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The state of play for measuring innovation in the public sector

A starting point to accelerate learning and implement change

Background note prepared for the OPSI National Contact Point meeting on public sector innovation measurement on September 21, 2022 at the OECD

Information Note: This draft report is prepared as background to the special session of OPSI's Network of the National Contact Points (NCPs) to take place on 21 September 2022 at the OECD Headquarters. This session is aimed at commencing discussions to support the work on the topic of public sector innovation (PSI) measurement. The report overviews and evaluates PSI measurement approaches to inform the discussion on possible common approaches to measurement going forward. The objective of the research is three-fold: first to identify existing measurement activities on PSI and gaps in the latter; second to explore alternative approaches to measure PSI, which respond to different use cases; and third, to pave the way to identify a way forward to operationalise a measurement framework on public sector innovation. Each section of the report ends with discussion questions for the NCPs. The report is based on desk research and consultation of NCPs conducted over the summer of 2022. This report was written by Nordine Es-Sadhi, Andrew Morgan, Misha Kaur and Piret Tonurist.

Marco Daglio marco.daglio@oecd.org
Piret Tõnurist piret.tonurist@oecd.org
Misha Kaur misha.kaur@oecd.org

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Introduction

This report is prepared as background to the special session of OPSI's Network of the National Contact Points (NCPs) to take place on 21 September 2022 at the OECD Headquarters. This session is aimed at commencing discussions to support the work on the topic of public sector innovation measurement. At this stage, the report is intended to be broad, and cover various facets of public sector innovation measurement, including innovations, innovation drivers and types, innovation process, impact of innovations, and capacity for public sectors to innovate.

The purpose of this work is to:

- Create a stock take of current activities related to public sector innovation (PSI) measurement, including:
    - The purpose or reasons for undertaking the activity
    - The level the activity is examining
    - What works well, what is not working well, where are there gaps in tools or frameworks
- Identify opportunities the OECD could support for improving existing, or creating new frameworks, or in adapting tools for supporting public sector measurement activities at a country level (this could cover different purposes or levels of examination)
- Identify 3-5 elements or indicators that would be most useful for cross-country comparability on public sector innovation (this could cover different purposes or levels of examination)

In line with the overall goals above, the aim of this report is to provide a synthetic overview and evaluate existing approaches and research on the measurement of PSI to inform the discussion on possible common approaches to PSI measurement going forward. The objective of this research is three-fold: first to identify existing measurement activities on PSI and gaps in the latter; second to explore alternative approaches to measure PSI, which respond to different use cases; and third to pave the way to identify a way forward to operationalise a measurement framework on public sector innovation.

The report first presents in Section 1 the case for public sector innovation measurement drawing a distinction between measurement efforts in the private sector. Section 2 presents a review of measurement activities of PSI at the national and international level stemming from public sector organisations as well as universities and other research organisations. The section also discusses different methodologies to measurement (surveys, big data etc.). Section 3 outlines the objectives and use of current measurement activities. Section 4 discusses the remaining research gaps and Section 5 illustrates four measurement models that demonstrate different approaches, which can be used in different contexts. The paper ends with reflections on next steps for the PSI measurement agenda.

This report is based on a consultation of the NCPs (written and oral) that has taken place during July and August of 2022 as well as a literature review and desk-research. The study teams would like to thank the participants of the interviews and NCPs that have provided written answers, their contribution is greatly valued.

The report has been drafted by Nordine Es-Sadki (UNU-MERIT) with input from Andrew Morgan (Australian National University) under the coordination of Piret Tõnurist and Misha Kaur in the Observatory of Public Sector Innovation.

1. The case for measurement

In 2021, government production[1] as a share of GDP was 23.9% on average amongst OECD countries. Given the significance of this, there is an interest in how resources are used, the quality of public services and how societal and economic challenges are being addressed. There is growing awareness that encouraging innovation in the public sector is key to improve services (Torfing and Ansell, 2017; Arundel et al., 2019). Consequently, there has been a great deal of discussion in management literature by academics and practitioners in recent years as to the impacts of innovation and in demonstrating the value of innovation, because of the extensive adoption of innovation in the public sector. The need for measures of public sector innovation has been stressed by the OECD and in many other organisations such as the EU (OECD, 2022). This interest has led to (government) support to measure public sector innovation.

For private sector innovation, guidelines for how to use surveys to measure innovative activities have been available via the OECD's Frascati Manual for R&D since the early 1960s and via the Oslo Manual for other innovation activities since 1992. The Oslo Manual 2018 includes a short section on PSI (paragraph 2.6.1 on "Innovation in the General government sector"); however, thorough guidance from the OECD is currently missing for public sector innovation. PSI, however, is often service-centred and has specific drivers (public value, political cycles etc.) that are difficult to quantify, contextual and difficult to capture in measurement (OPSI, 2018).

One of the main objectives of measuring public sector innovation is to inform policies on how to improve public sector outcomes such as the quality of public services, their impact and responsiveness. Key in this regard is to determine if there is heterogeneity in how public sector organisations innovate (Arundel et al., 2015), e.g. whether different approaches and capabilities lead to similar or different results/outcomes. Measuring public sector innovation can identify which approaches to innovation produce which outcomes, for example, types of innovations (improvements in service quality or process efficiencies or fundamentally new services). In addition, measurement efforts can point to the capabilities needed for different types of innovation in the public sector. By conducting such analysis public sector organisations can learn from each other and improve their performance. Furthermore, these barriers to innovation – be it on the individual, team, organisation or system level – can be mitigated or removed.

The research in this study shows that many measurement activities have been conducted in various countries and for different purposes. Denmark and the Nordic countries following the MEPIN survey (Bugge et al., 2011) and the InnoBarometer (COI, 2022) which focus on measuring the incidence of public sector innovation and its drivers and barriers. These activities have inspired a lot of successive surveys in different countries across the world. Other examples presented in this paper illustrate measurement initiatives conducted to evaluate the success of innovative programs and to increase innovative capacity. Another important goal of measurement activities for many participating countries is, through surveys, raise awareness on public sector innovation by showcasing, through its questioning, what public sector organisations can do with innovative approaches and solutions.

The research shows a variety of uses of measurement efforts, ranging from understanding the incidence of innovative activities, barriers or enablers to innovation at the organisation level, and identifying the impacts of innovation programs. The results from the measurement studies conducted at national level

[1] OECD (2022), Government production costs (indicator). doi: 10.1787/44ec61e6-en (Accessed on 29 August 2022). Government production costs include: compensation costs of general government employees; goods and services used and financed by general government (including intermediate consumption and social transfer in kind via market producers paid for by government)

have mostly been used in academic research and disseminated with national authorities and other stakeholders. The consultation with NCPs has shown that in some cases results from measuring innovative efforts have translated into new policy directives or contributed to decisions on policies and services. In other cases, results have been discussed with participants of the measurement activities in various forms with the aim of discussing their strengths and weaknesses and identifying areas for improvement. The consultation has shown, however, that more can be done using existing data but also exploring other possibilities. Furthermore, even with the widely applied Innovation Barometer efforts, international comparability is still questionable, as countries have made changes to questions, target participants and guidance to survey respondents. Next to increasing the use of PSI measurement activities the consultation also discussed the gaps identified in the current measurement activities as in what is still unanswered when looking at the current measurement exercises. The research has shown a need to continue with benchmarking public sector innovation performance, but also to explore other possibilities.

One of the topics mentioned by several NCPs was innovation management. The Oslo Manual defines innovation management as including all systematic activities to plan, govern and control internal and external resources for innovation (OECD, 2018). The consultations have shown that several of the NCPs, particularly as part of monitoring and evaluating innovation projects, consider this broad perspective. Another topic identified is measurement of the capacities for government to use innovation meaningfully. Current efforts typically focus on capacities on the individual or organisational level. However, broader efforts to understand the capacity of organisations or the public sector system's capacity to use innovation meaningfully is not yet observed. The OECD's Innovative Capacity Framework (OECD, 2021) and accompanying tools offer one avenue for considering measurement in this area. Another possibility as suggested in the consultation is to analyse the role of individuals within an organisational unit. Understanding and managing the impact of individuals in their roles as employees on innovation is a policy priority (OECD, 2018; 2022). Measurement at the individual level could provide policy-relevant data on a range of topics such as the effect of innovation on skills obsolescence, willingness of individuals to innovate and factors that support and empower individuals to innovate in their role as employees of a public sector organisational unit. A further emerging topic in measurement is monitoring the composition of public sector innovation portfolios (different types of innovation) and support measures needed for the former (OECD, forthcoming).

To be measured, innovation activities and concepts must be defined (Gault, 2018). Definitions are required for innovation and innovative capacity in the public sector. It is important to define concepts as these are relevant for measurement and improve harmonisation. The definitions of concepts relevant for this report are provide in Annex A.

1.1 The possible applications of public sector measurement

Public sector measurement can be used in different ways, for example to understand, communicate or inform decisions around:

- the drivers of innovation,
- policymaking or services,
- strengthen the capacity of an individual/organisation/system to use innovation to achieve goals,
- the impact of innovation,
- the incidence and type of innovation efforts,
- demonstrating the value of investments,
- process effectiveness or efficiency,
- theoretical development.

Public sector measurement can also be used to target different levels or systems:

- individuals
- organisations or groups of organisations
- the public sector system
- a specific policy domain, policymaking system etc

Finally, measuring innovative capacity also allows international benchmarking and comparison, and gives a platform for learning through sharing of leading practices.

2. Measurement activities on PSI

- *Traditionally surveys have been the main source of information on public sector innovation*
- *More recently object-based[2] approaches are being used in subject-based surveys to reply to increasing demand to use surveys for analysis of phenomena*
- *Case-studies and interviews are used to gain in-depth understanding of causal relationships*

Evidence-informed policymaking requires accurate indicators of public sector innovation to track policy improvements against specific innovative activity and build innovative capacity in the public sector. Several efforts have been made to track progress on public sector innovations using very different approaches at different measurement levels, i.e. individual, organisational, systemic. Such efforts have been summarised below against the types of measurement tools that have been utilised.

2.1 Surveys

Traditionally surveys have been the main source of data on public sector innovation. The first large-scale survey of innovation in the public sector was the 2008-2009 MEPIN survey of public sector organisations in Scandinavia. This survey followed to a large extent the Oslo Manual's (third edition) definitions of innovation (Bugge et al, 2011). Other surveys followed as well as reviews of the literature (see Arundel et al. (2019) or Kattel et al. (2018) for an overview).

The Innovation Barometer

The Danish Center for Offentlig Innovation conducted a representative survey of innovation in 2015 in collaboration with the official national statistical organisation and obtained responses from 1,255 municipal, regional, and state workplaces (COI, 2016). With this Denmark, published the world's first official statistics on public sector innovation by a national organisation. The survey was targeted to several public sector organisations such as kindergartens, nursing homes, hospitals, and educational institutions. Other Nordic countries followed such as Norway in 2017.

To date Austria, Czech Republic, Germany, Norway, Sweden, Iceland, Finland and the Netherlands, have all conducted one or more national surveys, utilising similar methodologies and definitions, though adapted somewhat to better serve national agendas. The Nordic countries collaborated in creating the Copenhagen Manual (COI, 2021) which offers guidance to practitioners interested in conducting a public sector innovation survey in line with the Innovation Barometer approach.

[2] Object-based studies focus on a phenomena of interest. For instance collecting data on specific innovations identified in journals or reported by an organization. Subject-based studies focus on the organisation or the actors responsible for the innovations.

Surveys for analysis

Several countries have conducted surveys or other measurement activities with different purposes as in the traditional sense of benchmarking and producing indicators. The aim of these kind of measurement activities are to focus on the needs of public sector organisations and their managers. The results obtained from these measurement activities are aimed to support public authorities and provide insights in defining their innovation strategies.

One of such measurement activities was the experimental project entitled 'Innovation Panel for the Public Sector[3]'conducted by a team from the Portuguese Administrative Modernization Agency. This project aimed to develop an instrument for monitoring and adapting innovation strategies. This instrument is to be used by Portuguese public sector manages as an evidence-based decision-making navigation panel. One of its main usages are consolidated organisational level reports on innovation practices for each of the participants and an innovation dashboard to help identify strategic options.

Other examples of using surveys for analysis are activities conducted in Canada as part evaluating the Innovation Challenge Program[4]. With a survey of participants, a social network analysis and a feasibility study, the study team answered research questions such as to what extent the program was effective in addressing the challenges and to what extent have the challenges been able to increase awareness. Specific examples, including indicators used will be provided in the next iteration of this paper, following input from countries.

Similar measurement activities were conducted in Colombia, Chile and Finland (see Annex B). In Columbia a capacity index is build based on 4 pillars innovation, talent, knowledge management and collaboration. The capacity index develops recommendations for each participant in the survey. The aim of the capacity index is, together with foresight analysis, to support public sector managers in making better informed decisions. Similarly in Finland through an innovation action research project[5] the research team has developed practical resources for public service actors to re-define processes and conducted real-life pilots to co-create public services with different stakeholders.

The OECD has also started working with countries on measuring their innovative capacity (see Annex A OECD's Innovative Capacity Framework) through a mix of measurement activities and tools, including the use of semi-structured questionnaires. The questionnaires prompt reflection on factors at the individual, organisational and systemic level factors that may help or hinder a public sector's ability to use innovative approaches or produce innovative solutions to achieve better outcomes. The first utilisation was undertaken in the context of the Romania government, with the report expected to be published in late 2022 (OECD, forthcoming). A refined and adapted set of questionnaires will be applied to the Latvian context in 2022-2023.

2.2 The use of the object-based method in surveys

- *The object-based method is useful to collect information on enablers(drivers) features and outcomes of public sector innovations*

[3] Report: https://www.ama.gov.pt/documents/24077/228618/ama_micro_relatorioInovX_EN_20201007.pdf/86bb9892-9dc7-41c4-a44a-5ae403536deb

[4] Challenges are open innovation approaches that are designed to provide incentives to encourage a broad set of innovators to tackle a problem, where solutions are not always apparent. For more information see Canada Innovative Solutions: https://www.ic.gc.ca/eic/site/101.nsf/eng/00001.html

[5] Co-creation of Service Innovation in Europe | CoSIE https://cosie.turkuamk.fi/

- *For PSI it is recommended to combine a subject-based method with an object-based method in survey questionnaires*

The Innovation Barometer (IB) as well as the survey used in the Portuguese Innovation Panel for Public Sector, use an object-based method approach by asking respondents to focus on the most recent innovation in the IB and on the most important/impactful innovation in the Portuguese example. The object-based method collects data on a single, focal innovation (i.e. the object of the study). The main purpose of the object approach is not to produce aggregate innovation statistics, but to collect data for analytical and research purposes by facilitating information retrieval about enablers, features and outcomes of innovations (OECD, 2018).

The IB as well as the Portuguese survey do not only use the object-based method but incorporate it within a subject-based innovation survey. The approach includes using a questionnaire covering all the organisations' innovation activities as well as a module on a single innovation. The advantage of this approach is that it can obtain information on a focal innovation for a representative sample of all innovative public sector organisations. Other methods will be prone to self-selection biases (OECD, 2018) for instance through expert evaluations or innovation announcements by public sector organisations. A second major advantage is the possibility to collect data on all types of innovations. Using experts or announcements to identify innovations will produce a bias towards successful product innovations. Moreover, the object-based method can collect information on innovations that are new to the organisation only or not sufficiently novel to be reported online or in public administration journals.

From the Oslo Manual (OECD, 2018) we learn that the inclusion of an object-based method module in an innovation survey can support the use of in-depth, quantitative, and Likert-scale questions that are too difficult for respondents to answer for all their innovations combined. For instance, questions that require respondents to calculate the average importance of user involvement across multiple innovations or innovation activities. In some innovation activities user involvement may have been important while in other innovation activities it may have not. Potentially difficult questions to answer at the organisational level (subject-based) include expenditures on different innovation activities and the use of specific technical capabilities. With an object-based approach the respondent can answer these types of questions for one single innovation which has shown in practice to be easier for the respondent.

The use of questions on a single focal innovation ensures that the set of data collected refer to the same innovation. This is primarily an advantage for analyses on the relationships between innovation inputs, activities and outcomes, as in the research by Arora, Cohen and Walsh (2016) on the economic value of alternative knowledge sources for innovation. It can also assist other types of research particularly relevant for the public sector such as research into blended innovations that span both services and processes (Bloch and Bugge, 2016).

A good balance has to be found as the Oslo Manual recommends to not only include object-based questions in an innovation survey. Several research and policy questions cannot be addressed through questions on a single focal innovation. Some of which are relevant to the OPSI framework on innovation capacity (discussed in section 4 of this report). For instance, questions on the organisation internal capabilities and strategies as well as the external environment and questions that are used to create aggregate statistics such as resources spent on innovation activities in the public sector. The object-based method is therefore not that useful for constructing statistics often used as headline indicators at the national level as the answers do not fully reflect all of the innovation activities of the underlying organisations.

Of interest is to note that the Innovation Barometer asks respondents to focus on the *most recent* innovation whereas the Oslo Manual recommends to use the *most important* innovation with respect to its actual or expected contributions. The latter approach is adopted in the Portuguese setting. Both methods use the same reference period but the most important innovation has some clear advantages as explained in the Oslo Manual (OECD, 2018). First, the most important innovation is well understood by respondents and is

memorable. Moreover, the most important innovation is relevant for research such as examining the factors that lead to success. The most recent innovation is useful in cases where you want to make sure that a random sample of types of innovations are being collected although this can also be covered with the most important innovation by allowing all types of innovation (services, processes, or a combination) to be answered by the respondent.

For users of the data it is likely of more interest to collect information for innovations with the largest expected or realized benefits. In this case, it could be important innovation object method within a subject-based survey. Next to aggregate headline indicators, stemming from the subject-based part of the questionnaire the results of the most important innovation module can also be used to construct aggregate indicators such as the types of innovation that public sector organisations find of greatest benefit to the organisation. However, the best survey approach of course depends on the identified research question.

2.3 Case studies and interviews

The most important benefits of using interviews and case studies is that they can provide in-depth understanding of causal relationships, something which is often not possible in cross-sectional surveys. They can be used as a complementary addition to surveys, and provide further depth and probing of certain areas. Topics that have been researched include the effect of different strategies on the types of innovations that are developed (Arundel et al., 2019). The disadvantage of case studies and interviews is that they often are unrepresentative of all public sector organisations. To the contrary, statistically representative surveys can provide a country-wide overview of public sector innovation activities, possibly broken down by organisation (municipalities, agencies, national ministries etc.). In several of the reports published together with national survey results using surveys, case-studies have been included to help explain how innovation happens and show-case good practices, several examples are for instance included in the Nordic Innovation Barometer report of 2019 (Lykkebo et al., 2019).

Annex B provides an overview of the different measurement activities conducted by OECD member as collected in the recent consultation with NCPs.

2.4 Big Data

- *New measurement approached using Big Data can address some of the shortcomings of traditional tools*
- *Its main advantages include timeliness, the ability to collect information on specific topics and produce statistics at a highly disaggregated level*

Some shortcomings of innovation surveys include costliness and that it takes a significant amount of time (Kinne and Lenz, 2021), resulting in a substantial time lag between the reference year of the data and the time the data is published. Another critique is that innovation surveys usually apply a subject-based approach (i.e., measuring innovation at the level of the organisation and not for individual innovations) and provide little information on specific innovations or innovation related to certain newly emerging technologies or market trends.

Big data sources have the potential to overcome some of these shortcomings of innovation surveys and may offer a more complete picture of innovation (Kinne and Axenbeck 2018, 2020). Key sources of big data that can be used for measuring innovation at the firm level include firm websites and social media activities of firms, but also other digital sources such as proprietary data sources, media reports, job offerings or online platforms. While none of these sources is devoted to report on innovation, they may contain

information that is related to activities of and events in organisations that are linked to innovation (see Arora et al. 2016). Developing big data analytics promises to identify and extract this information.

Webscraping is one of such Big Data approaches to collect indicators and is based on data available on the internet. Theoretically it provides a cheaper and timelier source of innovation data in comparison to surveys (Arundel and Es-Sadki, 2019). Other advantages include the ability to collect information on specific key-words used by public sector organisations and to produce statistics at a highly disaggregated level, e.g. at the departmental unit level of a municipality.

A small number of studies have used web-scraping to develop innovation indicators, but most are of the business sector. Many of these experiments have either produced inaccurate results in comparison with other verified sources of data, or they have only tried to produce basic innovation indicators of low value, such as the percentage of firms that report an innovation over a defined time period (Arundel and Es-Sadki, 2019).

The Eurostat STARPIN project (Bianchi et.al. 2019) combines administrative data with web-scraping to measure two types of public sector innovation: the use of four methods of waste collection and three home healthcare services. The project essentially measures technology adoption, which may or may not be an innovation for the targeted agencies. The project integrates statistical data, data collected through web scraping, and administrative data, for a pre-defined set of services. Services are associated to specific characteristics that can be ordered according to a hierarchical "ladder" in terms of innovativeness. Institutions involved in their provision can thus be classified as more or less innovative by observing their level in a "ladder" of innovation capacity. According to the authors, the method can be applied to any category of public services. The main result of the research consists of the definition of the phases of the process for collecting data on public service innovation based on web-scraping. Based on the "validation phase and cross-sectional data analysis" the innovativeness level score is obtained and verified against relevant administrative and statistical data. Bianchi et al. (2019) conclude that the richness of micro-level data can be exploited to evaluate patterns of innovation, their determinants, and effects on (public) value creation.

Questions for discussion:

- **Are there any other measurement activities or tools that have been overlooked?**
- **What information are you currently lacking regarding innovation outcomes, processes, drivers, or capacity that could be collected through measurement activities?**
- **What kind of measurement activities would you like to conduct in your respective countries? What kind of support would you need to start?**
- **Subject-based questions are good for producing indicators and object-based questions are useful to analyse phenomena's.**
    - **What information – collected through subject- or object-based modules – is most important to you and the public sector organisations you work with?**
    - **What are your thoughts on the recommendation to combine an object-based module within a subject-based questionnaire as is done in the IB, Portuguese and recommended by the Oslo Manual for private sector innovation?**
    - **Could this be a common approach to move forward?**
- **What are your thoughts on using Big Data for PSI? What possibilities are there to develop and explore this topic further in your respective countries?**

3. Objectives and use of current measurement activities

- *Survey's objectives include benchmarking, increasing engagement, identifying drivers and barriers. Results have been used in interactions with stakeholders, policy making and (self) evaluation*
- *Structured questionnaire survey's objective is similar as structured survey, but give more room for flexibility to ask follow-up questions*
- *Use of Big Data to produce indicators will increase given its timeliness advantages, but innovation is highly heterogeneous and difficult to identify using web-scraping methods*
- *Case-studies and interviews are useful to gain in-depth knowledge on why a particular PSI was successful. They have been used to provide additional insights on top of traditional indicators*

Several measurement efforts have been discussed above. These research methods can be categorised in 4 measurement methods:

1. Structured questionnaire survey
2. Semi-structured questionnaire survey
3. Big data approaches
4. Case studies and interviews

This section discusses the objectives and usage of the data resulting from these methods. This section draws on consultations with relevant stakeholders in July and August of 2022 as well as desk-research and a literature review. Annex A provides a summary table of the consultations conducted as part of this research.

3.1 Structured questionnaire survey

Most of the stakeholders consulted have used a structured questionnaire survey, of which a large majority follows more or less the Innovation Barometer framework. The surveys have been targeted at the organisational level with, depending on the country, different organisations as part of the survey sample such as national agencies, ministries, and municipalities. Common objectives mentioned by several stakeholders include:

1. Benchmarking innovation performance and activities
2. Promote and increase engagement on public sector innovation
3. Identifying barriers and drivers of public sector innovation
4. Identifying what kind of innovation is being conducted in the public sector

Usage of the results of these structured questionnaire surveys is more diverse across countries, but most of them use the results in discussions with national authorities on the topic of public sector innovation and in some instances it directly feeds into policy making. Other usages include dissemination of the results and academic research. In Sweden the results have been used to develop a self-evaluation tool for participants of the survey[6].

[6]Sveriges Kommuner och Regioner. https://innovationstestet.se/

3.2 Semi-structured questionnaire survey

Semi-structured questionnaire surveys have mostly been used by research for (first) insights on the topic of public sector innovation by Borins (2000, 2001). This method is costly but has some advantages over a structured questionnaire survey as it takes a flexible approach by combining pre-determined research questions while leaving room for probing for more details. It often works with open-ended questions which on a large scale are difficult to manage but are nevertheless useful when one wants to gain in-depth knowledge on a particular topic.

3.3 Big data approaches

One of the main advantages of big data approaches is that results can be obtained at lower costs compared to surveys and case studies and results are more timely. The drawback is that these kind of approaches offer little in-depth knowledge on how and why public sector organisations innovate. It can produce headline indicators such as the number of innovative public sector organisations. There are leading examples of this approach for private sector innovation particularly those that corroborate results with official innovation statistics e.g. (Kinne and Lenz (2019, 2021) and Daas and van der Doef (2020, 2021)[7]. There are opportunities to explore these approaches with public sector innovation measurement using these big data approaches as there are few studies conducted so far in the public sector.

3.4 Case studies and interviews

The objective of this approach is often gaining in-depth understanding of causal relationships, something which is often not possible in surveys. Some of the examples provided in the consultations can to some extent be categorised as part of this measurement method. One example is that of a social network analysis of stakeholders involved in the challenges programme in Canada. Challenges are open innovation approaches that are designed to provide incentives to encourage a broad set of innovators to tackle a problem, where solutions are not always apparent. The objective of the social network analysis was to see to what extent these challenges have increased or enhanced public awareness of an issue based on social media mentions. The results of this analysis have been used to understand the outcomes of the challenge and to plan future challenges more effectively.

Another example is an innovation action as part of a large research project in Finland (COSIE). The objective of that action was to develop practical resources for public service actors to re-define operational processes. The action employed real-life pilots to co-create a set of relational public services with various combinations of public sector, civil society, and commercial actors. The results of this action have been disseminated in papers and used in discussions with national authorities.

Questions for discussion:

[7] These studies use a sample of firms that participated in the CIS and for which data on the innovation status is available. This data is used as training data. For all firms in the CIS sample, information from the firms' websites is extracted and transferred into a text data base. Then a model is developed that uses this text database to predict the known innovation status of the firm. The model is designed such that its results show a very high fit with the innovation status of the firms. This model is then applied on the text of websites of firms which did not participate in the CIS to predict the innovation status of these non-CIS firms. This approach is useful as it allows to derive innovation indicators for sectors and size classes not covered by the CIS or from non-respondents to the CIS (Rammer and Es-Sadki, 2022).

- **Measurement activities have different objectives and usages, in your opinion what are the needs of public sector managers, and which measurement activities would be suitable for that?**
- **Similarly what kind of measurement activities are needed for system level trends and policy making?**
- **What other types of decisions or usages could information on innovation capacity, efforts or outcomes contribute to?**

4. Different models to measure PSI

Table 1. Overview of the different models to measure PSI and methodological issues

Criteria/Models	Structured questionnaire survey	Semi-structured questionnaire survey	Big data approaches	Case studies and interviews
Level	Organisation, individual, system	Organisation, individual, system	Organisation	Organisation, individual,
Objectives	Benchmarking innovation performance and activities Promote and increase engagement on public sector innovation Identifying barriers and drivers of public sector innovation Identifying what kind of innovation is being conducted in the public sector	More in-depth insights Benchmarking innovation performance and activities Promote and increase engagement on public sector innovation Identifying barriers and drivers of public sector innovation Identifying what kind of innovation is being conducted in the public sector	Measuring the number of public sector innovation withing a sample	In-depth knowledge on innovation How do innovation drivers lead to a selection of innovation activities How do organisations learn to innovate How do they build innovation capacity
Usage	Discussions with national authorities Feeds into policy making Monitoring aspects of public sector innovation (Capacity of individuals, organisations or systems to innovate meaningfully, identifying the drivers for innovation, innovation process effectiveness or efficiency, types of innovations)	More in depth discussions with authorities Feeds into policy making Monitoring aspects of public sector innovation (Capacity of individuals, organisations or systems to innovate meaningfully, identifying the drivers for innovation, innovation process effectiveness or efficiency, types of innovations)	Timely information on the incidence of public sector innovation activities or outputs	In-depth knowledge on a particular topic Impact of innovations Theory development Innovation process effectiveness or efficiency Demonstrating the value of investments Identifying the drivers for innovation
Level of focus	Individual, organisation, system	Organisation, individual, system	Organisation	Individual, organisation, system
Advantages	Generalised to target population Data to analyse relationship between factors and outcomes	In-depth insights Probe for more details	More timely and frequent Lower costs Census-like data (depending on source) Open data (accessibility) Flexibility	In-depth insights Theory development

Disadvantages	No insights from respondents Difficult to establish causality	High costs Small scale	Biased information (self-reporting + focus on product innovation) Limited coverage and depth Lack of accuracy and consistency (definitions)	Not generalisable to population No comparison group
Operational costs (material, travel, telephone)	Moderate if online High if postal	High	Low	High
Innovative Capacity framework	Purpose, Potential and Capacity	Purpose, Potential, Capacity and Impact	Purpose	Purpose, Potential, Capacity and Impact
Micro-Data Linkage (administrative data)	Yes	Yes, but with barriers	Yes	Yes, but with barriers
Examples	Innobarometer (European Commission) 2011 Innovation Barometer (DK, NO, FI, SE, NL,DE, AT) 2015 to date) MEPIN (2011) Surveys for analysis (PT, CA, FI)	Borins (2000, 2001) 19901998 Semi-finalists to Innovation Awards	Eurostat STARPIN (Bianchi et. al. 2019) Private sector leading examples: Kinne and Lenz (2021) and Daas and van der Doef (2020, 2021)	Bason (2018) Bartlett and Dibben (2002) Fuglsang (2010) Several case studies are reported in the summary report of the Nordic IB report (2019), link Case studies in New-Zealand

Note: This table draws on consultations with National Contact Points (OECD stakeholders) see Annex A, Arundel (forthcoming) (Handbook on how to conduct a survey)and Rammer and Es-Sadki (2022) and authors own expertise.
Source: OECD.

5. Remaining research gaps

- *How innovation is managed within organisations is of interest to several stakeholders*
- *How different factors at the individual, organisational and systemic level can help or hinder innovations to produce meaningful outcomes*
- *How learning at the organisation and employee level happens and how capacities for innovation can be improved is of importance to understand how and why innovation happens*
- *How different individual, organisational and systemic factors contribute to the emergence of different types of innovations and composition of innovation portfolios is unclear*
- *Benchmarking and international comparability is one of the main objectives of traditional survey, harmonisation or practices is necessary to produce comparable results*

One of the discussion points in the consultation was what the stakeholders have learned from their measurement activities and what they would like to explore further, or which questions remained unanswered. The themes mentioned were how innovation is managed within public sector organisations

and how learning takes place, innovation measurement at the individual (employee) level, international comparability, and other possibilities. Moreover, OECD's Innovative Capacity Framework and the Innovation Facets have identified measurement needs which have so far been partly covered in current measurement activities.

5.1 Innovation management and innovative capacity

While there is a clear demand to innovate in the public sector some of the innovation activities can conflict with core values of the public administration leading to an innovation paradox (Meijer & Thaens, 2021; OECD 2022). This innovation paradox can occur in innovative organisations, due to a lack of stability, absence of democratic control, waste of public money, disruption of power balance, undesirability and unforeseen security risks (Meijer & Thaens, 2021). Consequently, public sector managers need to analyse the negative risk aspects regularly and the decision to innovate then depends on whether the organisational culture, broader practices and public sector systems allows for experimentation, failure and broader implementation of new approaches or novel solutions (OECD, 2022). Organisational learning and capacity building is an integral part in addressing the issues to overcome barriers. Clausen et al. (2019) has shown that organisational innovative capacity has several positive effects on public sector organisation such as identifying demand for innovation in response to external political factors and policies as well as (inefficient) processes within the organisation. However, Daglio et al. (2015) identified several persistent barriers in the public sector that hamper organisational capacity to innovate such as a lack of feedback loops, transparency and working in silos. Increasing transparency and making information on innovation and innovative capacity more broadly available and embedded into the public sector operating system will induce an environment that supports innovation in the public sector (Daglio et al., 2015, OECD, 2022). Measuring public sector innovation is crucial in this regard as it makes it possible to identify, track, monitor and evaluate innovation activities.

The Oslo Manual (2018) recommends to collect the following innovation management capabilities in a (semi) structured questionnaire (wording adapted to the public sector):

- Identifying, generating, assessing, and pursuing ideas for innovation
- Organising innovation activities within the firm (i.e. aligning different innovation activities)
- Allocating resources to innovation activities
- Managing innovation activities conducted in collaboration with external partners
- Integrating external knowledge and other external inputs into a organisations' innovation activities
- Monitoring the results of innovation activities and learning from experience
- Exploiting and managing innovations and other knowledge that has been generated as part of a organisations' innovation activities

Data collection in surveys can for instance collect information on the use or importance of portfolio management, knowledge management systems, idea management, employee suggestion schemes, incentives, delegate decision-making to innovation staff etc.

Some PSI surveys have looked at this but there has been little discussion about what has been fundamentally learnt for PSI through these measurement efforts, at least in public sector circles. There is a lot of unknowns and assumptions about PSI based on primarily case study information, which does not lend itself to generalizability. Thus, there is a lot that remains unknown around different facets of PSI, including drivers across levels and steering different types of innovation, which hinders the ability for support measures (innovation explicit supports or implicit supports) to be developed.

5.2 Measuring PSI at the individual level

In the OECD Innovative Capacity Framework (Maur et al., 2022) the importance of engagement and building an innovative environment is stressed as in the public sector there are limited financial gains to achieve for individual employees as driver to innovate which may lead to less risk-taking and a lesser innovative mindset compared to the private sector. Results of a recent survey on public sector innovation has shown that the likelihood of innovating is higher in organisations where senior management gives high priority to new ideas or new ways of working, i.e. promoting a conducive environment for innovation (Arundel and Es-Sadki, 2021). Furthermore, several crucial factors to innovation success may reside on team level (composition, workplace creativity, size, collaboration practices, available networks etc. (e.g., Torgasa and Arundel, 2016)).

Collecting information at the individual employee level in their role in the public sector organisation and the role of teams is also mentioned by stakeholders. This can answer research questions such as how learning takes place and how and why innovation happens. Furthermore, this may help with understanding employee motivations in the public sector to undertake innovation projects, team characteristics needed for different innovations etc. – information that could be highly useful for developing training and also specifying HR practices (competences, hiring etc.).

5.3 International comparability

Results of the different measurement activities discussed in this report are sensitive to the choice of measurement methods, and it is therefore difficult to obtain international comparability without some uniformity in data collection and reporting practices. Even in practices that are closest to a somewhat uniform approach like the Innovation Barometer, have several differences in the methodology depending on the country[8]. Greater harmonisation in methods and core-questions in structured surveys are necessary in facilitating international comparability. A comparable, standardised international data collection appraoch is a useful goal. Uniformity alone, however, is not the aim as countries should consider measurement methodologies and research questions suitable to their context.

5.4 Other possibilities

Other possibilities for future research include impact and outcome measurement and also future-oriented needs assessment (areas where innovation in the public sector is potentially most needed). Current measurement tools are able to identify innovators and drivers of innovation in the general sense, but actual impact can be difficult to measure. Furthermore, current measurement tools are not precise enough to identify differences between drivers and barriers to different types of innovation (missions, anticipation etc.) and the complexity involved. Currently, in the OECD, efforts to measure trust in government are underway where also public sector innovation could play a role. In one of the consultations a suggestion was made to conduct a follow-up analysis with public sector organisations that were part of innovative actions to evaluate to what extent organisations have implemented the developed ideas and tools stemming from the research and measurement activities. Longitudinal studies can contribute in this regard by tracking the performance of public sector organisations over a longer time period. Furthermore, as mentioned above, connecting innovation drivers and barriers to different types of innovation (e.g., based on OPSI's innovation facets model) is also missing.

[8] Examples include, different survey samples, different questions and substantial differences in response rates ranging from 12% to 50% (Lykkebo et al., 2019).

OPSI Innovative Capacity Framework

The OECD (Maur et al., 2022) developed an Innovative Capacity Framework for governments to understand what influences the capacity of their public sector to innovate with the aim to achieve its goals and improve public outcomes. The Framework emphasises the need for a systemic and exploratory approach, recognising the importance of context specificity and not only individual and organisational factors that influence innovation (currently measured to some degree), but also systemic issues on how government is organised (e.g., budgeting rules, auditing, regulations). Moreover, the Framework aims to be measurable and hence provides possibilities for future measurement activities.

The Innovative Capacity Framework (OECD, 2022) aims to answer the following research question: What are the factors that may enable or hinder the public sector's capacity to use innovation, or innovative practices, to achieve its goals and improve public outcomes? This high-level research question is explored through the four focus themes within a system at the three levels (individual, organisation and system) that each have their own research questions and hence data needs to answer those questions.

A detailed framework that includes the relevant questions and potential data sources to answer those questions can be found in the OPSI Research protocol: Analysing and synthesising a public sector's innovation capacity (Kaur and Buisman, 2022). A summary with the key elements of this measurement framework can be found in the table below.

Table 2. Measurement needs of the Innovative Capacity Framework

Theme/level	Individual	Organisational	System
Purpose What is driving the intent to be innovative?	Motivation (intrinsic and extrinsic)	Institutional drivers External to the organisation drivers	National agenda and reforms, Global Challenges
Potential What elements across the system influence whether innovative efforts are attempted?	Work environment Job design	Leadership practice Organisational culture Strategy design approach Decision making practices	Political signalling Governance factors and context Normalisation and acceptance of innovation as a driver
Capacity What is needed to carry out innovative efforts and integrate them into everyday practice?	Mindset and practical ability Continuous learning Diversity	Conditions and support Innovation portfolio Project management Workforce strategy	Existing governance frameworks Ecosystems, partnerships (external knowledge sources) Data sharing
Impact How is the impact of innovative efforts understood and informing future practice?	Experience Performance Knowledge of results	Performance monitoring, audit and evaluation Perceived impact Learning impact	Performance, evaluation and legitimacy mechanisms Learning impact System level capacity

Source: Maur et al. (2022).

OPSI Innovation Facets

The Public Sector Innovation Facets model provides an easy way to consider what innovative approaches and instruments governments can use to respond to emerging challenges in a timely manner. It investigates questions such as: What types of public sector innovation exist? How are innovative ideas generated in the public sector? Which methods are used to support investment in innovative projects? What capacity and resources are required for public sector innovation?

OPSI's facets model identifies four innovation "facets" which can be used to explore the purpose and intent of innovation activities as well as how they work in practice. These include: enhancement-oriented innovation, adaptive innovation, mission-oriented innovation and anticipatory innovation (OECD, 2022).

A summary with the key elements of interest to measure as part of the OPSI Innovation Facets can be found in the table below.

Table 3. Measurement needs of the OPSI Innovation Facets

Innovation Facet	Measurement topics
Enhancement-oriented innovation	Public sector constraints on resources and costs Evaluation, auditing and performance measurement systems
Adaptive Innovation	Readiness to respond to change, the ability to innovate at a fast pace Adaptive organisational structures
Mission-oriented Innovation	Achieve ambitious goals Transformative innovation Address complexity and achieve systemic shifts
Anticipatory Innovation	Respond to complex challenges, such as climate change, aging societies and digital transformation How can public sector organisations make futures knowledge actionable

Source: Bleckenwegner (2021) OECD , link

Questions for discussion:

- **Are there any research gaps or possibilities for future activities not covered here?**
- **Which research gaps are most urgent/relevant in your country context that should be addressed first to help you advance public sector innovation?**
- **Beyond the insights collected during the consultation, what kind of topics do you think are worthwhile investigating into in regards to public sector innovation?**

6. Next steps and the role of the OECD

This study provides an overview of exiting opportunities and gaps in measuring public sector agenda as background to the discussion at the meeting of the National Contact Points. During this event, national delegates are invited to review the work so far achieved and provide input on this agenda going forward.

The OECD stands ready to assist national government in their efforts to support effective measurement of public sector innovation, which strengthens harmonisation of measures in support of better international comparability. Delegates of the Network of the OPSI National Contact Points are invited to reflect on how they wishes to further engage with this agenda including in collaboration with other technical groups across the OECD such as the NESTI (Network of Experts on Science and Technology Indicators).

Building on the work so far conducted (without prejudice to the results of the discussions at the meeting, which will inform the next steps in this area), some possible directions for this agenda could include:

- Use the input from member countries to refine the current paper into a framework of next steps that identifies key topics for benchmarking, possible usages / use cases (see section 1.1), level of analysis (system, organisational and individual level), methods and approaches
- Identify opportunities to support international comparison and sharing of lessons learnt on innovative capacity of public sectors
- Identify priority usage areas for conducting pilot measurement of public sector innovation and at which level. For example, this could include tracking system level features that contribute to strengthening the capacity of governments to innovate; or organisation-level measurement of innovation barriers; or individual level studies on PSI as part of innovation studies / scans to increase the knowledge base on PSI.
- Develop guidance material to inform and operationalise the framework and measurement approaches in collaboration with the OECD NESTI (Network of Experts on Science and Technology Indicators).
- Explore opportunities to add on and complement existing measurement agendas and indicators in the area of public governance, such as the Open Useful and Reusable Data Index included as part of Government at a Glance, where suited.

Questions for discussion:

- **Would guidelines on measuring PSI (innovative capacity or innovations undertaken) with the aim of increasing harmonisation across countries be helpful for your organisation?**
- **Which areas should be prioritised for measurement to increase cross-country public sector innovation comparability?**
- **How can the OECD support improvement of international comparability and learning across countries? :**
    1. **Creation of a databank of public sector innovation measurement initiatives, guidelines, measurement tools and other material**
    2. **Set up of a standing reflection group as part of the Network of the NCPs to discuss how to increase comparability of measurement approaches and tools such as questionnaires (possibly in collaboration with NESTI)**
    3. **Provide ad-hoc support to countries at different stages of the measurement process (ideation, prototype, implementation, analysing results, developing reports for different users)**
    4. **Other?**

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Annex A. Definitions

Innovation

There are many definitions of innovation for the public sector, most of which include the concept of novelty (something new) and utility (the innovation is better than what existed before) (Mulgan and Albury, 2003; NAO, 2006). For constructing indicators of prevalence, a definition of innovation must also refer to a defined time period in which the innovation occurred (observation period) and an innovation must have been implemented or made available for use, either by the innovative organisation itself, as with process innovations, or offered for use by others, as with service innovations for citizens. The requirement for implementation means that inventions, ideas under development, and prototypes are not innovations.

The OECD's Oslo Manual provides guidelines for measuring private sector innovation and innovation activities and has been used by National Statistical Organisations in 115 countries to measure innovation in the business sector. The fourth edition of the manual (OECD/Eurostat, 2018) includes a universal definition of innovation that is applicable to all sectors, including the public sector. The definition is as follows:

> *An innovation is a new or improved product or process (or combination thereof) that differs significantly from the unit's previous products or processes and that has been made available to potential users (product) or brought into use by the unit (process).*

A 'unit' can be any organisational entity, such as a public sector agency, department or work group. The definition includes novelty (differs significantly) and implementation (made available to users or brought into use), but it does not include the concept of utility, although this can be added as a restriction (Gault, 2018). The advantage of using a general definition of innovation that is compliant with the Oslo Manual is that it permits comparisons between innovation data for the public sector and data for other sectors, such as the business sector. Many of the existing surveys on innovation in the public sector that were conducted after 2010 use definitions that are largely compliant with the third Oslo edition of the Manual, published in 2005.

Of note, the Oslo Manual uses a broad definition of innovation that is defined in relation to the unit itself (differs significantly from the unit's previous products or processes). This means that 'significance' is defined from the perspective of the unit, instead of in reference to some other yardstick for novelty, and that an innovation can occur through adopting ideas that were originally developed by other organisations. In the latter case, innovation occurs because of diffusion. This can be especially relevant to public sector organisations that innovate through adopting good practices that are already used by other government organisations or by businesses.

Drawing on the Oslo Manual definition of innovation in the private sector, the Observatory of Public Sector Innovation (OPSI) at the OECD has adopted a working definition of public sector innovation as "the process of implementing novel approaches to achieve impact" (OECD, 2017[7]). In the broadest terms, public sector innovation comprises three components: **novelty**, **implementation,** and **impact**. While private sector innovation usually aims to gain competitive advantage, the same metric cannot be applied in the public sector. Thus, "impact" usually means a shift in public value (OECD, 2019[13]). In general, public value represents a normative consensus of prerogatives, principles, benefits, and rights that can be attributed to both governments and citizens (Jorgensen and Bozeman, 2007[9]), and linked to a variety of values like

effectiveness, transparency, participation, integrity and lawfulness. OPSI also delineates innovation in the public sector based on its directionality and level of uncertainty (read further OECD, forthcoming). Based on the OPSI's innovation facet model described four different types of innovation:

1. **Enhancement-oriented innovation**, which upgrades practices, achieves efficiencies and better results (exploitative innovation), and builds on existing structures without directly challenging the current system.
2. **Adaptive innovation**, which tests and tries new approaches to respond to a changing operating environment and citizen needs without a clear pre-determined direction.
3. **Mission-oriented innovation**, which sets a clear outcome and overarching objective – directive – for achieving a specific time-bound and concrete challenge.
4. **Anticipatory innovation**, which explores and engages with emergent issues that might shape future priorities and future commitments and may be highly uncertain in nature.

Innovative capacity

Public sector innovative capacity relates to the elements within and interacting with public sector systems that help or hinder governments to use innovation to achieve their goals. Measuring the features (e.g. presence and intensity) of such factors allow to better understand the individual levers – and their combination - that governments can activate to create environments conducive to innovation. These factors include the overall environment and context related to a public sector system and its organisations, the key governing mechanisms and policymaking and delivery practices in place, rules and regulatory frameworks, explicit strategies, structures and supports for innovation within the system, organisational work environment and culture, and individuals knowledge and capabilities. These factors may lie on the systems level (e.g., legislation that applies to all, budgeting rules), organisational level (corporate management styles) and individual level (how civil servants are trained), but analysis requires an examination around all levels. Overall, innovative capacity is about steering the overall public sector system to support the use of innovation as a strategic function to help governments achieve outcomes.

Innovation management

Innovation management relates to the explicit supports and professionalism within organisations to manage innovation. While innovative capacity touches on this at a broad level, innovation management provides a deeper dive into the specific supports particularly at the organisational and individual level in producing different types of innovation. The Oslo Manual (OECD, 2018) defines innovation management as all systematic activities to plan, govern and control internal and external resources for innovation. *Innovation management can include establishing an innovation vision, innovation policy and innovation objectives, and innovation strategies, innovation processes, structures, roles and responsibilities and innovation support, to achieve those objectives through innovation planning, innovation operations, performance evaluation, improvement and other activities* (ISO/TR 56004:2019). Measuring innovation management allows to establish and appreciate factors which can inform strategic decisions at organisational level. These include: how resources for innovation are allocated, the organisation of responsibilities and decision-making among employees, the management of collaboration with external partners, the integration of external inputs into a firm's innovation activities, and activities to monitor the results of innovation and to support learning from experience. Innovation management includes activities for establishing policies, strategies, objectives, processes, structures, roles and responsibilities to deal with innovation in the firm, as well as mechanisms to assess and review them.

Innovation management versus innovative capacity

The OECD recognised that public sector organisations are working within existing, imperfect and complex systems and that innovation in the public sector often happens within a larger context (OECD, 2022). In this context, major disruptive innovations happen sporadically but are often driven by the broader public sector system that is influenced by (political) reforms and agendas. Further, a government's innovative capacity is influenced by, and needs to be considered at, all levels of the public sector system from individuals, units, organisations and systems.

From the OECD innovative capacity framework we learn the following:

> *"The systemic view considers innovation in an integrated and holistic manner. It includes a broad range of structural factors, drivers and multidimensional policy contexts, both within and between levels of government and society (OECD, 2020). Taking a systemics perspective of the public sector can assist countries to analyse how their innovation capacity interacts within existing systems, rather than being an alternative to them. OECD country analyses, for example, seek to improve understanding of the role public organisations and public sector employees play in innovation activity across different levels of the system." (Kaur et al, 2022)*

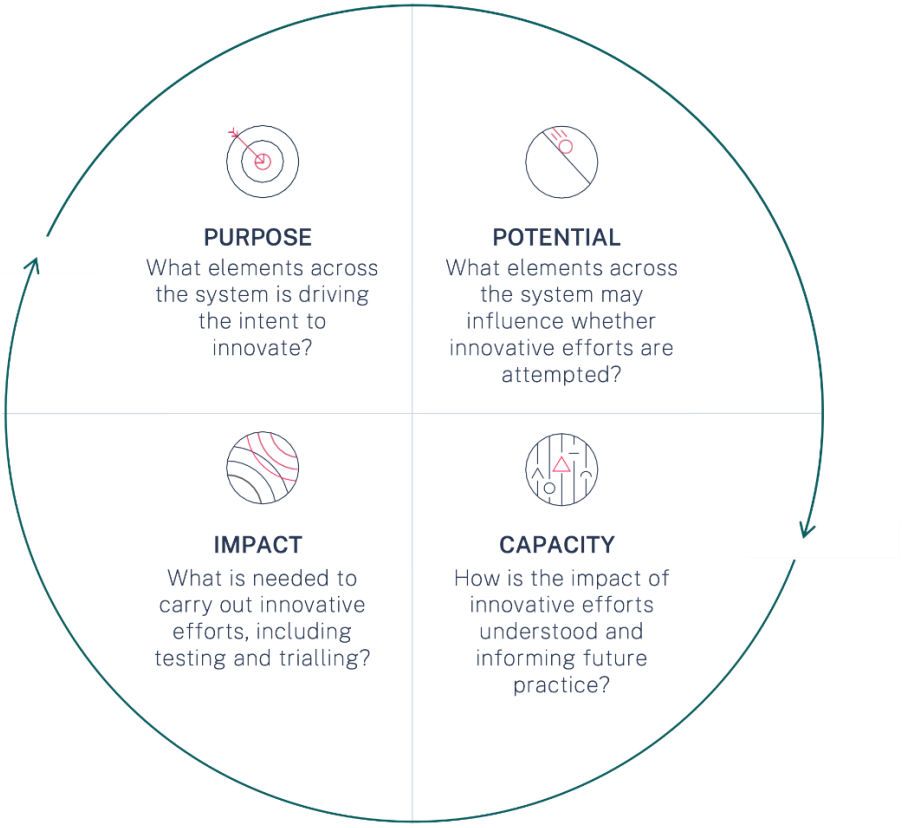
Innovative capacity examines the overall purpose, potential, capacity and impact of governments in using innovation and innovative approaches to address complex challenges and achieve outcomes. In order for governments to do this, they need to have an understanding of what innovation is, and the difference between their 'run' activities vs those the portfolio of activities that may seek to create a change across several facets (whether it is around taking action today for future trends or opportunities, to achieve grand missions, adapt to changing environments or enhance existing processes and practices).

To be able to undertake, manage and achieve impact from the range of innovation activities, governments need to actively promote and manage innovation, with the necessary explicit innovation supports (such as funding, processes, structures etc). Thus, Innovation management plays a crucial role in this regard as it enables public sector managers to have visibility and influence the process leading up to the innovation. Innovation management practices are relevant across all these levels although the practices can differ between the different levels and contexts. Actors differ in how they navigate in this complex setting where some are able to respond pro-actively and other are laggards that adopt innovative practices.

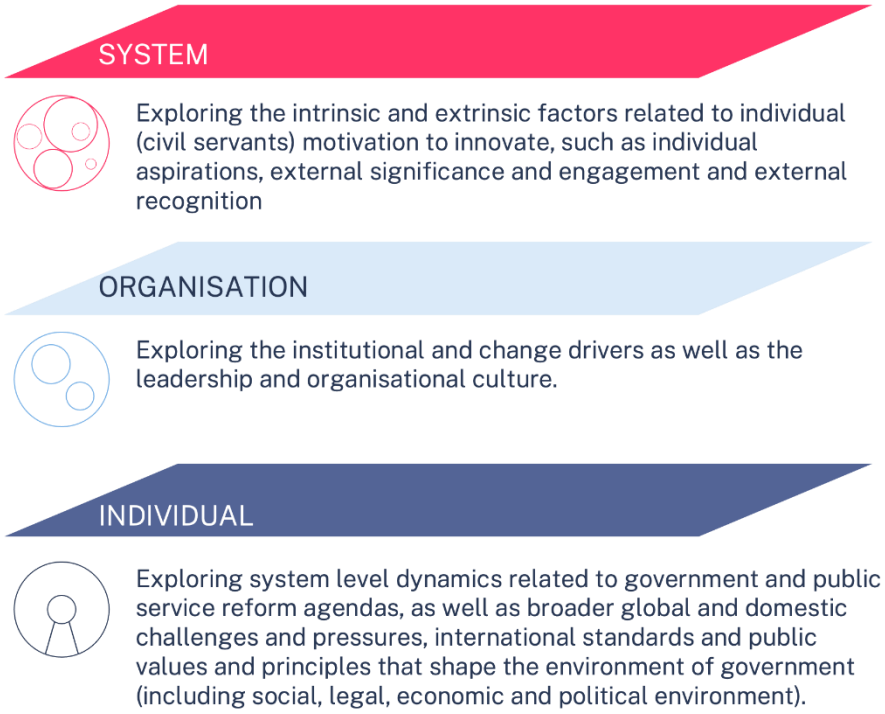
However, the overall operating environment, broader governing mechanisms and practices will influence whether innovation can start, be implemented or take impact. Therefore, it is important to understand how innovation, and innovation supports are embedded and integrated into the broader public sector governing system, including for example, in audit, HR, regulatory, budgetary, project management, and policymaking and evaluation frameworks.

The OPSI Innovative Capacity Framework

The Innovative Capacity Framework is a resource developed by OPSI of the OECD that intends to help government to understand and collect data on the factors that enable or hinder their public sector's capacity to use innovate. The Framework's methodology examines innovation systems and recognises the context-specificity in which innovation takes place while simultaneously enhancing the comparability of country experiences (OECD, 2022). The Framework further aims to leverage drivers and barriers to ensure innovation achieve their intended goals. The Framework is built on four focus theme, Purpose, Potential, Impact and Capacity that can be explored at three levels of analysis, see the figures below.



The four themes of the OPSI Innovative Capacity Framework (OECD 2022).



The three levels of analysis identified in the OPSI Innovative Capacity Framework (OECD 2022).

A complete description of the Innovative Capacity Framework and how data can be collected can be found in the OECD publication Kaur, M. et al., (2022) https://dx.doi.org/10.1787/52389006-en

Public sector

The public sector is defined in the System of National Accounts (UN, 2008) as all government entities plus government-owned corporations. In this paper we follow common practice in management research and exclude government-owned corporations from the public sector.

Annex B. Summary table of consultations with National Contact Points

Table A B.1. Summary consultation table

Country interviews	Year(s)	Measurement model	Target group	Objectives	Usage	Benefits of measurement framework	Challenges of measurement framework	Resources	Unanswered questions	Possibilities for future	Role OECD
Canada	2022	Survey on impact change challenge Link	Public sector Jurors Participants	Survey on challenges programme Are challenges effective? Who participates and why?	Majority found program appropriate mechanism to address the problem area	Effective policy approach Programme delivers on intended outcome	Self-reporting biases in terms of successfulness of the programme		Investment analysis or a patent analysis to examine the economic or environmental outcomes	Crunchbase investment analysis	
Canada	2022	Social network analysis	Stakeholders of the challenges programme	Assess the public's awareness of an issue Mobilisation of new talent	Understand the outcomes of the challenges To plan future challenges more effectively	Effective in drawing new talent and engaging non-traditional actors	Many organisations don't have social media accounts			Foreseen to repeat social network analysis (pre and post)	
Canada	2022	Feasibility study (participants data linked with BR)	Policy makers	Evaluate success	Examine growth in employment	Ability to link data	Early-stage research		Portfolio measurement		
Canada	Behavioural science unit	Rapid online surveys	General public	Understand drivers and barriers to change behaviour	Behavioural insight team	Ability to test interventions and measure their success					
Netherlands	2021	Structured questionnaire survey	Organisational level (Ministry departments and municipalities)	Identification of success factors and barriers to innovation Raise engagement International benchmarking	Results discussed with senior government officials Improvement of policies Development of index of innovation climate	Questionnaire not too difficult Based on Innobarometer Ability to link results with other studies	Sufficient respondents Multiple respondents to answer survey	1 FTE (70,000k) distributed over 3 people excluding survey work which was outsourced	Learning and inputs into learning Mechanisms of working together	Surveying individual employees (e.g. in labour survey) Combine information from multiple sources	Benchmarking core questions, leave room for national context Organise capacity building activities Flexible approach
Colombia	Annual survey (8 years)	Structured questionnaire survey	Organisational level (Ministry departments, municipalities, agencies and other	To produce the Capacity Index To promote PSI , increase capacity to innovate and remove barriers	Foresight analysis Cluster analysis at organisational level Index is in national development plans Benchmarking with Chili, collaboration	Large questionnaire with 300 questions, mandatory, leads to 120 indicators that are used to construct the	Data is from secondary source, but the team worked for 3 years on the methodological part to construct	2019 – 2 people 7 people part-time for 6 month 2021 – 10 5 for 6 month 1 person full time to make the instrument 2 full-time persons	Follow-up with services to public sector organisations	Index will be continued but the 120 indicators will be reviewed	How to measure and evaluate PSI and how to generate public value

			institutions)		with IADB	capacity index	the capacity index	Review and design of the document Launch event			
Finland	2018 & 2022	Structured questionnaire survey	Organisational level (Ministry departments and municipalities)	PSI measurement Module on experiments in municipalities Sustainable innovations in municipalities	Publish the results together with Ministry of Finance. Website to inform citizens.	Based on the Innobarometer (Denmark). Nordic country representatives meet once a month in innovation hub to discuss PSI.	Classical typology of innovations (service, process, organisational) is not rich enough many innovations are more systemic		How are innovations managed? Is there a separate programme? Part of the strategy or development unit?	Foresight analysis On which topic would the org. like work on in terms of PSI (incubator like)	The Nordic Innovation Hub as a model. Real stakeholders and decision makers should be involved. Evaluation.
Finland	H2020 (2017-2021)	Innovation Action	Public sector, civil society and commercial actors	To develop practical resources Real-life pilots to co-create with various combinations of public sector, civil society and commercial actors	Presentation at national level Tool books Academic papers, white papers			1.83 FTE	Implementation of tools and material developed requires follow-up with public service actors	Importance of implementing and follow-up in an incubator fashion (not evaluation)	COSIE framework; public service innovations can be achieved by creating collaborative partnerships between service providers and service beneficiaries (co-creation)
Written consultations											
Sweden	2018 & 2022	Structured questionnaire survey	Organisational level (Ministry departments and municipalities)	Achieve a better understanding innovation and innovation activities in the public sector in a broad sense	Basis for decision-making, debate and research supporting PSI Self-evaluation tool for participants (SALAR) Swedish Agency for Public Management wants to track governmental agencies on innovation	First survey based on Innovation Barometer but adapted to Swedish context Second survey more in collaboration with Statistics Sweden using knowledge of private sector survey	Some differences in RR. Suspect that the concepts of innovation might be an obstacle to respondents Non-response analysis by Statistics Sweden	0.6 FTE @ Vinnova during 2 years	Innovation procurement Innovation management	Holistic approach (inputs, outputs and outcomes) at different levels unit and whole organisation. Individual level through interviews and case studies Systemic through accumulating lower level measurement data	OECD can engage discussions to make PSI part of official statistics (possibility to collaborate with private sector innovation survey)
Sweden	2022	Structured questionnaire survey	Organisational level (Ministry departments and municipalities)	Extend CIS to private sector to have a more complete picture for innovation policies Aligning questionnaire with OM		Questionnaire well understood but RR was low (29%) likely due to voluntary nature of the survey. By conducting the survey engagement was raised on the topic	No major challenges except the general issue with the concept of innovation in innovation surveys Non-response survey showed no differences in	1 FTE (different people/responsibilities)		Make survey part of Sweden's official statistics alongside CIS (mandatory) Comparability with the CIS needs to be further improved and the	More involvement of NSIs: OPSI and NESTI work together on PSI to build a common base for measuring PSI to harmonise collection and ensure

						of PSI	propensity to respond to the survey between innovators and non-innovators			questionnaire itself aligned with updated practices	comparability
Iceland	2 rounds	Structured questionnaire survey	Organisational level	Gathering information on what kind of innovation is going on in PS Direct initiatives better and build these around facts	Raise engagement on the topic of PSI Currently low demand for data, only a ministry has used it	Information from the description of innovative projects was very useful	In the first round the questionnaire was rather long, in the second round the questionnaire was shortened The survey is a self-evaluation and this has its disadvantages in terms of subjectivity	1st round spent more time on methodology etc 2nd round 1 FTE for 1 month	Target individuals (employees) asking them to describe the innovation	Collect information at different levels (not only at executive level)	Other types of measurement
Norway	2018 & 2020	Structured questionnaire survey	Organisational level (municipalities and regions)	Benchmarking Create another image of PS i.e. its innovative	Use results in discussions with state authorities Concrete projects with municipalities and regions identifying strengths and weaknesses Academic research	Build upon Innovation Barometer work and able to collaborate with COI of DK			Drivers of innovation	Cross-sector innovations Collect more information on why innovations happen (drivers)	
						Desk research					
New Zealand	2020	Structured questionnaire survey	Public sector organisations	Identification of success factors and barriers to innovation Raise engagement International benchmarking	Provide senior leaders interactive data highlighting strengths and areas for improvement and recommendations	Data collection on Collaboration, Leadership, People Empowerment, Rules & Systems and Innovative Outputs				The Innovation Barometer is to be offered to another set of public sector agencies. The goal is to scale across a larger portion of the public sector each year	
New Zealand		Case-studies		Support public sector managers to build capacity and share knowledge	How innovation has happened in New Zealand link						
Czech Republic	2021	Structured questionnaire survey	Organisational level (Ministry departments, municipalities, agencies and other institutions)								
Portugal	2020	Innovation Panel for the	Organisational level	Develop instrument for	Consolidated organisational level	Experimental configuration	Stabilise measurement		Case-studies to analyse	Explore advantages of	Promotion of measurement and

		Public Sector		monitoring and adapting innovation strategies	report on innovation practices for each of the participants Innovation dashboard to identify strategic options	Focus on needs of users	process		innovation strategies at micro-level Thematic dossiers with guidance and information Modulation of data to present to different actors in PSI	using existing administrative data	evaluation in a sustained manner

Source: OECD.