Danish Agency for Science, Technology and Innovation (2008), UK BIS (2008)

² In addition to this, some countries have published national results of their feasibility studies. See www.mepin.eu.

innovation in public sector organisations could be measured feasibly. The project has sought to keep both the issues of usefulness and feasibility in focus throughout the project.

Ensuring the usefulness of this data requires a detailed understanding of user needs. There may be a variety of different user groups from national and regional policymaking institutions, industry, trade and public sector organizations, research institutions, and others. And, for each of these there may be a broad range of potential uses for public sector innovation data, among these: benchmarking, individual project evaluation, monitoring, identifying good practices, analysis, positioning, and documentation.

In addition, a number of characteristics of user needs may influence the design surveys and indicators. Concerning policy needs, these include: type or authority of actor, type of instrument, type of goal, target population for action, time horizon, and reference group of action.

The structure of this report

This final synthesis report summarizes and assesses the work conducted in this project. Section 2 sets the stage by drawing out key insights on the public sector that impact how public sector innovation should be measured. This is based on a review of earlier work, but importantly also on empirical studies of users and respondents in the Nordic countries. Sections 3 and 4 present the measurement framework developed by this project. This includes both key definitions, the measurement of other important elements of public sector innovation, and main issues within survey methodology. The Nordic pilot study provides a platform to assess our measurement framework. Section 5 presents and critically assesses the main results of the pilot study, with a focus on what lessons can be learned. Finally, section 6 presents the main conclusions of the project and recommendations for future work.

3 Public sector innovation and the need for measures

This work has drawn both on extensive reviews of earlier studies and related literature and also on empirical work conducted by the project in the five Nordic countries. The development of the measurement framework that is described in section 3 has drawn in particular on four sources: existing theoretical and empirical studies, studies of users and respondents, and guidelines for measuring innovation in the business sector (the Oslo Manual, OECD/Eurostat, 2005). This section outlines main insights from existing theoretical and empirical studies, and project studies of users and respondents. It is worth pointing out that this is a fairly new research field with a relatively small number of studies and articles devoted directly to public sector innovation. For more detailed reviews of work in this area and other related strands of literature, see eg. Halvorsen et al. (2005), Koch and Hauknes (2005) and Mulgan and Albury (2003).

3.1 Some insights from theory

A fundamental feature of most public sector organizations is the lack of a market and thus also market incentives to innovate³. Hence, a first step here is to ask what are in fact the objectives of public sector organisations and what incentives and disincentives do they have to innovate?

Public sector objectives are often multiple and potentially conflicting. Public sector organisations are under pressure to cut costs and at the same time improve or provide new services or reach new users. Given limited resources, aims to target specific groups or to comply with regulations may come at the expense of other stakeholders. Public sector objectives are broad and often go beyond improving the direct performance or output of the organisation itself: for example objectives may also include improving the 'performance' of others; *i.e.* enabling innovation among citizens, business suppliers or other public sector institutions.

Kelly et al. (2002) identify three forms of value creation in the public sector: services, social outcomes and trust. Value creation in *services* may take place through increased efficiency, improved quality, user satisfaction, increased usage of services, greater equity (fairness) in service provision or greater choice or variety. *Social outcomes* such as social cohesion, equality,

³ This section draws on Bugge et al. (2010) and Bloch (2010).

reduced crime, poverty reduction, better educated population or improved health, represent central aims of public services. For many of these services there are no well functioning markets to provide services for those that need them. In this sense public activities can be seen as compensations for shortcomings in market economies. *Trust and legitimacy* are also identified as important public objectives, as they will influence on user satisfaction with public services and the public sector's ability to achieve broader societal goals. Among the objectives here are improved public perceptions of public service institutions, accountability of public service institutions in meeting public needs, and beliefs that public sector activities are aligned with stated societal objectives.

Innovation in the public sector and how innovation is perceived depends to a great extent on the nature of public services. There is also a great degree of heterogeneity in public services, where the differences among public units, both in terms of size, focus, objectives and outputs, are arguably even greater than for the business sector. For example, there are institutions providing services to individual users (which perhaps are those that most closely resemble business services), institutions providing collective services to all citizens, and administrative institutions providing services to other governmental organisations (which would reflect business to business services).

The public sector is very heterogeneous. This is of course also the case for the business sector, but this diversity is potentially greater for public sector organisations. In particular different levels of government and different types of outputs – both individual and collective services – play a large role. Three main dimensions for classifying organisations are sector (health, education, etc.), level of government (central, regional, local) and type of institution (policymaking/central administration, agency, frontline delivery).

In terms of level of government or types of institutions, there will be differences in kinds of activities or services they provide. Policy-making institutions (ministries) are arguably very distinct from other institutions, as are their main 'products', *i.e.* policies. Agencies and the administrations of regional and local governments will for the most part be less involved with the provision of services, but will have a large amount of process and organisationally oriented activities. However, there are likely many agencies or other entities in central government that provide services directly to users, be they citizens, businesses or other public sector organisations. And, finally, there is the group of frontline delivery institutions (for example, schools and hospitals) that are directly involved in the provision of public services to users.

The issue of heterogeneity is perhaps most relevant across sectors. The greatest differences here are in terms of objectives and measures of outputs, where both will have some elements that are specific to individual sectors. Though, there may also be a number of other aspects that vary across sectors, such as effects of innovations, barriers, specific organisational issues or types of collaboration.

The decision making and organisational structure that public sector organisations operate within are central in shaping the conditions for innovation. Such conditions may differ greatly from private businesses, and also vary across the public sector. Organisations are typically part of a complex organisational structure that impacts, both directly and indirectly, how organisations operate and innovate. This also includes rules and regulations that influence and in some cases dictate how organisations function. Individual organisations typically do not have full autonomy over many decisions, overall objectives, budgets and incentive structures. The implication is that external actors (in particular policy and other public organisations) will play a larger role in enabling innovation in individual public sector organisations than for a business. From a policy point of view, it also reflects a greater role for policy compared to the promotion of business innovation. Policy has a much larger potential to influence public sector organisations' innovation activities and enabling conditions than for the business sector.

An aspect of this is incentive structures, both for individuals and the organisation itself. A number of elements may act to shape incentive structures for staff and management, such as financial and non-financial rewards, explicitly identifying innovation as a goal of their work, allocation of time and resources to innovation, support from top management, and others. Many of these elements are also relevant for the organisation as a whole. Probably the most often mentioned disincentives for public sector organisations to innovate relates to budgetary conditions; *i.e.* organisations don't have an incentive to innovate because improvements in efficiency could result in a loss of funds.

3.2 Understanding user needs

In the Nordic project user needs⁴ have been approached through dialogue where users may be understood as both stakeholders and informants from national and regional policymaking institutions and representatives of industry, service and public sector organizations.

The main focus has been a two step approach concerning two initial meetings with users in Denmark, Finland, Norway and Sweden. The first meeting was intended to give some broad perspectives on user needs, whereas the second meeting was to gain specific feedback on a draft set of indicators by circulating the draft questionnaire. Countries took somewhat different approaches concerning the process around involving users, which reflects national priorities and approaches to stakeholder involvement.

The findings show that especially policy making, good practices, common understanding and benchmarking are of importance across the countries. Benchmarking is although not only across countries but has been mentioned by many as being especially interesting at a national level.

⁴ This section draws on Jørgensen (2010).

Likewise the issue of policy making has been at the forefront for users, and emphasis has also been attached to broadening the general understanding of innovation in the public sector.

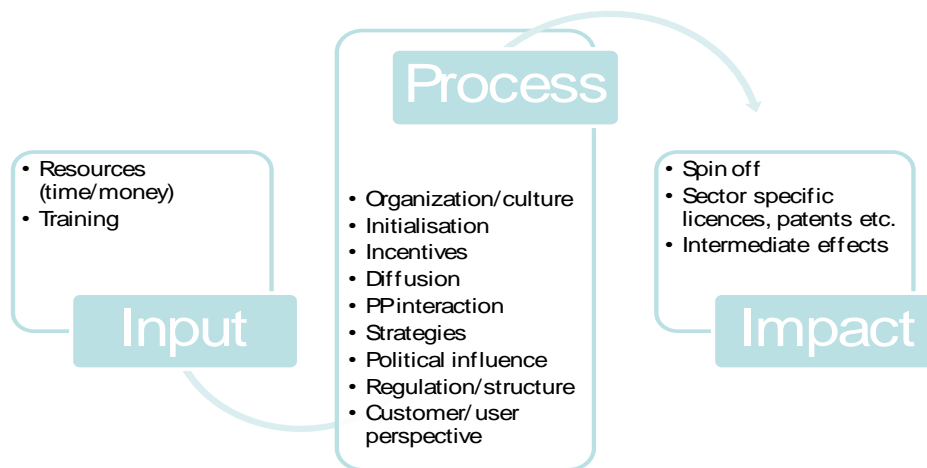
An additional 'finding' of this first round of meetings was that, while key users often had clear views on what was important about public sector innovation and why, it was very difficult at this early stage to articulate more concrete uses for public sector innovation data. Actual data and results are needed to look more deeply into potential uses of innovation data in policymaking.

Users in each country identified several drivers and barriers for public sector innovation. A number of these drivers or barriers were highlighted in particular. For example, there was interest in knowing more about the role of users as drivers of public sector innovation, and the role of suppliers (procurement). Political drivers and barriers were stressed as important given that policy can directly influence these factors. Political factors, broadly conceived, can affect innovations in a number of ways. Examples are new policies, regulations or policy orientations, and also changes implemented at a higher level in government that directly impact organizations at lower levels. In addition, the role of budgets and budgetary rules, along with incentive structures in general, were also cited.

The following figure shows different aspects highlighted by users to focus on in the measuring of public innovation when considering an input output relation. The input side was mainly an issue in Denmark, Sweden and Finland. Where Finnish users wanted to look at the monetary side (expenditures) Danish users suggested looking at time (personnel) instead, because it was seen as difficult to specify the economic investments in innovation in the public sector. In Sweden, users also mentioned training as an input element.

The process side includes a wide range of issues including how institutions organize their work and act in relation to innovation. Users from Denmark, Sweden and Norway mentioned interest in the initialization of innovation, incentives as well as the relevance of the framework, like rules and regulations. In relation to that, aspects concerning culture and risk aversion have been mentioned as well as organizations' ability to share and disseminate knowledge.

Regarding the impact/output side users in all countries found measures of innovative output important, however all also indicated that it could be difficult to define as well as create good and operational measures.



Source: DAMVAD, 2009

In all countries the issue of procurement was mentioned by users as interesting in relation to public sector innovation. Both Finnish and Danish users put little emphasis on ICT in terms of a detailed coverage. In Norway and Sweden the issue was of importance for some users.

In Denmark the general view was that the public and business sectors are very different that it might hard to know how to compare them. On the other hand, it was recognized that the understanding of key concepts should go across the public and private sector. In Norway users also saw a challenge in making comparisons due to the differences in the two sectors. On the other hand, Finnish users found comparability with the business sector to be essential. Likewise users in Sweden mentioned it as valuable.

3.3 Interviews and pilot testing with respondents in public sector organisations

In order to ensure the usefulness of public sector innovation metrics, it is vital that innovation surveys reflect how public sector organizations understand innovation and how innovation actually takes place⁵.

For this reason, interviews and focus groups were conducted with representatives of public sector organizations in all the Nordic countries. The goal of these interviews was to gain a better understanding of how respondents conceptualize innovation and how innovation can best be characterized in the public sector.

⁵ This section draws on Annerstedt and Björkbacka (2010).

The first phase of respondent studies consisted of interviewing representatives from the public sector regarding public sector innovation. The intention was to keep the concepts fairly 'open' in order to elicit greater feedback without imposing any preconceptions. Results from the first phase were used as input to other project modules and to draft a questionnaire. The second phase consisted of testing and discussing the draft questionnaire with a selection of potential respondents in each country.

All agreed that the concept of innovation is not well known and it is not understood by all in the same way. This makes it important with a general definition which is as unambiguous as possible.

All argued that the implementation was important, but did not need to be successful to be an innovation, but some expected that unsuccessful innovations would be omitted, unless asked for explicitly. Some on the other hand viewed success as a requirement for changes to be considered innovations.

Many innovations in the public sector are initiated by political initiatives, directly through laws and regulations or indirectly by budget- or man-power cuts. Most have agreed that the initiatives themselves are not innovations, but the changes derived could be. However, some questioned whether directly mandated (by policy, etc) changes would be considered by respondents as innovations.

The respondents mentioned different drivers and barriers when asked about the most important factors affecting the innovation. Risk aversion seems to be a central barrier for innovation, specifically if the institution has bad experience from previous innovation projects (failure). Scarce economic resources in general and for product development in particular are also negative factors. Bureaucracy and detailed regulation may also hinder innovation. Lack of coordination between interacting units from different levels within the same sector (i.e. between local and regional health services) was also mentioned as a barrier to innovation.

Lack of incentive to innovate for both management and staff seems to be a common barrier in public organisations. As mentioned above, there is a risk for failure working with innovations while the gains of a successfully implemented innovation often are not apparent. For example, successful innovation which leads to cost reduction may lead to less of public funding.

The role of the users could be to demand changes, but often they are also conservative (a lack of 'innovation readiness' on the part of some user groups can hinder innovations, particularly related to IT) and need to be made comfortable with the changes coming from the innovations.

Some respondents stressed the difficulties in accounting all resources, in-house expenditure and man-power, used in innovation activities. Others expected that accounting the in-house expenditure would not cause too much problems. Larger innovations would almost always be

organised as a project. For smaller innovation activities it is harder to account for the resources used.

Most respondents agreed that it is very important to measure the effects of innovations. However, all realized that it is difficult to make valid measurements. Many public organisations have some sort of output measures, but these are mostly specific for the type of services provided.

4 Conceptual framework – key definitions and concepts

This section presents the conceptual and survey framework that has been developed in this project and was used in conducting the Nordic pilot studies. This includes definitions of key concepts such as innovations and innovation activities, the additional elements of the conceptual framework and how we have measured these in practice, and the methodology used concerning survey-related issues such as classifications, population, units, and period.

The framework is based on extensive work conducted in the first stage of the project. See in particular Bloch (2010), Annerstedt and Björkbacka (2010) and Mortensen (2010) for discussions and analyses that lie behind the definitions, indicators and survey methods used.

The Nordic pilot studies that have been conducted in 2010 have been used to test this framework and provide a number of insights for future work. Where relevant, we will refer to the pilot study in order to provide an informative assessment of our framework, identifying both its strengths and weaknesses. Section 5 will thereafter provide a more detailed assessment of the results of the pilot study (see also the full report on the Nordic pilot study, Bugge et al., 2011), and section 6 summarizes and presents the project's recommendations for future work based on the pilot studies.

4.1 Key definitions

4.1.1 Innovations

The concept of innovation is operationalised both through an overall definition of innovation and the distinction of four individual types of innovations: product, process, organisational and communication. The main criteria used in forming the definitions are that innovations must have been implemented and that they constitute significant changes compared to existing

practices. In addition, definitions seek to take account for the nature of public services, which are often people-oriented and where product, process and other methods are less distinct from each other. The definitions also seek to maintain comparability with definitions used for businesses in the Oslo Manual.

As we will see below, a very high share of public sector organisations responded that they had implemented an innovation over the two year period surveyed. This can suggest that definitions should be made more restrictive in order to better exclude incremental or day-to-day changes. This is a central issue that will be discussed in detail below.

Definitions of innovation

*An **innovation** is the implementation of a significant change in the way your organisation operates or in the products it provides. Innovations comprise new or significant changes to services and goods, operational processes, organisational methods, or the way your organisation communicates with users.*

Innovations must be new to your organisation, although they can have been developed by others. They can either be the result of decisions within your organisation or in response to new regulations or policy measures.

*A **product innovation** is the introduction of a service or good that is new or significantly improved compared to existing services or goods in your organisation. This includes significant improvements in the service or good's characteristics, in customer access or in how it is used.*

*A **process innovation** is the implementation of a method for the production and provision of services and goods that is new or significantly improved compared to existing processes in your organisation. This may involve significant improvements in for example, equipment and/or skills. This also includes significant improvements in support functions such as IT, accounting and purchasing.*

*An **organisational innovation** is the implementation of a new method for organising or managing work that differs significantly from existing methods in your organisation. This includes new or significant improvements to management systems or workplace organisation.*

*A **communication innovation** is the implementation of a new method of promoting the organisation or its services and goods, or new methods to influence the behaviour of individuals or others. These must differ significantly from existing communication methods in your organisation*

The definitions of product and process innovations are similar to those in the Oslo Manual; though, with a less technical focus to better reflect public services. In addition, product innovations are divided into services and goods innovations. The project also considered limiting product innovations to service innovations only, but it was eventually considered best to include both types for completeness. In fact, the pilot study shows that a fairly high share of goods innovators, where the good innovation may often be an element in the provision of a service.

Process innovations are divided into three types: methods of producing services or goods, delivery methods, and supporting activities, which may often be related to IT operations.

In a broad sense, organisational innovations would appear to be fairly similar in the business and public sectors. However, there are differences in which terminology is most appropriate. The definition given above has a number of modifications compared to that in the Oslo Manual, though with a similar list of types of organisational innovations, which here include: new management systems, new methods of organising work responsibilities and decision making, new ways of organising external relations, and new systems for gathering knowledge and building innovative capacity.

Communication innovations attempt to take account of the fact that most public sector organisations do not operate on a market, but where promotion is nevertheless important for their operations.

Generally, there isn't a 'market' in the public sector. However, many respondents stated that promotion (i.e. marketing) is very important for their activities, and an area where innovative approaches are needed. The public sector is often just as reliant on good methods to launch and promote their products.

In addition, public sector organisations may make a number of campaigns or promotions that essentially don't provide a service to users. Their goal is instead to influence behaviour in some way. Is this a 'service' or a 'promotional campaign'? Some respondents considered this type of new initiative to be a service innovation, but most categorised it in terms of a marketing or communications innovation. Three types of communications innovations are identified: new methods of promoting the organisation or its services, new methods to influence the behaviour of user, and first time commercialisation of goods or services.

4.1.2 Innovative novelty

According to the definition above, innovations must be new to the organisation itself, but do not need to be new compared to other actors. Measures of innovative novelty have been used extensively in business innovation surveys, and provide an important means to distinguish between organisations that have introduced innovations that are 'adoptive' from those that are more 'inventive'. The Oslo Manual uses the concepts 'new to market' and 'new to the world' as measures of novelty. An alternative concept could be 'new to the sector' within which the

organisation operates. However, both 'market' and 'sector' are difficult to define for many public sector organisations, where many view themselves as unique operators within their area.

To avoid the problem of conceptualising these terms, we define two degrees of novelty without a specific reference group:

- **first to develop** and introduce the innovation
- the innovation already introduced by others, but **new for the organization**

Radical or disruptive innovations are related to the concept of novelty, and can be viewed as innovations that have a significant impact on a sector and on the activities of other organisations. This concept thus focuses on the impact of innovations, though it is clear that a radical or disruptive innovation will also involve a high degree of novelty. However, often it might not be apparent whether an innovation is disruptive until long after it has been introduced, making it more difficult to collect data on disruptive innovations.

4.1.3 Innovation activities

A second key element of the conceptual framework is innovation activities. These comprise the main inputs to the innovation process, but also provide information on the innovation process itself; i.e. what types of activities are being undertaken and also what types of work or technology is outsourced or acquired.

Innovation activities in the *Oslo Manual* are centred around the R&D concept – distinguishing between (intramural and extramural) R&D and non-R&D activities that are directly related to the development and implementation of innovations. For the public sector, the R&D concept may be less well-known and less central to many innovations, with a greater focus on non-technical activities. This raises the question of whether R&D should be singled out.

Definition of innovation activities

Innovation activities are all activities conducted in-house or externally through acquisitions which actually, or are intended to, lead to the implementation of innovations.

These include:

- In-house activities, such as in-house research and development (R&D); planning and design; market research and other user studies; feasibility studies, testing and other preparatory work for innovation
- Training and education of staff for innovation
- External R&D, other consultancy services for innovation
- Other external know-how (patents, licenses, etc),
- Acquisitions of machinery, equipment and software for innovation

The definition above does not break down in-house activities (though this can in principle be done), and places greater focus on non-technical activities.

An additional question, which would be relevant in particular for universities and other research-based institutions, is whether the definition of innovation activities should include all R&D. Basic research, and potentially also some applied research, can be argued to not fit within the definition, as they are not intended to lead to the implementation of innovations. However, this project has not specifically considered this issue, since research-based institutions were not part of our focus.

Quantitative measures of innovation activities are very difficult for many organisations to calculate, as they often do not have this type of data in their accounts. This has implications for the accuracy of this type of data. In some cases, a rough estimate may be very useful to assess the 'innovation intensity' of organisations, but in other cases, for example for productivity analysis, a lack of precision is more problematic. The main approach used in the Nordic pilot study was to ask for an estimate of total innovation expenditures within a set of intervals. The intention with this approach was that intervals would still give a rough estimate of innovation expenditures, but would be somewhat easier for respondents to provide. However, the results of this approach were mixed. The pilot study results on innovation expenditures are discussed in more detail below, and in Bugge et al. (2011).

4.2 Linkages

Public sector organisations' innovation activities can be influenced in a variety of ways by its relations to other actors. How organisations seek external information, cooperate with others, and diffuse their own innovative ideas, are characteristics that shape the innovation process. As discussed in Bugge et al. (2010), organisations may have a number of different interfaces with for example businesses, citizens and other public sector organisations. These three general types of interfaces may take on a variety of forms and place differing demands on the organisation in capitalising on them for their innovation activities. At the same time, the organisation's own innovation activities can impact the innovation of others. An example of this that has received increasing attention is innovative procurement; the use of purchasing to promote innovation in other organizations, in particular businesses.

A series of measures have been developed to capture these interfaces: information channels for innovation, innovation cooperation, innovative procurement, actors involved in the development of innovations, financial support for innovation, and innovation drivers.

4.2.1 Innovation cooperation

Innovation cooperation is active participation with enterprises or other public organisations on innovation activities. Questions on innovation cooperation have been extensively used in business innovation surveys and are outlined in the Oslo Manual. They are equally relevant for the public sector, though the list of sources or partners should be modified to fit the public sector. The following list has been used in this project:

- Enterprises suppliers (incl. consultancy services)
- Enterprises as clients / users
- Public organizations as suppliers (excl. Universities / gov. research institutions)
- Public organizations as Clients / users (excl. Universities / gov. research institutions)
- Universities / gov. research institutions
- Other public organisations
- Citizens as users, others

4.2.2 Information channels for innovation

Information channels instead focus on the channel by which knowledge is transferred, as opposed to the source. These information channels can thus be contrasted with questions on information sources, such as those used in the CIS. The main motivation for our focus on information channels instead of sources was to distance this indicator from that for innovation cooperation, allowing both the coverage of important sources of new knowledge (through cooperation) and other channels used to obtain new knowledge.

The following channels were identified:

- Internet and Online discussion forums
- User satisfaction surveys (or other user surveys)
- Networks, Conferences, seminars, other gatherings
- Hiring specialised personnel
- Evaluations (E.g. of quality, impact, efficiency)

4.2.3 Who developed the innovations?

Innovation cooperation can refer to cooperation at any stage of the innovation process and may or may not concern activities that are directly linked to a specific innovation. Questions that relate directly to the role of external actors and the organisation itself in developing innovations complement data on cooperation. The Oslo Manual outlines a simple breakdown of whether

(product or process) innovations were developed by the firm itself, together with others or mainly be others. However, for the public sector, policy needs suggest that there is great interest in identifying whether ‘others’ are private businesses, public research or other public sector organisations. Based on this, the following breakdown has been used:

- Mainly your own organisation
- Your organisation together with businesses
- Your organisation together with other public sector organisations
- Mainly by other public sector organisations or businesses

4.2.4 Innovative procurement

Public procurement is becoming an important issue for innovation policies, based on the idea that public procurement can be used to promote innovation in businesses. In terms of measurement, procurement can potentially impact innovation in two directions: contributions to innovation in the organisation itself and promoting innovation in other organisations. The measure developed here focuses on the impact of procurement on innovation in supplying organisations (businesses or other public sector organisations. ***Innovative procurement*** is defined as purchases that encourage the development of products or processes that do not yet exist or require new features. Measures of innovative procurement seek to measure the latter through a variety of practices:

- Acquisition of components or software from ICT-suppliers
- Acquisition of other machinery and equipment
- Contracting of consultancy services (ICT, management, user studies, other)
- Outsourcing of service provision
- Public-Private partnerships

4.2.5 Innovation drivers

There has been a large amount of focus on the drivers of innovation activities in public sector organisations, in part due to the fact that public sector organisations typically have less autonomy in their decision making and are thus subject to greater influence by external forces. Drivers can be either people, organisations or other factors that push organisations to innovate. Focus here is on ‘driving forces’ that push organisations to innovate as opposed to knowledge that organisations find useful for their innovation activities:

- Internal driving forces
 - Management
 - Staff

- Political forces
 - Mandated changes in budget for your organisation
 - New laws or regulations
 - Changes, innovations implemented in partner or higher level organisations (eg. new procedures or services, organisational changes, deregulation)
 - New policy priorities
- Public organisations
- Enterprises
 - As suppliers
 - As clients / users
- Citizens - As clients / users (i.e. feedback, complaints; influence from associations)

4.3 Objectives, effects and outputs

Objectives and impacts of innovations are at opposite ends of the innovation process; objectives are at the beginning and shape how innovation processes are conducted, while effects are the actual outputs at the end of the process. However, they both concern the same aspects, thus making sense to consider them together (where objectives can be considered as measures of intended outputs).

Effects are arguably more useful as measures for policymaking as they provide information on actual effects and not just intentions. However, effects may be difficult to answer for organisations, which in turn affect the reliability of these measures. First, due to time lags, effects may not have materialised within the reference period of a survey. Second, some impacts may require analysis and evaluation to discern whether they have actually taken place. Based on this, the project has placed focus on objectives, developing the following list:

- Address social challenges (eg. Health problems, inequalities, others)
- Fulfill new regulations, policies or other politically mandated changes
- Improve the quality of services or goods
- Increase efficiency (costs per service/good; reduced administration)
- Improve user satisfaction
- Improve online services
- Improve working conditions for employees

Given the lack of a common output measure (such as sales revenue or profits, etc), it would appear to be very difficult to construct generic quantitative measures that could be applied across different public sector institutions. Quantitative output measures are likely only possible for surveys designed for specific sectors, such as health, education or elderly care.

4.4 Innovation culture and barriers

The innovation process in a public sector organisation is also affected by its culture; for example, attitudes towards risk and change, incentive structure and perception of barriers to innovation. On a broad level, we can identify four elements of how the innovation process is organised in public sector organisations: first, the placement of innovation in the organisation's overall strategy (or business model); second, the role of management in promoting innovation in the organisation; third, the structuring of innovation processes; and fourth, the competences within the organisation. These elements work and potentially have different roles at different stages of the innovation process: initial generation of new ideas, the subsequent development of good ideas, and actual implementation of innovations.

- Innovation strategy and organisation
 - Specific goals/targets for innovation activities
 - An innovation strategy included in the overall vision or strategy of the organisation
 - Development department/section
 - Innovation activities organised as projects, steered by a dedicated group
 - Evaluations of the innovation processes conducted regularly
- Innovation management and staff
 - Managers give high priority to developing new ideas or new ways of working
 - Top management active in leading the implementation of innovations
 - Members of staff have part of their time devoted to development/innovation projects
 - Staff have incentives to identify new ideas and take part in their development
 - The staff is diverse in terms of background (demographic, educational)

Innovation activities are of course also influenced by the framework conditions that they operate under. The role of these factors can be measured by examining which factors act as barriers to innovation activities:

- Political factors
 - Lack of flexibility in laws and regulations
 - Lack of incentives for organisation as a whole to be innovative
 - Lack of budgetary funding
- Organisation and culture
 - Risk of failure
 - Lack of cooperation within your organisation
- Other internal conditions
 - Inadequate time allocated to innovation

- Lack of incentives for staff to innovate
- External conditions
 - Contractual rules hinder collaboration with suppliers
 - Lack of main suppliers' capability to provide innovative solutions
 - Resistance of users to changes

5 Survey methodology

Whether implementing a new survey or compiling indicators based on existing data, there are a number of statistical issues that need to be considered⁶. Issues such as identifying and defining statistical units, and determining the target population for conducting public sector innovation surveys have been among the most challenging for this project, and many open questions remain. This section discusses the main issues concerning survey methodology and general approaches that have been developed in the project. Section 5 describes briefly how the pilot studies were implemented in practice and draws some lessons for future work. See Mortensen (2010) for a detailed discussion of these survey-related issues and Bugge et al. (2011) for a description and analysis of methods used in the pilot studies.

5.1.1 Target population

In order to measure public innovation, one needs to identify what should be the target population. Should public innovation include all activities in the *public sector* or should it instead include *public services*, regardless of who provides them? There does not appear to be any commonly accepted definition of these two concepts, however we adopt the following definitions for this project:

*The **public sector** comprises the general government sector plus all public corporations including the central bank. (OECD, 1997, Measuring Public Employment in OECD)*

***Public services:** "General-interest services" are services considered to be in the general interest by the public authorities and accordingly subjected to specific public-service obligations. They include non-market services (e.g. compulsory education, social*

⁶ This section draws on Mortensen (2010).

protection), obligations of the State (e.g. security and justice) and services of general economic interest (e.g. transport, energy and communications). (EU-glossary; http://europa.eu/scadplus/glossary/general_interest_services_en.htm)

The concepts public sector and public services differ in that the public sector is defined in terms of ownership and control (essentially the SNA sector General Government plus other publicly owned or controlled entities) while public services are defined in terms of their functions or activities.

Public sector includes both general government and publicly owned organizations with non-market services/goods and market services/goods. The latter category of organizations is normally included in the innovation surveys for the business enterprises (CIS). *Public services* include both publicly owned and privately owned organizations that provide what are deemed as public services. This also includes public administration, but arguably the most central focus here would be on the types of services that are provided directly to citizens and businesses, and that can in principle be provided by both the public sector and businesses. And, targeting public services would mean that measures should be applicable both publicly and privately owned organizations.

In principle, several approaches are feasible, and much of the work conducted in this project is instructive for the development of different approaches. However, the focus of this project has been on the public sector organizations providing non-market (public) services.

As mentioned above, a main classification for delineating the public sector is the institutional sector (SNA), which can be further classified through types of activities (*e.g.* ISIC/NACE-classes).

In terms of ISIC (Rev. 4) and NACE (Rev. 2) classes, relevant categories can be placed in two groups. The first group comprises what can be considered the core groups of public services, *i.e.* the 2-digit ISIC/NACE-classes 84-88, 91⁷.

- 84 Public administration incl. security, defense, justice and compulsory social security
- 85 Education
- 86 Human health activities
- 87 Residential care activities
- 88 Social work activities, without accommodation
- 91 Libraries, archives, museums and similar cultural activities

⁷ The listed 2-digit classes are the same for ISIC Rev. 4 and NACE Rev. 2.

However, public services or government activities stretch over a wide range of other 2-3 digit ISIC/NACE-classes. These are generally within 'marketed services', but where the public sector typically has a large role. These can be grouped into classes that are typically covered by business innovation surveys (such as the CIS) and those that (while in principle are covered by the Oslo Manual) are not a part of the core industries (see Mortensen, 2010).

An additional classification that is relevant for the public sector is the Classification of Functions of Government (COFOG). Some of the functions listed in COFOG correspond to activity classes in ISIC/NACE, while others do not. A number of public sector statistics (for example, expenditures) may be compiled according to this classification, though business registers will typically not contain COFOG classification for units.

5.1.2 Statistical units

Being able to identify the desired statistical units and for that matter defining the ideal observation unit is important for data collection and compiling indicators. Yet, the complex organizational structure of the public sector may complicate both. According to the *Oslo Manual* (para 231): *"Ideally, innovation data should be compiled (and collected) at the organisational level for which decisions on innovation activity are made. Taking into account how innovation activities are usually organized, the enterprise is in general the most appropriate statistical unit."* These principles make good sense for private businesses, but it is somewhat less clear whether they are equally appropriate for the public sector. As we mentioned above, many public sector organizations may lack autonomy in their decision making, particularly concerning the allocation of resources. However, our interest in how innovation is generated and implemented in individual organizations may motivate focusing on units that only have partial autonomy. Furthermore, many public sector organisations are so large and complex that they may find it difficult to answer on behalf of the entire organisation.

An investigation of the Finnish and Danish business registers shows that neither the level of enterprises nor establishments seems to be fully able to identify the relevant units for a survey of public sector innovation (see Mortensen, 2010). For example, many municipalities and regional units are registered as one single enterprise and thus include many different types of public services, being too heterogeneous and big. Further, the enterprise classification appears to be used differently in the two countries. In all, there are 157 percent more Finnish than Danish governmental enterprises.

The fact that the structuring of the public sector and classification of units differ across countries should be expected, and to a certain extent can be likened to cross-country differences in the industry and size structure of business sectors. While these differences do not necessarily pose a

problem for international comparisons, it is nonetheless important to understand these differences and how they may influence results.

The establishment level seems also to be used in a very heterogeneous way in the government sector, i.e. one unit being the child minding after school at a certain school (Danish SFOs) with 5 employees and another unit being a university hospital with more than 1,000 employees. Also, one municipality has registered around 100 establishment units while another municipality of the same size has around 400. It may be expected that many of these units are too small to be considered as statistical units in a survey on public sector innovation, as decisions on innovation are not taken at that level. Other units, however, are probably too big. In the Danish business register there are 19,000 establishment units from the government sector (central, regional and local) while there are 32,000 establishment units in Finland, 60 % more than in Denmark.

What this means is that the ideal observation unit for public sector innovation indicators will sometimes be the enterprise unit, but often will also include establishment units. Examples of establishment units that might be considered relevant as separate units are hospitals and schools. This issue of the ideal observation unit is partially analogous to that for very large business enterprises, where the so-called kind of activity unit (KAU)⁸ has been suggested as the ideal unit. The KAU may also be preferable as observation unit for the public sector, particularly for large municipalities and other large organizations. Within the pilot studies, selected municipalities have been asked to collect data at the level of individual sectors (such as health or social care).

When the statistical units of the population are defined using the KAU-concept (Kind-of-Activity-Unit), the distinction between units **administering** services and units **producing** services is important. This brings in the considerations on which level(s) to survey. Experience from the pilot studies suggests classifying units by two levels:

- The administrating units of a public service
- The direct providers of a specific public service

⁸ **Kind of activity units** (KAU, see the Oslo Manual, §237), defined as “An enterprise or part of an enterprise which engages in one kind of economic activity without being restricted to the geographic area in which that activity is carried out”.

6 Results from the Nordic pilot studies

The Pilot study was conducted in all five Nordic countries Denmark, Finland, Iceland, Norway and Sweden, in the period between May and October 2010. The study was targeted at public sector institutions at both central and non-central (i.e. regional and local) level. The central level includes government institutions such as ministries and directorates, whereas the regional and local level comprises public sector actors such as municipalities, schools and hospitals⁹. In this report the two levels are referred to as central and non-central government respectively. Within both levels respondents included a) administrating units and the direct service providers. In most cases the questionnaire was answered by the top management of the institutions.

There are several methodical issues to be highlighted in a pilot survey like this. For instance, the reporting unit has been a central issue for the study: Who should the study be directed at? On behalf of whom should the respondent answer? Some municipalities have chosen to respond for all their sub-units, whereas others are responding for their single administrative units. Such problems may have affected the answers in the study. Section four provides an account for these types of issues and problems in greater detail.

Questionnaire

A common Nordic questionnaire was developed along the lines of the community innovation survey (CIS) which is measuring innovation in the private sector. However, through a preparatory study of user needs as well as an introductory feasibility study the questionnaire was adjusted to fit public sector contexts. Following the basic structure of the CIS survey the questionnaire sought to cover the topics discussed above in section 3.

There were some variations among the national questionnaire versions regarding some of the questions (see Bugge et al., 2011, for more details). Generally, Denmark, Iceland, Norway and Sweden followed the Nordic common questionnaire quite closely, while the questionnaire used in Finland differs more from the other countries. These national differences in how the questionnaire was made are the reason why some of the figures do not have numbers for all the five Nordic countries. Also, the data collection was gathered in various ways in the different countries. Whereas Iceland, Norway and Sweden collected the data by using an electronic questionnaire on the internet, Denmark and Finland collected the data through a postal survey. The questionnaire was first developed in English and then translated into national languages. As

⁹ In Iceland the situation is different as secondary schools and hospitals belong to the central level.

the different questionnaires in the various Nordic countries were all translated into separate languages, there may have been lingual differences between the questionnaires that may serve to affect how the questions are perceived and understood by the respondents.

Population and sample

A major challenge in conducting the pilot studies was selection of the survey frame. The starting point for all countries was the populations of enterprise (or legal) units within the general government sector. Selected units in a number of countries were excluded by manual sorting, based on an assessment of their relevance for this pilot study. In Finland, 90 units within central government were selected for the study out of 503 units. In particular, organisations such as district courts, execution authorities, various approving authorities and regional prisons were excluded from the sample.

Table 1: Description of samples used in the Nordic pilot studies

<i>Country</i>	<i>Level of government</i>	<i>Sample size</i>	<i>Details</i>
Denmark	Central government	158	Census, with manual sorting
	Regional and local government	446	Census of regions and municipalities (106); Census of hospitals (61), sample of upper level secondary schools (279)
	Total	604	
Finland	Central government	90	Census with manual sorting
	Regional and local government	208	Census of largest municipalities; sample of remaining municipalitites and associations of municipalities.
	Total	298	
Iceland	Central government	31	Sample
	Regional and local government	48	Sample including both municipalities and direct service providers (such as schools and hospitals)
	Total	79	
Norway	Central government	318	Census with manual sorting (except regional offices, which were sampled)
	Regional and local government	308	Sample of municipalities and hospitals, census of 20 largest municipalities
	Total	626	
Sweden	Central government	94	Sample
	Regional and local government	311	Sample of association of municipalities, municipalities and regional offices (211), sample of hospitals (100)
	Total	363	

Norway also excluded selected units from their population within central government (predominantly within defense, religious services and higher education). Denmark excluded a small number of units, mainly internal approval authorities. Iceland did not undertake manual sorting, but used a judgement sample for selected sectors¹⁰. Universities and units within defense were typically excluded from all countries.

Overall samples also included additional units from selected sectors. In Finland and Norway, subunits of municipalities (for example, within areas of health, social service and education) were also surveyed. A number of countries also included selected direct service providers in their samples. Norway, Denmark, Sweden and Iceland included hospitals and Denmark and Iceland included schools in their samples. The table below provides an overview of the samples used in each country. See also Bugge et al. (2011) for a more detailed description of populations and samples used in the surveys.

Response rates

The response rate is between 40 and 45 % for Denmark, Finland, Norway and Sweden, whereas Iceland had a higher response rate at 78 %. Apart from Iceland these are generally low response rates which underline the need to treat the findings with care.

Table 2: Overall response rate and sample by country. Percent and absolute numbers

	<i>Denmark</i>	<i>Finland</i>	<i>Iceland</i>	<i>Norway</i>	<i>Sweden</i>
Response rate (%)	42.0	46.3	77.6	44.7	45.2
Sample (N)	604	298	79	626	405

Given that these were pilot studies, none of results have been weighted to reflect the total population, nor have any imputation procedures been used.

The goals of the Nordic pilot studies were to test our measurement framework with respect to validity, potential comparability and usefulness. Hence, it is important to avoid overinterpretation of these results and they should not be considered suitable for benchmarking. The populations in each country are different, as countries explored different methods to address many of the challenging statistical issues for the survey, and some countries also experimented with the inclusion of special groups, such as hospitals and schools. In addition, given that this is a pilot study, a full validation procedure has not been employed. Finally, many

¹⁰ Note for the data collection in Iceland. For the central government, a census was taken of the largest institutions for Residential Care, Social Work and Culture & Sports. Judgement sample was applied to Education institutions, Health institutions and Technical & Environmental institutes. Finally, for other public service, a census was taken of the largest research institutes. For the municipalities, a census was taken of the five largest ones, with more than 13.000 inhabitants, while judgement sample was applied to the municipalities outside of the capital, yet excluding municipalities with less than 2000 inhabitants.

of the concepts used in this survey are very much new to public sector organizations. Despite extensive testing, we lack a full knowledge of how these concepts are understood by various respondents.

In order to better understand what types of innovations are being implemented in the public sector, respondents were asked to provide examples of innovations. The examples range across a large spectrum in terms of type of innovation, characteristics and novelty. The box below provides a few examples of innovations given by respondents in the pilot studies.

Examples of innovations from the Nordic pilot studies

Group therapy and training for depressed people at home using video

A new treatment for children, so called Multi-systemic Therapy (MST), which is provided within the environment of the family and local community. Replaces institutionally based treatment, i.e. the separation of the child from its parents.

New registration routine of crime reports received, which contributed to significantly fewer registration errors of criminal charges in the activities of investigative support.

Introduction of environmental ambulances

Campaign against false drugs

Use of PARO seal in residential homes (the PARO seal is a robot in the shape of a seal, able to move its eyes and make sounds)

Improved interdisciplinary cooperation between administration, nurseries and settling in schools

New logistical routines for acute operations

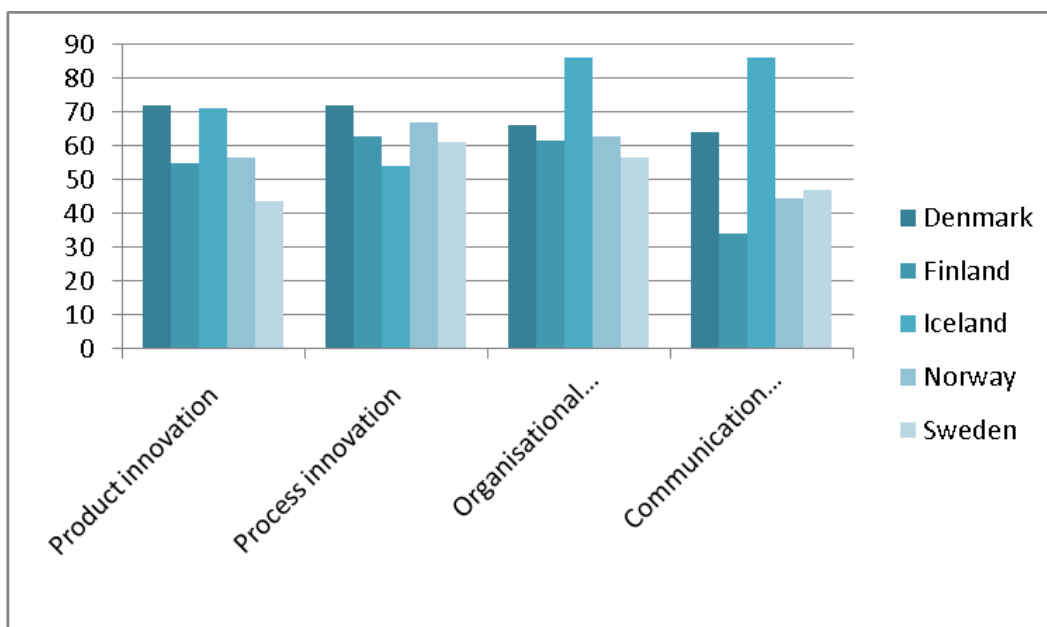
New service within child and youth services – various services/functions combined in one department, giving users seeking assistance a single ‘front office’

6.1 Innovation

Central indicators are the share of organizations with innovations; both overall and for individual types. For product, process and organizational innovations, results are fairly similar across countries, though with some exceptions. For example, shares with product innovation for Denmark, Finland, Iceland and Norway are between 55% and 72%, while the share for Sweden is

quite a bit lower, at 38%. Results are more similar for process innovation, and when looking at product-process innovation (either a product or process innovation), results range from 65% in Finland to 84% in Denmark. Given that it is often difficult to separate the actual product from the process (ie. the provision of the service) for services, the share with product-process innovations may be a more relevant measure than product or process innovations on their own. However, at the same time, the high shares with innovations adversely affect the relevance or policy usefulness of these indicators. Possible factors behind the high shares of innovators are discussed below.

Figure 1: Various types of innovations by country, 2008-2009. Percent



For organizational and communication innovations, Iceland is significantly higher than other countries. Otherwise, results range for the other countries from 50% in Sweden to 64% in Denmark. In contrast, there is large variance across countries for communication innovations. Finally, when looking at overall innovation, shares are very similar across countries: 78% for Sweden and Finland, 83% for Norway, 86% for Denmark, and 88% for Iceland.

Two main issues concerning these results are large differences across countries and the general high shares of organizations with innovation. We discuss each of these in turn.

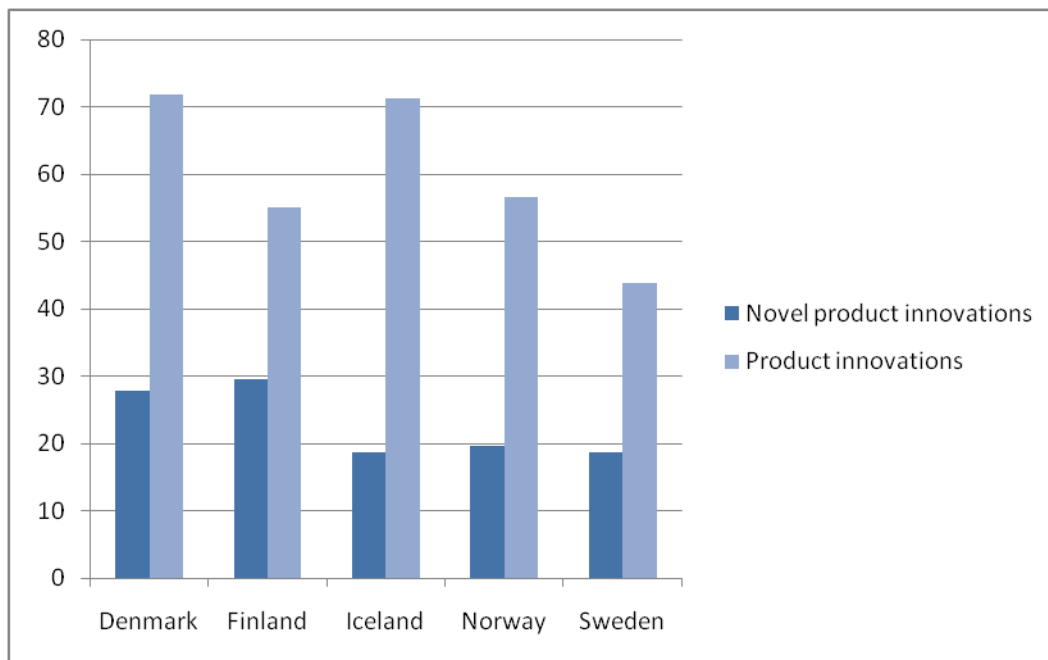
A priori, we did not expect large differences across the Nordic countries given their many common features. Hence, any large differences raise the question of to what degree the results are real and to what degree do they reflect problems with the comparability of results. Two possible factors at work here are differences in samples and different perceptions of the

questions. There are clearly differences in samples, as discussed above. However, this does not seem to provide a good explanation for the differences. For example, Denmark's high shares are fairly constant across subgroups, and the sample differences should work in Finland's favor, though Finland's results are similar to those in Sweden. So, while differences in populations and samples may very well have influenced the results, it does not seem likely that they are the main factor behind large differences.

A second possible factor concerns differences in interpretations of innovations. While great effort was made to ensure that respondents were presented with the same questionnaire across countries, we cannot rule out this factor fully. One very imprecise method of examining this is to assess the many examples given by each country. However, this does not reveal any clear evidence of differing interpretations across countries.

Shares of organizations with innovations are very high, both overall for all types and for individual types of innovations. The figure below shows shares with product innovations and shares with product innovations that are new compared to others (novel product innovations). The shares with product innovations are particularly high in comparison with innovative shares found in the business sector, which raises some serious questions on whether these results can be compared with those for businesses.

Figure 2: Novel and any product innovation by country, all government levels, 2008-2009. Percent



There may be a number of potential explanations for this result. We present here a number of possible explanations and discuss them in turn.

The definition of innovation for the public sector is more inclusive than the Oslo Manual definition for businesses. The definitions used in this project have been modified compared to those for businesses and in particular are less technical, to better capture the nature of public services. At the same time, efforts have been made to achieve a high degree of comparability. While we cannot rule out that these changes might have a slight impact on the share of innovative organizations, there is no strong reason why these changes should lie behind any significant differences in shares between the public and business sectors.

Public sector organizations interpret the concept of innovations differently than businesses, including many changes that are either borderline or should not be considered as innovations. This would appear to be a fairly plausible factor behind the high shares of innovations, however we are not able to confirm or discount this possible explanation based on project results.

Public sector organizations are on average very large in size. Hence, taking size into consideration, results are not that different from that for large businesses. An investigation of the data indicates that size is indeed a factor that affects these results, but it by no means provides the whole explanation. First, the majority of units in country samples have more than 250 employees. This is very high in comparison with business samples in CIS, where shares of large enterprises in Nordic populations are typically around 4-5%. Innovation shares for large units are also generally higher. For example, shares with process innovation for large (250 or more employees) units are around 74% for Finland and 73% for Norway¹¹, and for units under 250 employees 45% in Finland and 53% in Norway. Taking this into account, a higher proportion of large units impact overall shares with innovation. However, shares are substantially higher than comparable figures for businesses regardless of size class. As an example, from CIS4 (see OECD, 2009), shares with process innovations for SMEs and large enterprises are 26% and 60% for Finland and 18% and 41% for Norway.

Low response rates may introduce a bias in the results. The Nordic pilot study was a voluntary survey where, with the exception of Iceland, response rates were under 50 percent. If organizations with innovations are more likely to respond to the survey than organizations without innovations, then results will be biased upwards. We have not undertaken an analysis of non-respondents in the pilot studies, but it is indeed possible that response rates were higher for organizations with innovations.

The public sector as a whole is under constant change, which to varying degrees affects all organizations. Hence, public sector organizations in fact are more likely to implement 'minor' or incremental innovations that just barely fulfill the criteria for innovations. The explanation given earlier would essentially imply that some innovations do not actually meet the intended criteria (due for example to a lack of clarity in the definitions). Hence, a possible alternative explanation

¹¹ Though, it should be noted that data on number employees was not available for some observations in Norway, so these results are not based on the complete sample.

is that a greater share of public sector organizations has, in fact, implemented innovations. However we are not able to confirm or discount this possible explanation based on project results.

6.2 Innovation expenditures and personnel

Two questions were included in the pilot study to obtain quantitative measures of innovation activities: human resources involved in innovation activities and innovation expenditures. Pilot testing indicated that both these questions are difficult, but given their importance, it was decided to test them in the pilot study.

For human resources, respondents were asked to give the number of staff involved in innovation activities, along with full-time equivalents (FTE). The reporting on human resources involved in innovation activities had higher item non-response than most of the other questions, from 20-36% for FTE's and 7-24% for HC's. Among those that answered the question, results are somewhat similar across countries. For example, median shares of innovation personnel (compared to total staff) are 0.1 in Norway, 0.12 in Sweden and 0.18 in Iceland, and mean values are 0.23 in Norway, 0.30 in Sweden and 0.25 in Iceland. While the similarity in results is encouraging, the shares are higher than expected. This can potentially reflect differing interpretations of the question, where some respondents give the number of personnel affected by innovations, as opposed to the number actually involved in its development and implementation.

For innovation expenditures, respondents were asked to choose among the following categories:

- No expenditure
- Under 10K€
- 10K€ - 50K€
- 50K€ - 250K€
- 250K€ - 500K€
- 500K€ - 1 Mio.€
- 1 Mio.€ - 5 Mio.€
- 10 Mio€ or greater
- Expenditure unknown

Norway did not use the intervals and asked for actual amounts, while Finland asked respondent to provide actual amounts if their expenditures exceeded 10 Mio€. In addition, Finland did not include the option of answering that expenditure was unknown. Shares of respondents that either did not answer or ticked "expenditure unknown" were generally high. For the common specification of the question, non-response rates (including "unknown") were 25% in Denmark, 28% in Sweden and 46% in Iceland. In Finland, where the option, "expenditure unknown", was not included, non-response was lower, at 10%. In Norway where respondents were asked to provide the actual amount for expenditure, 68% either did not answer or ticked "expenditure unknown". The conclusion on the reporting of innovation expenditure is that it is highly

unreliable and that major changes are needed to improve the validity to a level where the information would be of any use.

In addition to quantitative measures respondents were asked what types of external innovation purchases were made (consultancy services; machinery, equipment and software; and other external knowledge) and from which types of sources (businesses, universities or other public service organizations). Based on pilot testing that revealed unfamiliarity with the R&D concept (and a very broad understanding of what R&D is), neither in-house nor external R&D was singled out in the common questionnaire. However, Finland included both in-house and external R&D separately and found that around 70% of respondents had conducted in-house R&D and around 55% external R&D. These high shares can possibly suggest a broad interpretation of the R&D concept.

Results are fairly similar across countries for the contracting of consultancy services (incl external R&D), with shares among innovative organizations ranging from 54% in Iceland to 73% in Norway¹². Shares with acquisitions of machinery, equipment and software are slightly lower. Acquisitions of external know-how (eg. patents, licenses) range from 15% in Iceland to 48% in Denmark. These shares were much higher than expected for non-research based public sector organisations, suggesting perhaps that ‘licenses’ were often perceived as any type of license (for example, to use a software program), as opposed to a license for use of a patent. Private businesses were by far the most common source of innovation purchases. However, a sizeable share also cited universities and other public sector organizations as suppliers. For example, concerning consultancy services, from 16% (Denmark) to 48% (Iceland) cited universities as a supplier and between 15% (Denmark) and 27% (Norway) cited other public sector organizations.

6.3 The role of ICT in public sector innovation

There is a substantial amount of policy focus on E-government and other forms of ICT-based innovation for the public sector. This motivates taking a careful look at how the role of ICT could be measured in public sector innovation surveys. Our work in this area is influenced to a large degree by efforts to balance between obtaining useful information on the role of ICTs in innovation while at the same time avoiding an over emphasis on technological aspects in the innovation survey. In general, project examination of user needs confirmed the strong policy interest in the role of ICTs. However, interviews with potential respondents where ICT is a central element in their innovation activities suggested that focus in promoting innovation should be on general innovation processes.

Given the above concerns regarding an excessive technological focus, we have not developed questions that seek to measure how advanced organisations’ ICT-capabilities are. However, this

¹² The list of innovation activities used in Finland contains different categories and thus is not fully comparable with the list used in the other Nordic countries.

remains an area of potential relevance if ICT is to be given extra focus in public sector innovation surveys. Instead, the pilot studies have sought to capture the role of ICT for innovation through a number of indirect questions, and also through the examples of innovations provided by respondents. An examination of the many examples provided found that the majority were ICT-related. Furthermore, ICT-related examples were provided within all four types of innovations. The box below provides a few examples of innovations from the Nordic pilot studies.

Examples of ICT-related innovations

IPPI - a communication system for the elderly and the disabled based on GSM and television teleCARE - a developed system of various components to improve safety alarms

E-service development of payment services

New registration routine of crime reports received, which contributed to significantly fewer registration errors of criminal charges in the activities of investigative support.

Development of a software solution to register place names on top of an aerial photograph database for specialists and the public.

Online procurement processes.

Results of medical checks given online from health center to service homes.

Development and implementation of new electronic patient journal system.

Results concerning process innovations also provide an indication of the prevalence of ICT-based innovation. In all countries, over half of product-process innovative organisations had implemented an innovation in their back-office supporting activities, with the highest shares in Norway and Sweden. These innovations typically will be ICT-based solutions¹³.

Improving online services was not cited as the most important objective – higher shares of organisations cited broader objectives such as increased efficiency, improved quality of services and improved user satisfaction as very important – however between 40 and 50% cited the improvement of online services as very important. Shares are typically higher for organisations in local and regional government, perhaps reflecting their closer contact to users.

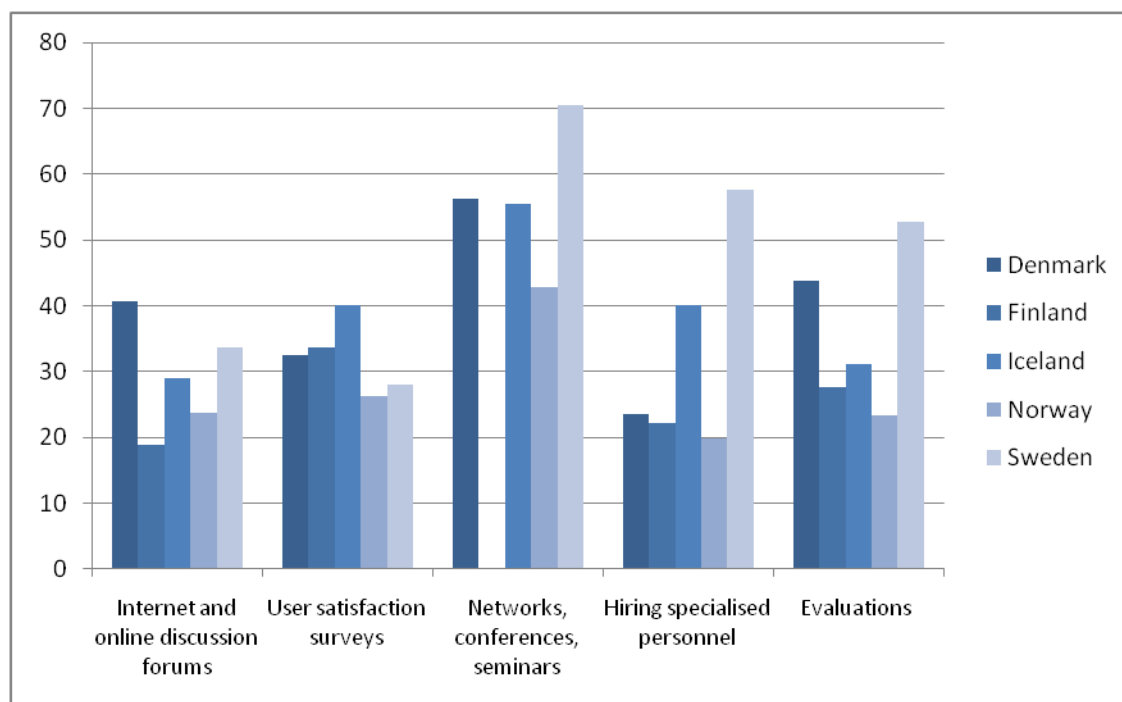
¹³ Denmark: 51%, Finland: 55%, Iceland: 51%, Norway: 72%, Sweden: 66%.

Organisations were also asked whether they used their procurements of ICT-based solutions to promote innovation in suppliers. Shares ranged from 15% in Norway to 20% in Denmark and Iceland, and 26% in Sweden. Generally shares were higher for the central government than other levels of government.

6.4 Information channels and innovation cooperation

Measures of the importance of information channels for innovation and innovation cooperation partners seek to capture two dimensions of linkages, the use of informal channels for gathering new knowledge and active cooperation with various external partners.

Figure 3: Information channels across countries. Percent



Among the five information channels listed (internet and online discussion forums, user surveys, networks and conferences, hiring specialized personnel, evaluations), the highest share cited networks and conferences as very important. However, a sizable share of respondents also view user surveys and evaluations as important channels to gather information on their innovation activities.

Around 20% in Norway, Denmark and Finland found hiring specialized personnel as an important channel, while the shares were much higher in Iceland and Sweden. As with other indicators, it

is difficult to discern whether large differences reflect actual differences, or instead different interpretations of the questions. However, this question is arguably very straightforward and it is perhaps not unrealistic to have large country differences in the use of evaluations or in the ability to hire qualified personnel within specific areas.

The shares of innovative organizations that had engaged in innovation cooperation were quite high in all countries, ranging from 51 and 59% in Norway and Iceland, to 72% in Denmark, and 83 and 84% in Finland and Sweden. The results provide an indication that most organizations involve external actors in some way in their innovation activities. However, these high shares suggest that respondents may have viewed the concept of innovation cooperation very broadly, including many external relations as long as they had some connection to their innovation activities.

6.5 Innovative procurement

As discussed above, we attempted to measure innovative procurement by first asking public sector organizations whether they had made purchases that encouraged the development of new products or processes (through specification of their orders, or by other means), and thereafter asking if specific procurement practices had been used to promote innovation.

Results are somewhat mixed for this question. Early stage testing showed that many respondents had difficulties in understanding the concept of innovation procurement, which led to a number of changes to this question. However, results suggest that there still may be some difficulties. For example, item non-response for the question on innovative procurement was around 15% in Denmark and 17% in Iceland. Sweden, Denmark and Iceland reported shares of between 40 and 50% of respondents that had innovative procurement, while the share was much lower for Norway, 16%. It is not clear what lies behind this difference.

An additional shortcoming concerns the format used in the questionnaire, which consists of an initial question asking on innovative procurement in general, followed by a question on the promotion of innovation in various procurement practices. However, the two questions are not fully in line with each other (some of the items in the second question are relevant even if one answers no to the first question)¹⁴.

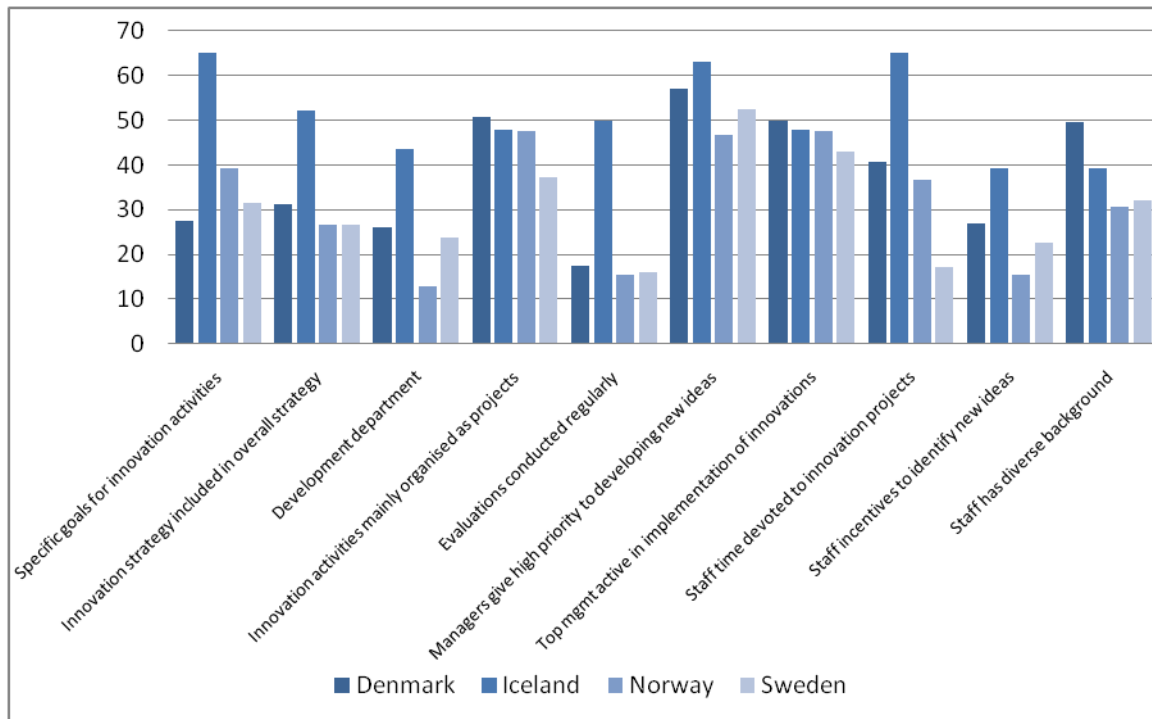
¹⁴ A copy of the questionnaire can be found in the appendix of Bugge et al. (2011).

6.6 Innovation strategy, management and organization

The question on innovation strategy, management and organization is among the most novel features of the survey, with the goal of gaining a better understanding of how innovation is organized and promoted in public sector organizations. However, measuring organisations' innovative culture is a difficult task. We examine briefly here the results and what types of insights might potentially be gaining from these types of questions.

Figure 4 shows the results for all levels for Denmark, Iceland, Norway and Sweden¹⁵. There appears to be a similar pattern across countries in terms of which practices are most prevalent (though, overall levels differ somewhat, particularly for Iceland).

Figure 4: Innovation strategy and management. Percent that highly agrees with the following statements. All government levels.



The highest shares concern the involvement of management and staff in innovation, for example management's role in implementation and whether staff is allotted time to innovation work. On the other hand, a lesser share offers incentives to staff to develop new ideas. Around a

¹⁵ The question on innovation strategy and management was not included in the Finnish survey.

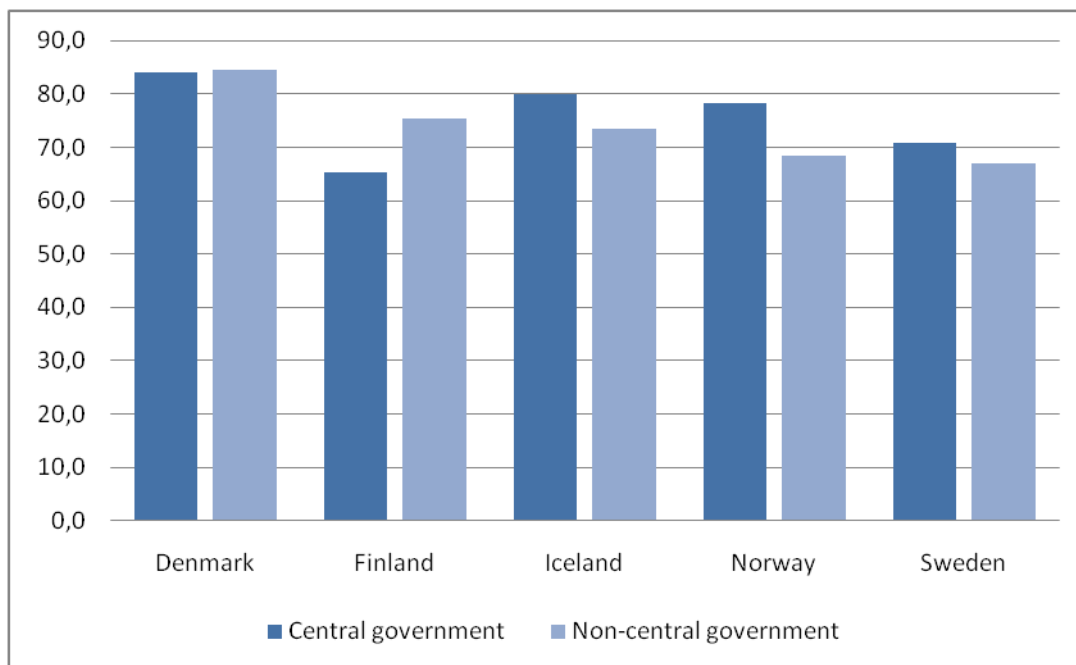
third of organizations set specific goals for their innovation and around the same share has an explicit innovation strategy. A lesser share has an actual department devoted to innovation, though a higher share organizes their innovation activities in projects.

6.7 Central and non-central government

In general, organizations that are part of central government may be quite different from municipalities or other organizations that are part of local or regional government. Pilot study results for these two groups – central and non-central government – are fairly similar with regard to main indicators, such as shares with innovation, but there are some larger differences concerning characteristics of innovations and other factors. In some cases, these differences are found for all countries, while in other cases, varying results are found.

Figure 5 shows shares of organizations with product-process innovations for central and non-central government. In Denmark, these shares are almost identical, while for Iceland, Norway and Sweden shares for central government are between 5 and 10 percentage points higher, and in Finland the share for non-central government is around 10 percentage points higher.

Figure 5: Product and/or process innovations for central and non-central government. Percent



While overall shares of product-process innovators are fairly similar across levels of government, central government has a higher share of novel innovations in all countries. For example, government level differences for novel product innovations range from 5% in Denmark to around 20% in Iceland and Sweden, and around 30% in Finland and Norway. Central

government is also much more likely to have collaborated with businesses in the development of their innovations.

Concerning objectives, a lower share of central government compared to non-central cited addressing social challenges as very important for their innovation (differences range from 14% to 22%) and a higher share (differences from 11% to 33%) cited improving online services as very important. However, the opposite result was found for Iceland in both these cases.

With the exception of citizens, shares with cooperation with external partners (businesses, public sector organizations) are higher for central government. This is particularly the case for international cooperation.

Budget changes are more often an important driver¹⁶ for innovation among non-central government organizations, while law changes are more important for central government. Higher shares within non-central government also cited businesses as users as important drivers.

For innovation strategy and management¹⁷, a higher share of central government organizations typically had an innovation strategy, innovation activities organized as projects, active role of management in innovation implementation, and staff incentives to innovate. On the other hand, there was little difference for shares concerning an innovation department and evaluations of innovation processes. However, the pattern is quite different for Iceland, where non-central government has a much higher share for all questions concerning innovation strategy and management.

6.8 Direct providers of public services within health and education

In Norway, Sweden, Iceland and Denmark, the pilot studies also included samples of direct providers of public services, which are sometimes referred to as front-line delivery institutions. All four countries included hospitals (or groups of hospitals, depending on how they are organized) in their survey, while Denmark and Iceland also included upper-level secondary schools. For all these groups, the questionnaire used was the same as for other public sector organizations. It should be stressed that the numbers of observations for these groups are low, which adds considerably to the lack of precision and exploratory nature of these figures. However, it is important for future survey work to make a preliminary assessment of how responses for health and education vary from results in general. We compare here results for surveyed institutions within health and education in non-central government with those of non-

¹⁶ Questions on innovation drivers not included in the Finnish survey.

¹⁷ Questions on innovation strategy and management not included in the Finnish survey.

central government overall¹⁸. The points below list some observations based on this comparison:

Health

- Shares with novel product innovations are around 10 percentage points higher for hospitals than non-central government in Denmark and Norway (there were too few observations for Sweden to make this comparison)
- Shares with product-process innovations are much higher for hospitals in Norway (18 percentage points higher than for non-central government overall), but fairly similar in Denmark and Sweden.
- For Sweden, Norway and Denmark, higher shares among institutions surveyed in the health sector find addressing social challenges, service quality and fulfilling regulations as important objectives, and lower shares for improving online services.
- Regarding information channels – user surveys, conferences and networks, hiring specialized personnel, and evaluations – a higher share of health institutions identify these as important in all three countries.
- A higher share of health institutions find almost all drivers important in the three countries.

Education (upper level secondary schools, Denmark only)

There is a general pattern among the majority of indicators, that a lower share of surveyed education institutions answered positively to questions in the survey:

- Lower shares with innovation
- Lower share with novel innovations
- Lower share innovations developed with businesses
- Lower share cites increased efficiency as a very important objective
- Lower share with cooperation with universities, and also with citizens
- However, much higher share with the use of outsourcing and public-private partnerships in order to promote innovation
- For strategy and management – a higher share cites management as active in leading innovation and supporting implementation, and that staff has incentives to innovate; lower shares for the other indicators concerning innovation strategy and capabilities

¹⁸ Due to the low number of observations (three hospitals and four secondary schools), we do not use in these comparisons the results for schools and hospitals in Iceland.

7 Conclusions and recommendations for future work

This final section summarises and provides recommendations for future work on public sector innovation measurement. We first discuss key issues concerning survey methodology and indicators, and thereafter outline possible next steps for broader international work in this area.

Target population

The pilot studies demonstrate the challenges in defining an appropriate target population for public sector innovation surveys.

The pilot studies demonstrate the challenges in defining an appropriate target population for public sector innovation surveys. Should surveys cover the whole public sector, public services (public or private providers) or a limited set of sectors/organisations?

The main focus of the pilot study was organisations within general government. The next question was how to select organisations to participate in the survey. The basic approach followed by the Nordic countries was to use business registers and consider public sector units that are classified as enterprises, along with additional units within selected sectors, such as hospitals and schools. Differences were found across Nordic countries in the types of organisations that are registered as enterprises (or legal units), and some of these units were not considered relevant for a survey of this type. These differences are likely to be even greater when considering a larger and more diverse group of countries. Additional work is needed to examine the quality of business registers and to compare across a wider set of countries.

Guidelines are needed to promote the harmonisation of target populations across countries. However, at the same time, a certain degree of variation should be expected and can also be considered acceptable due to different organisation of public services in countries. The Nordic pilot studies did not find a large degree of variation in main indicators (such as the share of innovative organisations) for subgroups within individual countries. This may suggest that moderate differences in the composition of target populations may not have a significant impact on overall results. Furthermore, it should be kept in mind that a substantial degree of variation in industrial and size composition is also present in business enterprise sectors across countries.

Classification of units

Four of the countries have used the National business register to identify (gross) population frames, using the institutional sector and – to a lesser degree – NACE-classes of the core service groups.

The primary focus of the Nordic pilot studies has been on enterprises or legal units within the public sector. Here it was found that the large majority of units are within a single industry, public administration, which thus means that NACE classifications are of little help in classifying organizations. Establishment level units (such as schools) on the other hand typically have a clear NACE code in business registers. However, the number of establishment units is very large (for example, around 30,000 in Finland and 19,000 in Denmark) and not all of these units could be considered relevant for a survey of this type.

However, it seems obvious that if a common public sector innovation survey is to be conducted among the European countries under the auspices of Eurostat, then the recommendation would be to use the business register to identify the units to be included – thus increasing the pressure of improving the quality of the business register regarding public units. In the future, the option of using functional breakdowns should also be investigated. I.e. in addition to classify units according to sector or industry; ask for breakdowns of variables of units into industries or services provided using COFOG or NACE.

For the time being, this lack of an adequate method to classify organizations means that some manual sorting is needed. Also some investigation for valid units not included as enterprise or establishment units in the business register might be needed.

Statistical units

The size of the units responding differs very much, the smallest units consisting of 5-7 employees and the largest 5.100/8.500/68.000 (data from IS, SE, NO). The same differences are found in the business innovation surveys, and it is seen as a problem (re. the discussion in the Oslo Manual) for many of the topics in the questionnaire and when the large units have activities in more industries.

For public sector innovation, these problems can be regarded as even greater, as the share of large units is much higher. The large public units might probably better be seen as mediators (reporting unit) as was organised in Sweden and Finland for some of the municipalities, letting the respondents (statistical units) be Kind-of-Activity-Units of the large public unit.

Survey respondents

Identifying the right respondent is a crucial issue already discovered in testing the questionnaire. Special attention has to be paid to the motivation of respondents. Filling in the questionnaire is often the result of co-operation between several employees. For the survey agency it is difficult to find out the right respondent. It is recommended that at least for the biggest municipalities an attempt is made to predetermine the respondents to the survey

Heterogeneity of public sector organisations

A much discussed issue concerning the measurement of public sector innovation is the heterogeneity of public sector organisations. Is it possible to conduct a harmonised survey across such a wide range of organisations? The results of the Nordic pilot studies suggest that this is generally feasible. When examining results across subgroups for individual countries, the general picture given by the study is that shares for main indicators (eg. Innovations) are quite similar while there are more significant differences in measures of how organisations innovate. Though many respondents found the questionnaire difficult to answer, there is no firm indication that specific groups found the survey less relevant to them than others. This suggests that it is possible to use a 'generic' questionnaire across different types of organisations, and to capture eventual differences in innovation within this common framework.

However, this does not mean that a differentiation of questionnaires may not be useful in some cases. In particular, for specific groups of institutions, such as hospitals or schools, it would be beneficial to supplement a core set of questions with modules of questions that target specific aspects relevant to the group in question. It might also be beneficial to test the use of slightly different questionnaires across broad subsectors or levels of government. Examples here are including examples that are specifically relevant to the group in question, or removing individual questions that are deemed less important for a specific group.

Innovations

Shares of innovative organizations are very high. There may be a number of possible explanations for this result, for example that these measures also include day-to-day incremental changes or upwards bias due to higher response rate among innovation active organisations. Given that diffusion is important, it is very relevant to include innovations that are only new to the organization (but exist elsewhere). On the other hand, in order for this measure to be useful, they must reflect substantial changes that matter for the organisation's operations.

The usefulness of these indicators would be enhanced both by making the definitions more restrictive and potentially also introducing measures that allow the classification of innovations (where novelty is an example). At the same time, these changes should not be too drastic. A

pragmatic approach would be to consider moderate changes (that may in themselves have a large impact). Some possible approaches that can be considered are the following:

- Change the reference period to just one year. Many of the respondents interviewed suggested that the reference period should be only one year instead of the two-year period used in the pilot studies. However, it is unclear how large an influence this would have on results.
- Greater emphasis that innovations must constitute significant changes
 - Slightly strengthen the wording of the definition
 - Include examples (also of changes that should not be considered innovations)
 - Require that innovations constitute a significant change in the organisation's overall operations.
 - Require that they be from formal innovation projects
- Examine whether very large statistical units can be broken down into kind-of-activity units.

The heterogeneity of statistical units also needs to be addressed. The usefulness of indicators will depend greatly on the existence of harmonized procedures to identify the target population and define statistical units.

Measuring inputs to the innovation process

The pilot study results for quantitative measures of innovation personnel and expenditures were not particularly encouraging. Results seem fairly plausible for the number of innovation personnel, though there may have been different interpretations of what to include (personnel that are directly involved in the development of innovations vs. those that are affected by the innovation). The question on innovation expenditures had both high item non-response and diverging results across countries. However, in both cases, we view it worthwhile to continue work with these indicators. Innovation personnel can be better clarified to ensure a common understanding of the concept. Concerning innovation expenditures, it would be helpful both to reconsider the definition of innovation activities, perform closer analysis of existing results, and act to ensure that the respondent is reporting innovation expenditures for the same unit for which the overall operating budget is reported (for example, asking for overall budget amounts at the same time). Future work can also include further examination of public sector organisation's perception of the R&D concept. In addition, experience with business innovation surveys suggests that respondents' understanding of innovations and innovation expenditures increase over time as they become more familiar with the concepts.

Innovative procurement

The project has tested a number of different formulations concerning innovative procurement, with mixed results. However, the final definition of procurement used in the pilot study appears

to have worked well, as evidenced by low item non-response rates and similar results across countries (though, an exception here is Norway). The questions employed here can, along with formulations used in other projects (and the alternative formulation used in Finland), be taken up for consideration, in particular with respect to their usefulness to ongoing policy work in this area.

Innovation cooperation

The data on innovation cooperation tell us that a large majority of respondents engages in some form of collaboration with external partners, and also indicates which types of partners are most important. However, this information would likely be of greater value if the focus was tightened to limit to more substantive or formalised collaborations. This could be done by making the definition of innovation cooperation more restrictive.

Information channels, innovation drivers and innovation culture

The pilot study included some questions that were relatively new for innovation surveys, also for business innovation surveys. This includes questions on information channels for innovation, on innovation drivers, and on innovation strategy and management. While additional analysis would be helpful to assess these questions, our view is that these questions worked well and provide useful information on how public sector organisations innovate. We recommend that future surveys continue to cover these topics, building on those used in the pilot studies.

Objectives, effects and outputs

The question on innovation objectives appeared to work well in the survey. Generally, the broad objectives of improved efficiency, quality and user satisfaction were the most common objectives. However, arguably, some of the more specific objectives are more informative and provide greater opportunity to distinguish different types of innovators. Hence, this question could potentially be improved by a greater focus on specific objectives.

Effects and impact measures are also very important. Some questions on these were tested in this project, but encountered difficulties and ultimately were not included in the final questionnaire due to space considerations¹⁹. However, given the high policy importance of these measures, it is important to revisit these topics in future work. This includes both expected effects and the scope of innovations (share of organisation affected by the innovations). Some examples can also be found in related studies (EU Innovation Barometer and NESTA Public Sector Innovation Index).

¹⁹ However, Norway and Sweden both included a question that asked whether stated objectives had been achieved.

An international agenda for further development

A central aim of this project is to contribute towards the development of international guidelines for the collection of data on public sector innovation. The development of guidelines would provide an opportunity to make a detailed assessment of this and other related initiatives, and how they can contribute to international guidelines. In addition, international guidelines are needed to help ensure a degree of comparability.

At the same time, future surveys, potentially taking many of this project's recommendations and lessons into account, can build on the work undertaken in this project. There is also a need for greater knowledge from a broader set of countries concerning many survey related issues. Among these are: the basic structure of the public sector across a wider range of countries (such as those of the OECD or EU); investigation of the quality and coverage of business registers; comparison of business registers and other registers; and examination of other classifications or the correspondence between NACE and COFOG classifications.

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