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# Public sector innovation—From theory to measurement<sup>☆</sup>

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### ABSTRACT

While there is growing awareness that much innovation currently takes place in the public sector, it is also recognised that more systematic efforts to promote innovation are needed to address the economic and societal challenges that public sectors face. However, there is a lack of a common understanding of what public sector innovation is and a lack of a measurement framework that can shed light on innovation processes in public sector organisations. Based on insights generated in a recent Nordic pilot study, this paper seeks to contribute to fill this gap. The paper discusses how public sector innovation can be captured and to what extent measurement can be based on frameworks originally developed in a private sector context. While there are important differences between the public and the private sector that should be reflected in a measurement framework, there is also considerable common ground that can be drawn upon.

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## 1. Introduction

While there is a growing awareness that much innovation currently takes place in the public sector, it is also recognised that more systematic efforts to promote innovation will be needed to maintain high levels of welfare services and help address the economic and societal challenges that public sectors face (Borins, 2001; Koch

and Hauknes, 2005; Eggers and Singh, 2009; European Commission, 2011). However, there is still a lack of an adequate framework for understanding and measuring innovation in the public sector (Koch and Hauknes, 2005). Based on the insights generated in a Nordic pilot study on the development of a measurement framework for innovation in the public sector, this paper seeks to contribute towards filling this gap.

Studies of innovation in private companies have greatly improved our understanding of the processes underlying innovation and social and economic change in modern economies. However, there has been a tendency to consider the public sector as something quite different from the private sector in terms of innovation, often stemming from a perception of the public sector as providing a regulatory framework for innovation in the private sector, and as a passive recipient of innovations from the private sector (Windrum, 2008). Although the public sector can be attributed important innovative breakthroughs like the internet, public sector institutions have often been seen as conservative and bureaucratic. Literature on public sector innovation has so far been scarce (Mulgan and

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Albury, 2003; Bommert, 2010), though it appears to have been growing in recent years.<sup>1</sup> Still, work on public sector innovation from related disciplines can be used to help form a theoretical framework for public sector innovation. Research on service innovation and systems of innovation will therefore be used as a backdrop for the discussions on how innovation can be measured in the public sector. The paper also draws on Gallouj and Djellal (2010)'s typology of demarcation, assimilation and integration, which was originally developed to discuss the relationship between innovation in manufacturing and services, as a starting point for considering whether innovation in the public sector can be measured with the same framework as for innovation in the private sector. To what extent is innovation in the public sector similar to innovation in the private sector, and where is it different? Is it possible to develop a new joint approach to innovation across the public and private sectors?

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 EU.<sup>2</sup> This paper addresses the need for systematic data, discussing the development of a theoretical framework and indicators for measuring innovation in the public sector. More specifically, the paper examines the following questions: First, what characterises innovation in the public sector? Second, what conceptual framework should be employed to guide the measurement of public sector innovation? Third, what approach should be used for measurement? The discussion will be based on an examination of the results from the recent pilot study Measuring Public Sector Innovation in the Nordic countries (MEPIN).

The paper is structured as follows: Section 2 outlines a theoretical basis for understanding innovation in the public sector. Section 3 discusses some central notions concerning the public sector and their implications for measurement of innovation. Section 4 briefly presents the structure of the Nordic pilot study and its methodology. Section 5 discusses the results of the MEPIN study. Finally, Section 6 concludes and presents some avenues for future research.

## 2. Theoretical underpinnings of public sector innovation

So far there is a limited theoretical literature that focuses specifically on public sector innovation (Mulgan and Albury, 2003; Bommert, 2010). Furthermore, much of the existing work is not based on empirical investigations. However, despite the scarcity of literature on innovation in the public sector, the insights derived from other strands of theory may be relevant and help shape thinking about public sector innovation (Koch and Hauknes, 2005). Three areas are important towards forming an understanding of how public sector organisations innovate: the nature of public

services themselves, the context that public sector organisations operate within, and the interfaces with other actors both within and beyond the public sector.

### 2.1. Innovation in services

The majority of modern economies are constituted by services (Miles, 2005; Gallouj and Djellal, 2010). Services can typically be characterised by intangibility,<sup>3</sup> simultaneity of consumption and production, and customisation to the individual client or user. These characteristics may influence both how organisations innovate and also how innovation can be measured.

However, there is a great variety of activities within services (Tether and Hipp, 2002; Tether, 2003; Miles, 2005), and they may not always be easy to isolate or distinguish from other (economic) activities (Gallouj and Weinstein, 1997). Services have traditionally been seen as subordinate to goods, in part due to a perceived lack of ability for up-scaling of analogue services. However, digitisation of services greatly enhances the possibilities for up-scaling and growth. Services may also add value to or constitute the main source of value in goods (Gallouj and Djellal, 2010), e.g. the design of fashion clothing.

The complex relationship between goods and services may also be paralleled by a similarly interwoven relationship between gradual improvements and radical breakthroughs. Arguments have been made that small, incremental changes have an important role for service innovation, both for the private and public sector. Recent case studies in health care examine the importance of incremental, and in some cases unintentional, changes for innovation in the public sector (Fuglsang, 2010; Fuglsang and Sørensen, 2011). In these studies, event-based, informal, disorganised day-to-day-practices of problem-solving and ad-hoc adjustments are contrasted with other forms of more deliberate, formal, radical and systematic change processes. Whereas it is easier to identify intended, formalised and well-defined change activities as innovations, the more incremental “bricolage” activities may similarly also add up to innovations over time. In both types of change, the structure of the services is changed in a reproducible way. However, it is emphasised that there is a challenge to acknowledge and to link the bricolage activities with more systematic innovation activities.

### 2.2. Public sector and innovation systems

Literature on the systemic nature of innovation comprises various perspectives and traditions such as the learning economy (Lundvall and Johnson, 1994), national innovation systems (Lundvall, 1992; Nelson, 1993), regional innovation systems (Cooke, 1992; Asheim and Isaksen, 1997), technological innovation systems (Teece, 1996), sectoral innovation systems (Breschi and Malerba, 1997), industrial districts (Marshall, 1890), clusters (Porter,

<sup>1</sup> Examples here are Osborne and Brown (2011), Fernandez and Pitts (2011) and Salge and Vera (2012).

<sup>2</sup> See e.g. OECD (2010), European Commission (2010), Danish Agency for Science, Technology and Innovation (2008), UK Department of Business (2008).

<sup>3</sup> Though, this is not always the case. For example, some services are in fact tangible where production and consumption can be separated, e.g. IT, public libraries, parks, hospitals, and environmental services.

1998), triple helix (Etzkowitz and Leydesdorff, 2000), open innovation (Chesbrough, 2003), and user-driven innovation (von Hippel, 2005). Innovation systems theory stresses that innovation does not occur in isolation, but depends upon the interplay between many different types of actors that take part in and play various roles in an innovation process. It is often in the relations *between* actors and their respective knowledge bases that innovation occurs, through re-combinations of existing knowledge (Schumpeter, 1934 (1959); Weitzman, 1998; Johansson, 2004). Indeed, there are several factors in the institutional surroundings of the innovation system that shape the conditions for innovation within it (North, 1990). These institutions may be either formal or informal and include elements such as laws, regulations, cultural norms, social rules and technical standards (Edquist, 2005).

Perhaps with the exception of triple helix these perspectives are developed with a primary focus on the private sector, and the public sector often plays a secondary role. However, due to the growing attention and awareness of the need for public sector innovation, there is a potential for expanding the roles of the public sector in these approaches.

More recent theoretical work on the systemic characteristics of innovation in the public sector includes networked governance (Hartley, 2005), community governance (Hess and Adams, 2007) and collaborative innovation (Bommert, 2010; Sørensen and Torfing, 2011), and is primarily oriented at societal outcomes (Hess and Adams, 2007). Also emphasising the public–private interlinkages, Hipp (2010) predicts closer collaborative arrangements across the private and public sector. The notion of co-creation (Bason, 2010) is also central within the paradigm of collaborative innovation.

The many interfaces of the public sector and its various contexts can influence innovation in the public sector in different ways, and understanding these can also be important for measurement. Drawing on a systemic approach to the public sector, a number of interfaces can be identified: (1) between the public sector and the private sector (including publicly owned enterprises); (2) between the public sector and citizens; (3) interfaces across governmental levels within the public sector, i.e. policy formulation, public administration and service production, (4) the interface between the various geographical levels of the public sector (i.e. local, regional, national) and (5) interfaces across different public domains, (e.g. health, education and defence). Some of the governmental levels in the public sector (i.e. the policy level and the administrative level) do not always provide services directly to the private sector or to citizens; rather they provide the political and regulatory frameworks and the implementation of these into the various types of public services. These interfaces are important for understanding public sector innovation, its diffusion, and the role of different sets of other actors.

In sum, in managing their innovation activities, many public sector organisations need to navigate through a number of internal and external actors, potentially with limited autonomy in overall decision-making and where incentive structures may vary greatly across organisations.

The decision making and organisational structure that public sector organisations operate within are thus 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.

### 2.3. From private to public sector

As most production in the public sector is associated with service production, a number of characteristics of services in general may also apply to public service providers. However, there are also important differences between public and private services, and also many differences among public services themselves. For example, there are institutions providing services to businesses, to individual users, to all citizens, and administrative institutions providing services to other governmental organisations.

At an overall level, a number of factors distinguish the public from the private sector in terms of innovation. A key difference is that public sector organisations in principle do not operate in a market based framework and are thus not driven by profit-seeking motives. The users of public services have in many instances no possibilities of replacing the service provider with other providers. Indeed, due to a belief that the private sector is more innovative or effective than the public sector there has been a trend towards ‘privatisation’ of the public sector implying the introduction of quasi markets in the public sector often referred to as New Public Management (Hood, 1991). Also associated with the lack of an actual market is that the public sector has societal objectives which may require other incentives, drivers and barriers to innovation than the private sector.

Reflecting its objectives at both the organisational and societal level, 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, greater usage of services, greater equity (fairness) in service provision or greater choice or variety. *Social outcomes* such as social cohesion, equality, wealth distribution, safety, poverty reduction, better educated population or improved health, represent central aims of public services. *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.<sup>4</sup>

<sup>4</sup> Resembling Kelly’s typology, Bason (2010) operates with four types of value creation in public sector innovation; productivity, service experience, results and democracy, where the two former refer to the organisational level and the latter two refer to the societal level.

As public sector service provision often revolves around both providing services cost-effectively and creating societal wellbeing, value in the public sector is more complex than in the private sector and can therefore be harder to measure (Mulgan and Albury, 2003; Kelly et al., 2002).

In addition to potential conflicts between objectives within an organisation, innovation can also have various forms of both positive and negative outputs and outcomes. For example, surveillance cameras in public places may help to reduce crime, but it can at the same time undermine the legitimacy and trust in the public sector. This illustrates how objectives, value creation and outcomes in the public sector are complex and multifaceted. Another implication of this is that measuring one kind of output should often be seen in relation to other forms of outputs or outcomes in order to reflect how the various aspects are often integrated and woven together. For the business sector, standard output measures exist (sales, value added) that go across all sectors. These do not exist for the public sector, complicating the development of ways to measure the innovation performance of public sector. Given the multiple objectives for public sector innovation, any one measure of output may fail to capture the full effects on performance.

Risk aversion or the fear of failure has often been assumed to be a key barrier to innovation in the public sector and also to be one of the largest contrasts between the public and private sector in terms of innovation (Koch et al., 2006; Koch and Hauknes, 2005). The assumed difference between the public and private sector is that firms have to take risk in order to survive on the market, while public sector organisations have less to gain from taking risks and less to lose if not taking risks. Also, the risks for unsuccessful innovation may be larger for the public sector due to the media and opposition parties (Borins, 2001). In the private sector there has also been a culture for rewarding successful innovation, whereas this is less common for the public sector (Borins, 2001).

Diffusion of innovation is another area where there are important differences between the private and the public sector. Whereas innovation in the private sector is sought to be protected from copying by others in order to increase the benefits of temporary rents from monopoly, for the public sector it may be the opposite. Here diffusion of innovation across the public (and private) sector may ensure a better use of public resources (Moore, 1995; Mulgan and Albury, 2003; Rolfstam et al., 2011).

### 3. From theory to measurement

The discussion in the previous section highlighted a number of characteristics that are important to take into account when attempting to understand how innovation in the public sector takes place and how it may be supported and measured. So far research on public sector innovation has tended to follow two streams. Either it has emphasised how characteristics from private sector innovation are also applicable to the public sector, or it has concentrated on how the public and private sector are different (Arundel and Hollanders, 2011). This section moves closer from theory to measurement by examining approaches to the measurement of public sector innovation.

#### 3.1. Application of existing frameworks for understanding the new

In the innovation literature it has been discussed to what extent and how innovation in (private) services differs or is similar to innovation in manufacturing (Gallouj and Weinstein, 1997; Gallouj and Djellal, 2010; Gallouj and Savona, 2010). The question is to what extent the two should be seen as similar (the assimilation approach) or distinct (the demarcation approach), or whether they share characteristics that may be captured in a common framework (the integration approach). In more recent work, Djellal and Gallouj (2012) apply this methodology to the public sector and ask whether public services should be seen as different or similar to private services.

Transferring existing knowledge from other theoretical strands or previous studies onto new fields implies seeing and interpreting “new” activities through the lens of “old” ones. In this sense the old activities and narratives become the standard against which the new ones are being benchmarked. This can be unfortunate to the degree that this may undermine the full picture of the unique characteristics of the new. It has been emphasised that it is important to develop new knowledge that is specifically targeted at understanding the characteristics of public sector innovation (Hartley, 2005; OECD, 2012). The demarcation approach addresses such a need, illuminating the unique capabilities of innovation in public services (Djellal and Gallouj, 2012). The demarcation approach has also been taken one step further through the notion of an inverted approach in which the insights on the specificities of innovation dynamics in the public sector are used to challenge traditional perceptions and frameworks for understanding innovation in the private sector (Djellal and Gallouj, 2012).

Parallel to the adjustments and improvements in our conceptual frameworks to grasp and understand the dynamics of public sector innovation the basis for innovation dynamics in society are also continuously changing. The challenge to develop a measurement framework for public sector innovation is in this sense further complicated by a moving target for the measurement efforts. Technological advances and maturation in IT often referred to as web 2.0 (Constantinides and Fountain, 2008; O’Reilly, 2005) can be seen as a development that contributes to redefining the rules of the game for value creation in the private and public sectors and among citizens. Notions such as crowd-sourcing (Howe, 2008) and co-creation (Bason, 2010) or wiki-government (Noveck, 2009) enabled by interactive technologies allow citizens to become active and engaged in policy formulation and societal production. Possibilities for the elderly to monitor their own health condition and to feed their own health data into public health registers, or for consumers to contribute to an advertising campaign by uploading their home-made video onto a campaign site or spreading digital messages and images among friends are examples that illustrate how value creation is no longer confined to the public and private sector alone.

When developing indicators and a measurement framework for measuring innovation in the public sector it is also important to be aware of the potential impact that

indicators may have on human behaviour. Measurement structures tend to heavily influence behaviour and governance structures (Gjørup et al., 2007; Nissen, 2007): If e.g. the police are funded on the basis of the number of burglars caught, they have no economic incentives to reduce the number of crimes committed. Similarly, when the funding schemes for hospitals imply differentiated payment for various illnesses, the hospitals are likely to prioritise the most economically rewarding diseases and this may even affect diagnosing (Butenschøn, 2012). In order to ensure that public sector activities address their societal objectives in addition to its goals at the organisational level, it is therefore important that these are all reflected in the measurement framework for the public sector.

### 3.2. What is innovation in the public sector?

What is innovation in the public sector? How does innovation in the public sector differ from innovation in the private sector? Establishing an 'operational' definition of innovation in the public sector is an essential element for data collection and indicator development.

A number of examples of definitions of public sector innovations can be found in the literature. For example, Moore et al., 1997 defines public sector innovation in terms of novelty and the degree of change in relation to the organisation: "*Changes worth recognising as innovation should be... new to the organisation, be large enough and durable enough to appreciably affect the operations or character of the organisation.*" This is a very general definition, but it puts particular focus on criteria for when a change is significant enough to be considered an innovation; this is not in terms of novelty compared to other organisations, but changes need to be significant in terms of the organisation's overall operations.

According to Mulgan (2007): "*The simplest definition is that public sector innovation is about new ideas that work at creating public value. The ideas have to be at least in part new (rather than improvements); they have to be taken up (rather than just being good ideas); and they have to be useful.*" In terms of measurement, a criterion that an innovation is "useful" requires that enough time has elapsed that an assessment of impact can be made. Hence, this is problematic for measurement of recent innovations. Mulgan's (2007) definition includes an implementation element that innovations need to have been "taken up".

The Oslo Manual (OECD/Eurostat, 2005) defines innovation in the business sector as "*the implementation of a new or significantly improved product (good or service) or process, a new marketing method, or a new organisational method in business practices, workplace organisation or external relations*" (para. 146). The main elements of the definition, that an innovation should be new or significantly improved and that it should be implemented, can thus also be found in definitions of public sector innovation.<sup>5</sup> Gault (2012) considers whether the Oslo Manual definition could be made

more applicable for measuring user innovation by firms and consumers, and for public sector innovation. The main obstacle here is the link of implementation to the market, in particular that product innovations must have been introduced on the market (OECD/Eurostat, 2005, para. 150), while other types of innovations must have been taken into use. Gault (2012) suggests defining the implementation of new or significantly improved products by whether they are "made available to potential users" (Gault, 2012, p. 123), which could allow the Oslo Manual to be applicable for both users and public sector organisations.

As is the case for the Oslo Manual definition for the business sector, a number of different types of innovations can be identified. Windrum (2008) proposes the following typology of public innovations, which draws on Koch and Hauknes (2005)<sup>6</sup>:

- *Service innovation*
- *Service delivery innovation*
- *Administrative and organisational innovation*
- *Conceptual innovation*
- *Policy innovation*
- *Systemic innovation*

*Service innovations* are the introduction of new service products or improvements of existing service products. *Service delivery innovation* is new ways of delivering services to and interacting with the users. *Administrative and organisational innovation* involves introducing new organisational principles for the production and delivery of service products. *Conceptual innovation* is "*the development of new world views that challenge assumptions that underpin existing service products, processes and organisational forms*" (Windrum, 2008). In terms of an individual organisation, this would refer to a change in the overall strategy or the organisation's societal objectives. However, a drawback in terms of measurement is that a new strategy does not necessarily imply an implementation of changes. *Policy innovations* are new policy concepts, and can either be due to policy changes, or changes in policies, new programmes or large reforms. *Systemic innovations* "involve new or improved ways of interacting with other organisations and knowledge bases." These may be related to organisational changes or conceptual innovations (and would essentially be included in the definition of organisational innovation used in the Oslo Manual for businesses).

These definitions share a number of common elements with the definition of innovation in the business sector, but also some important differences. For example, the notions of conceptual and policy innovations reflect how the public sector differs from the private sector. There is also a greater tendency to describe innovations in more general and less technical terms than for the business sector. However, it should also be noted that the basic elements of an

<sup>5</sup> An additional element is that innovation should be new or significantly improved for the firm itself, but not necessarily for others (OECD/Eurostat, 2005, para 148).

<sup>6</sup> Koch and Hauknes (2005) propose the following overall definition of innovation: "*Innovation is a social entity's implementation and performance of a new specific form or repertoire of social action that is implemented deliberately by the entity in the context of the objectives and functionalities of the entity's activities.*"

innovation, that innovations must be significant changes for the organisation and that they must be implemented, are the same for both sectors.

#### 4. Methods

This section describes briefly the MEPIN study, upon which this analysis is based. The objective of the Nordic research project “Measuring public sector innovation in the Nordic countries (MEPIN)” was to develop a measurement framework for collecting internationally comparable data on innovation in the public sector, which would both contribute to our understanding of what public sector innovation is, how public sector organisations innovate, and to develop metrics for use in promoting public sector innovation (Bloch, 2011). A key element of the project was a large scale pilot survey conducted in all five Nordic countries (Denmark, Finland, Iceland, Norway and Sweden).

During the initial phase of the project, a number of interviews were conducted with representatives of public sector organisations and policy users (Annerstedt and Björkbacka, 2010). Both users and respondents were asked how they understood innovation and also how they viewed the four types of innovations in the Oslo Manual (i.e. product, process, organisational and market innovation); whether each type was relevant and whether they thought other types of innovations should also be included. In general terms, the four types of innovations were viewed by respondents as relevant for the public sector, though definitions required modification to better suit the public sector. This thus motivates the definitions developed in the MEPIN study, which are included in the appendix. Main changes here were changing marketing innovations to communication innovations and modifying all four definitions to better reflect the nature of public sector services and processes. 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. Organisational innovations 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. In addition, public sector organisations may make a number of campaigns or promotions that essentially do not provide a service to users. 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.

Examples provided by respondents in the Nordic pilot study span across all four types of innovations. Examples of product innovations are robot vacuum cleaners in nursing homes for elderly, environmentally friendly ambulances, 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 a new IT solution for joint login to public services which enables switching between various public services without

new login for each service, and self-service in the personnel and payroll system. Organisational innovations include the ‘Family House’; an interdisciplinary cooperation to provide a single ‘front office’ for users, in this case children and youth in the municipality. And, examples of communication innovations are international marketing of educations, a campaign against counterfeit drugs, and notification to citizens by SMS to reach citizens with information.

A common questionnaire was developed for use in all five Nordic countries. However, there were some variations among the national questionnaire versions regarding some of the questions. The approach used was to take the basic framework from the Community Innovation Survey (CIS) for the business sector as a point of departure (assimilation), but to use modifications or different approaches where needed in order to fit public sector contexts (demarkation).

To a certain degree, all questions were modified to fit the public sector context. For some questions, changes were fairly minor, while others were new questions developed for the survey or with major changes to fit the public sector. Questions with minor changes include:

- Innovations (though with communication innovations instead of marketing innovations).
- Innovation activities and expenditures.
- The objectives of innovations (though, including societal objectives).
- Innovation cooperation.
- External funding for innovation.

Questions that were specifically tailored to the public sector context are:

- Innovation drivers and barriers.
- Information channels for innovation activities.
- Innovation strategy and capabilities.
- Innovative public procurement.

The Pilot survey was conducted in all five Nordic countries Denmark, Finland, Iceland, Norway and Sweden in 2010. The survey was targeted at public sector institutions at the central, regional and local levels. The central level includes government institutions such as ministries and agencies, whereas the regional and local level comprises public sector actors such as municipalities, schools and hospitals.<sup>7</sup> In most cases the questionnaire was answered by the top management of the institutions.

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 after an evaluation of their relevance for this pilot study.<sup>8</sup> Universities and units within defense were typically excluded from all countries.

<sup>7</sup> In Iceland the situation is different as secondary schools and hospitals belong to the central level.

<sup>8</sup> 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

**Table 1**

Description of the samples used in the MEPIN pilot studies.

Country	Level of government	Sample size	Response rate (%)	Details
Denmark	Central government	158	42.0	Census, with manual sorting Census of regions and municipalities (106) and hospitals (61), sample of upper level secondary schools (279)
	Regional and local government	446		
	Total	604		
Finland	Central government	90	46.3	Census with manual sorting Census of largest municipalities; sample of remaining municipalities and associations of municipalities.
	Regional and local government	208		
	Total	298		
Iceland	Central government	31	77.6	Sample Sample including both municipalities and direct service providers (such as schools and hospitals)
	Regional and local government	48		
	Total	79		
Norway	Central government	318	44.7	Census with manual sorting (except regional offices, which were sampled) Sample of municipalities and hospitals, census of 20 largest municipalities
	Regional and local government	308		
	Total	626		
Sweden	Central government	94	45.2	Sample Sample of association of municipalities, municipalities and regional offices (211), sample of hospitals (100)
	Regional and local government	311		
	Total	405		

Source: Bugge et al. (2011).

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. Table 1 above, taken from Bugge et al. (2011) provides an overview of the samples used in the MEPIN pilot studies.

## 5. Lessons from the MEPIN study

The MEPIN pilot study generated a number of insights that both add to our understanding of public sector innovation and how it can be measured, but also pose a number of issues for further work. In this final section, we draw on the results from the pilot study to examine the implications for measurement of innovation in the public sector.<sup>9</sup>

### 5.1. Innovation rates, novelty and collaboration

Table 2 presents a range of results from the MEPIN pilot study concerning innovations, sourcing, cooperation and objectives. Results for each country are shown separately for units that are part of central government and all other

prisons were excluded from the sample. Norway also excluded selected units from their population within central government (predominantly within defence, 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 sectors.

<sup>9</sup> The complete empirical results and methodological framework of the survey can be found in Bugge et al. (2011).

units, which include regional and central government along with hospitals and schools. Shares of organisations with innovations are very high, both overall for all types and for individual types of innovations. Between 80% and 90% of the respondents in the five Nordic countries stated that they had had at least one type of innovation during the last two years (2008–2009). The shares with product innovations are particularly high (ranging from 38% to 72%) in comparison with innovative shares found in the business sector, which raises some questions concerning whether these results can be compared with those for businesses. Within central government, shares with product innovation are over 70% for Denmark and Iceland, and around 60% and 50%, respectively, for Norway and Finland, while the share for Sweden is quite a bit lower, at 38%. Results are more similar across countries for product–process innovations (either a product or process innovation), with results ranging from 65% in Finland to 84% in Denmark. Given that it is often difficult to separate the actual product from the process (i.e. 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.

For organisational and communication innovations, shares for Iceland is significantly higher than other countries. In general shares with organisational innovations are higher for non-central government, while for communication innovations, shares are higher for non-central government in Denmark and Sweden and lower in Finland, Iceland and Norway.

Generally around 20% and 30% of all respondents stated that they were the first to introduce the innovations. The results thus provide an indication that a high share of organisations are innovative, but the large majority are based on

**Table 2**

Results from the MEPIN pilot study – Innovations, sourcing, cooperation and objectives, 2008–2009 (in percent).

	Denmark		Finland		Iceland		Norway		Sweden	
	Central govt.	Other								
<b>Innovations</b>										
Product innovation	71.6	72.0	51.9	56.7	72.0	70.6	61.4	50.9	38.2	45.8
Product innovation new compared to others	30.1	26.6	39.5	24.7	28.0	11.8	31.2	10.9	21.0	16.6
Process innovation	71.6	72.0	57.7	66.0	60.0	50.0	72.3	59.4	65.5	58.0
Process innovation new compared to others	22.0	19.3	N/A	N/A	20.0	17.6	27.7	10.9	23.1	12.2
Product or process innovation	84.1	84.5	65.4	75.3	80.0	73.5	78.2	68.5	70.9	66.9
Organisational innovation	61.4	69.0	57.7	63.9	80.0	91.2	60.8	62.4	50.0	59.3
Communication innovation	60.2	66.1	40.4	30.9	88.0	85.3	52.5	35.2	40.7	49.6
<b>Sourcing R&amp;D or consultancy services</b>										
From private businesses	52.1	37.4	N/A	N/A	36.4	46.9	81.4	50.1	65.2	42.5
From universities, governmental research	10.7	11.3	N/A	N/A	9.1	37.5	30.2	26.5	17.4	17.2
From Public service organisations	5.8	11.7	N/A	N/A	13.6	12.5	18.6	18.4	15.2	14.2
Innovative procurement	47.7	44.6	53.5	48.1	57.9	42.3	20.7	12.4	39.1	39.8
<b>Innovation cooperation</b>										
Any cooperation with the business sector	58.0	42.3	N/A	N/A	61.5	44.4	72.7	53.8	76.3	74.6
Universities, governmental research	12.5	17.9	N/A	N/A	23.1	38.9	34.1	29.5	47.4	37.3
Other public organisations	17.0	14.3	N/A	N/A	30.8	38.9	25.0	11.5	63.2	61.2
<b>Innovation objectives</b>										
Address social challenges	14.8	36.3	N/A	N/A	52.4	34.6	13.8	27.7	25.5	44.1
Fulfil new regulations	48.9	48.2	34.2	24.7	57.1	46.2	54.0	44.6	42.6	37.3
Increase efficiency	61.4	58.3	62.5	52.7	76.2	76.9	79.3	66.9	70.2	67.6
Improve quality of services	75.0	79.2	43.6	53.4	85.7	84.6	85.1	80.8	63.8	79.4
Improve user satisfaction	68.2	70.2	55.0	71.2	90.5	80.8	77.0	66.2	66.0	75.5
Improve online services	53.4	38.7	62.5	51.4	38.1	53.8	57.5	24.6	61.7	43.1
Improve working conditions	50.0	57.1	N/A	N/A	47.4	50.0	55.2	38.5	34.1	51.0

Source: MEPIN pilot study (Bugge et al., 2011). Results provided by Statistics Denmark, Statistics Finland, RANNIS, Statistics Norway and Statistics Sweden. Note: Results based on a pilot study with the purpose of testing and learning from the collection of innovation data in the public sector. The data should not be considered as official statistics, nor should it be considered suitable for benchmarking. Results based only on responses, and are not grossed up to the full population.

N/A, not available.

Innovations – percentage of all organisations that have implemented each type of innovation. Sourcing – share of all organisations with innovation activities that have purchased R&D or consultancy services from the listed sources. Innovative procurement – share of all organisations that have used procurement to promote innovation by their suppliers. Innovation cooperation – share of organisations with innovation activities that has had innovation cooperation with the listed types of partners. Innovation objectives – share of organisations with innovation activities that have listed the objective as highly important.

diffusion and the adoption of innovations from other organisations. Differences across government level are in some cases quite large concerning innovative novelty, typically with much higher levels within central government. This suggests that central government institutions tend to have more novel innovations whereas non-central government institutions tend to have more incremental innovations. If correct, explanations for such a pattern can potentially reflect the relative dependence of non-central government institutions on central government institutions.

There may be a number of potential explanations for the high shares of innovations reported. A first possible factor is that public sector organisations might interpret the concept of innovations differently than businesses, particularly concerning when a change is and is not an innovation. The notion of innovation is relatively new in the context of the public sector, which also may lead to different interpretations of the terminology. This is difficult to confirm based on the survey results, but could be examined through cognitive testing. Second, the share of large organisations is higher in the public sector than in the business sector which, given that large units are more likely to be innovative, would lead to higher innovative shares. Third, low

response rates may introduce an upwards bias in the results if organisations with innovations are more likely to respond to the survey than organisations without innovations. A fourth possible factor is that if the public sector as a whole is under constant change, then public sector organisations may continuously need to adjust to a changing environment or be frequently required to make changes based on new regulations or policies.

Results indicate that a fairly high share of innovative public organisations purchased research and development or consulting services from businesses in connection with their innovation activities. However, shares vary greatly across countries and government levels, which might suggest differences in perceptions of the R&D concept. Results indicate though that this is generally not a passive purchase of innovations from suppliers. Only about a tenth of organisations with product innovations have had an innovation which was primarily made by others, suggesting that it may be difficult to develop public innovations without any active participation of the public organisation. This view is also supported by the results that between 42% and 76% of innovative organisations had collaborated with businesses to develop their innovations. A smaller share of

organisations also collaborated with universities or with other public sector organisations.

Public sector organisations may use procurement to spur innovation outside of their own organisation. An important question is thus to what extent public organisations consciously incorporate innovation potential in their procurement decisions. Results of the pilot studies indicated that between 40% and 50% of public organisations actively considered the promotion of business innovation when planning purchases. Interestingly, shares are significantly lower for Norway, though we were not able to identify possible sources of this difference.

As Table 2 shows, the most common objectives for innovation activities in all the Nordic countries are 'increased efficiency', 'improved goods and services' and to 'improve user satisfaction'. Nonetheless, around half of the respondents in most countries have stated that an important objective for their innovations is to fulfil new regulations. This suggests that regulations can have a significant impact on stimulating innovation. Addressing social challenges is relatively low, but still considerable, and higher for non-central government than for central government. It should also be kept in mind that this is a fairly broad and indirect objective and respondents may have had difficulties in interpreting it.

### 5.2. Drivers and barriers

Results on drivers suggest an important role for politically mandated innovations (Table 3). Around 60% of organisations cited political drivers as highly important for their innovation activities. However, internal actors were given high importance by an even higher share of organisations (around 80% for management and around 70% for internal staff). This suggests that, while public sector organisations may not have full autonomy, at least part of their innovative activity is based on internal decision making and staff ideas.

As Table 3 shows, 'lack of funding', 'inadequate time' and 'lack of internal incentives' are emphasised as the three most important barriers to innovation. Risk aversion is traditionally assumed to constitute another central dividing line between the public and private sector. However, risk does not appear to be as great a hindrance to public sector innovation as traditionally assumed. This contradicts findings in earlier studies in which risk aversion has been pointed out as a key barrier to innovation in the public sector (Koch et al., 2006; Koch and Hauknes, 2005). Also worth noting is that Iceland has far higher percentage rates than the other Nordic countries.

To get a better understanding of how public organisations work with innovation, respondents were asked a series of questions about how innovation is organised in their organisations. In Denmark, Norway and Sweden between one third and one fourth stated that their organisation has specific goals for their innovation activities and that it has developed an innovation strategy that is included in their overall strategy. Nearly half of all respondents say that their innovation activities are mainly organised as projects and that top management gives priority to new ideas and is active in implementation of innovation. These

results suggest that for a significant share of public sector organisations, innovation is an integral part of their organisational plans and strategies. However, shares of innovative organisations are much higher than shares that have specific innovation goals or strategies. Hence, for the majority of innovative organisations, it would appear that innovations are responses to specific problems or challenges, and less a part of long term or overall strategies.

### 5.3. Challenges for survey methodology

There are a number of challenges concerning the statistical methodology for public sector innovation measurement. These include defining the target population, identifying the statistical units to examine, and classifying these units within the population. 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 organisational structure of the public sector may complicate both. Many public sector organisations 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 organisations may motivate focusing on units that do not have full 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. More work is also needed to delimit the population among public sector organisations. This includes which government levels to include, but also on what types of organisations or sectors should be included (and how this can be done in a harmonised way across countries).

A much discussed issue is the heterogeneity of public sector organisations and implications for measurement. When examining pilot survey results across subgroups for individual countries, the general picture given by the study is that shares for main indicators (e.g. innovations) are fairly similar while there are more significant differences in measures of how organisations innovate. Though some respondents found the questionnaire difficult to answer, there is no clear 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, depending on the purposes of the survey it can in some cases be relevant to target specific groups of institutions, such as hospitals or schools.

## 6. Conclusion and directions for future research

The work accomplished in the MEPIN pilot study provides a number of insights on how we understand innovation in the public sector, how it can be measured, and also on what still needs to be done. The study has demonstrated that it is possible to collect comparable data on the public sector in the Nordic countries. The results tended to be relatively coherent across the countries in the survey which signals that the questionnaire seems to work. Conceptually we are also starting to get a more nuanced understanding

**Table 3**

Results from the MEPIN pilot study – Innovation drivers, strategies and barriers, 2008–2009 (in percent).

	Denmark		Finland		Iceland		Norway		Sweden	
	Central govt.	Other								
<b>Innovation strategy and organisation</b>										
Specific goals for innovation	37.5	22.0	N/A	N/A	55.6	71.4	45.8	34.7	43.6	25.0
Innov. part of overall strategy	31.8	31.0	N/A	N/A	33.3	64.3	33.3	21.7	29.1	24.1
Development department	21.6	28.6	N/A	N/A	61.1	32.1	15.6	10.5	20.0	25.0
Innov. organised as projects	55.7	48.2	N/A	N/A	50.0	46.4	51.0	44.8	38.2	37.1
Managers give high priority to developing new ideas	55.7	57.7	N/A	N/A	44.4	75.0	50.0	44.1	63.0	46.6
Top mgmt. active leader of innovation implementation	55.7	47.0	N/A	N/A	22.2	64.3	54.2	42.7	48.1	39.7
Staff time devoted to innovation projects	46.6	37.5	N/A	N/A	61.1	67.9	46.9	30.1	25.9	13.8
<b>Innovation drivers</b>										
Internal-management	80.7	84.5	N/A	N/A	78.9	80.8	77.6	75.6	91.5	88.8
Internal-staff	72.7	75.0	N/A	N/A	72.7	65.6	49.4	53.5	83.0	71.4
Political driving forces	54.5	61.9	N/A	N/A	57.9	57.7	57.6	52.8	66.0	65.3
Public organisations	19.3	14.9	N/A	N/A	73.7	92.3	21.2	14.2	25.5	27.6
Businesses (suppliers, users)	33.0	25.0	N/A	N/A	36.8	34.6	25.9	24.4	42.6	26.5
Citizens	33.0	32.1	N/A	N/A	31.6	53.8	29.4	38.6	48.9	53.1
<b>Barriers to innovation</b>										
Lack of flexibility in laws	15.9	28.0	23.8	7.8	52.6	51.7	7.3	9.4	31.5	20.9
Lack of incentives	10.2	12.5	12.8	20.5	26.3	75.9	6.3	13.7	14.8	23.5
Lack of funding	43.2	50.6	51.2	32.0	21.1	31.0	20.8	35.3	48.1	45.2
Risk of failure	9.1	7.7	2.4	4.1	52.6	62.1	10.4	4.3	5.6	9.6
Lack of cooperation in organisation	11.4	14.9	N/A	N/A	52.6	69.0	7.3	3.6	14.8	19.1
Internal barriers (time or incentives)	29.5	43.5	N/A	N/A	72.2	86.2	20.8	36.2	55.6	58.3
External barriers (rules, suppliers, resistant users)	23.9	22.0	N/A	N/A	36.8	69.0	7.3	13.8	16.7	18.3

Source: MEPIN pilot study (Bugge et al., 2011). Results provided by Statistics Denmark, Statistics Finland, RANNIS, Statistics Norway and Statistics Sweden. Note: Results based on a pilot study with the purpose of testing and learning from the collection of innovation data in the public sector. The data should not be considered as official statistics, nor should it be considered suitable for benchmarking. Results based only on responses, and are not grossed up to the full population.

N/A, not available.

Innovation strategy – share of all organisations that agree or strongly agree with the listed statement. Innovation drivers – share of organisations with innovation activities that have listed the driver as highly important. Political drivers are composite of 3 political drivers (budget changes, new laws or regulations, new policy priorities). Barriers to innovation – share of all organisations that have listed the barrier as highly important.

of the relationship between innovation in the public and private sector.

This paper has framed the discussion of an overall measurement approach for public sector innovation in terms of its relation to measurement of innovation in the private sector. There are a number of aspects that argue against an assimilation approach using the same framework for measuring innovation in the public and the private sector. In addition to objectives at the organisational level such as increasing efficiency and improving quality, the public sector also has objectives at a societal level and innovations that address these at a systemic level. The paper has argued that there is a need to reflect these specificities of the public sector in the measurement framework and indicators targeting public sector innovation. These differences suggest a demarcation approach in terms of the context for the innovations, which can be addressed through indicators and questions on innovation typology, incentives, objectives, procurement, drivers and barriers and finally diffusion of innovation.

But while there are important differences between public and private sector, the results have shown that there are also many commonalities in terms of the concept of innovation and innovation processes. Many characteristics of innovation patterns and practices in service production are similar to that for businesses, and many intermediate

objectives and measures at the level of public organisations are shared by both sectors.

In this way the paper has sought to discuss the relevance of both an assimilation and a demarcation approach and thereby to draw a more nuanced picture of what innovation in the public sector is and how it can be measured. However, the results have also illustrated how innovation in the public sector tends to be closely intertwined and dependent on interaction with the private sector and with users of public sector services. In this sense, due to the systemic nature of innovation in the public sector, and in order to fully understand how innovation in the public sector relates to its systemic counterparts, one may argue that an integrative approach is the most appropriate to capture public sector innovation. This would both maintain a common perception of innovation across sectors, and at the same time allow for further development that takes the specificities of the public sector better into account.

Although progress has been made in the MEPIN study there are still great potentials for future research to further improve the development of a framework for measuring public innovation.

Some avenues for future research include looking more critically into typologies of innovation in the public sector, i.e. different types of public sector innovations. The MEPIN questionnaire is currently very close to CIS and there is

perhaps a need to make further adjustments that reflect the nature of the public sector more carefully, to examine whether additional types are needed or whether other options can be identified through the use of supplementary questions. Of particular interest here is the possible need for a notion of systemic innovation across broad constellations of actors addressing societal objectives beyond the individual public organisation. The results here suggest an important role of politically mandated, or top-down, innovations, but also indicate the importance of internal factors. Indeed, politically mandated innovations represent a difficult issue. Definitions of innovation for businesses focus on change and implementation, where it is taken as given that changes are the result of decisions made by the business itself with the aim of improving its operations. For the public sector, changes may be politically mandated and potentially reversed within a short period. Our view is that it is important to include politically mandated changes, but it may at the same time also be important to be able to identify whether innovations in the public sector are based on internal decisions or whether they are politically mandated. One possible solution to this is to include policy innovations into the typology of innovations in order to better grasp the uniqueness of the public sector. This would also better reflect different types of public sector activities, consisting of policy formulation, administration and service provision.

Another issue that needs elaboration is the high share of innovative organisations, and as we have seen there may be various explanations to this. The high innovation rates suggest a need for modifications of the innovation definitions and questions. One way to do this would be to distinguish more clearly between incremental and novel innovations. While this distinction is needed, it is still important to acknowledge and understand how the accumulative “bricolage” (Fuglsang, 2010; Fuglsang and Sørensen, 2011) taking place in day-to-day practice and problem-solving relates to more systemic innovations.

Yet another issue that needs refinement is defining the statistical units and delimiting the population among public sector organisations, which has proven to be very complex in a public sector context. This implies, e.g. dealing with the problem of heterogeneous respondents in terms of size, and sorting out what are the right levels and who are the right respondents in various kinds of public organisations.

Related to the integrative approach that we suggest is rethinking how the user is incorporated in the measurement of innovation. Building on the CIS questionnaire the MEPIN project has taken a clear upstream focus on innovation in service provision focusing on the innovator rather than the citizens and their user experiences. As the objectives of public services primarily are related to the citizens' use and experience of these, it could be argued that there should be a stronger focus on including the citizens' perceptions of the public innovations in question. There is thus arguably a challenge to bridge upstream service provision and downstream user experience in terms of measurement.

Associated with bridging the measurement of innovation in public service provision and the users' experience

with these services, one could discuss whether using a survey is the best way to collect data on public sector innovation. Technological advances in user interfaces as well as increasing openness in terms of data sharing and accessibility poses the question whether data collection could also be based on already accessible data sources and existing public registers online. An additional option is to incorporate questions on innovation in the public sector in existing public reporting which is already taking place extensively and annually.

Finally, we have argued above for a systemic perspective on innovation across public, civic and private realms. As an alternative to studying how separate sectors and societal spheres could be measured one could imagine alternative and integrative approaches that seek to combine measures for more than one sector, for example the public and private sector, and potentially also citizens as a third equal part of our modelling and understanding of systems of innovation and the evolution of modern economies and societies. One possible way to do this would be to approach innovative, creative and problem-solving activities in society from an individual level in addition to an organisational level (Lorenz and Lundvall, 2011; Eurofound, 2012).

#### Appendix A. Definitions of innovation in the public sector

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.

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