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Results of Pilot Research on Criteria Framework for Measuring Innovation in the Public Sector in Viet Nam

Ha Noi, December 2022

The series of Governance and Participation Policy Discussion Papers is commissioned by the Governance and Participation Team at UNDP Viet Nam.

The series aims to analyse trends in Viet Nam regarding the implementation processes and options in specific public administration reform areas. In order to confront the social, economic, political and environmental challenges facing Viet Nam, policymakers need to adopt evidence-based decision-making. These policy papers aim to contribute to current policy debate by providing discussion inputs on policy reforms – thereby helping to improve Viet Nam's development efforts.

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Citation: Viet Nam National Innovation Center (NIC) and the United Nations Development Program (UNDP) (2022). **Results of Pilot Research on Criteria Framework for Measuring Innovation in the Public Sector in Viet Nam.** A Joint Policy Research Paper on Governance and Participation commissioned by the Viet Nam National Innovation Center (NIC) and the United Nations Development Programme (UNDP) in Viet Nam *[an unofficial translated version]*. Ha Noi, Viet Nam: December 2022

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LIST OF ABBREVIATIONS

APS	Australian Public Service
APSC	Australian Public Service Commission
APSII	The Australian Public Sector Innovation Indicators
DIISR	Department of Industry, Innovation, Science and Research
EPSIS	European Public Sector Innovation Scoreboard
ICT	Information, Communication and Technology
IT	Information Technology
MEPIN	Measuring public sector innovation in the Nordic countries
MPI	Ministry of Planning and Investment
NESTA	The National Endowment for Science, Technology and the Arts
NIC	National Innovation Center
PSII	Public Sector Innovation Index
R&D	Research and Development
UNDP	United Nations Development Programme

ACKNOWLEDGEMENT

The research team would like to express our deepest appreciation to the Foreign Investment Agency, the Business Registration Management Agency and Public Procurement Agency (Ministry of Planning and Investment) and the Department of Planning and Investment of Quang Ninh Province, the Department of Planning and Investment of Ninh Thuan Province and the Department of Home Affairs of Dak Lak Province for enthusiastically assisting us in the process of surveying and piloting the innovation criteria framework in the public sector.

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We would sincerely thank for the professional support of experts from the United Nations Development Programme (UNDP) in Viet Nam, including Mrs. Dang Phuong Thanh, Project Manager; Mrs. Tran Huong Giang, Co-Head of Innovation Department (in charge of piloting).

We would also like to thank Assoc. Prof. Dr. Le Thu Ha and colleagues at FTU Innovation and Incubation Space, Foreign Trade University; Dr. Tran Ngoc Ca (Institute of Technology, Management and Innovation, Ministry of Science and Technology), Assoc. Prof. Dr. Nguyen Chien Thang (Director, Institute for European Studies, Viet Nam Academy of Social Sciences), Mr. Pham Ngoc Thach (Deputy Head, Legal Department, Viet Nam Chamber of Commerce and Industry), Mr. Vu Kiem Van (Deputy General Secretary of Viet Nam Digital Communications Association), Assoc. Prof. Dr. Hoang Van Hoan (Deputy Director, National Academy of Politics Region I), Mr. Vu Dang Minh (Chief of Office of the Ministry of Home Affairs), Dr. Pham Quang Ngoc (Independent Expert on Innovation), Mr. Nguyen Hong Chinh (Lecturer at Academy of Finance, Expert on Innovation), Mr. Ly Dinh Quan (CEO, Songhan Incubator), Dr. Tran Toan Thang (National Centre for Socio-economic Information and Forecast, Ministry of Planning and Investment), Mr. Nguyen Hung Hue (Administrative Procedures Control Agency, the Office of the Government), Dr. Nguyen Duc Dung (Lecturer at Hanoi University, Independent Expert on Innovation) and other experts that have given valuable suggestions to improve this criteria framework and report.

Finally, our special thanks to the Australian Department of Foreign Affairs and Trade (DFAT) and the United Nations Development Programme (UNDP) in Viet Nam for funding this research through the component Citizen Powered Innovation Initiative under Viet Nam Provincial Governance and Public Administration Performance Index of UNDP.

The perspectives and recommendations in this report do not necessarily reflect the perspectives of the Viet Nam National Innovation Center (Ministry of Planning and Investment) and UNDP Viet Nam as well as other funding agencies. The content and analysis contained in the report, together with any possible errors of interpretation, are solely with the research team.

EXECUTIVE SUMMARY

This report aims to test the development of a criteria framework for measuring innovation in Viet Nam's public sector. To do so, the team has done some following tasks. Firstly, we extensively reviewed related theories, survey methods and measurements of innovation in the public sector in the world as the basis for the research methodology to develop the framework for Viet Nam as the concept of innovation in the public sector has been relatively new in Viet Nam. Second, we developed a criteria framework based on the approach of innovation as a process and the framework consists of four components, namely Innovation Inputs, Innovation Capability, Innovation Process and Innovation Outputs. The Innovation Inputs component considers the following aspects: human resources, innovation finance/investment, infrastructure and policy. The Innovation Capacity component includes the following elements: organizational leadership and culture, innovation strategy, innovation motivation and innovation management. The innovation Process component includes the following aspects: approach, selection, development and implementation of ideas, innovation cooperation, and innovation assessment. The Innovation Outputs component considers 4 types of innovation (product/service innovation, process innovation, communication method innovation and policy innovation) that have been implemented in the last 2 years on two aspects of novelty and impact.

Third, the pilot survey to evaluate innovation activities in the public sector was carried out after developing the criteria framework. The survey was conducted at the ministerial level (National Innovation Center, Foreign Investment Agency, Business Registration Management Agency and Public Procurement Agency under the Ministry of Planning and Investment-MPI) and provincial level (Department of Planning and Investment of Quang Ninh Province, Department of Planning and Investment of Ninh Thuan Province and Department of Home Affairs of Dak Lak Province). We gathered a total of 37 valid submissions, 22 at the ministerial level and 15 at the provincial level. Results from the survey are valid only in the surveyed units.

Here are some key findings from the pilot survey:

- Regarding innovation outputs, process innovation is the most commonly implemented (54.5% of respondents in MPI and 60% of respondents in 3 provinces implementing process innovation) followed by product and service innovation.
- Regarding innovation inputs, the percentage of respondents assumes that cadres, civil servants and public employees of their units meeting the requirements of proposing and implementing innovation is relatively high, but they still lack the capacity to take risks, and willingness to accept change/innovation. Units are still facing financial difficulties and lacking information technology (IT) equipment and machinery for innovation. The percentage of respondents whose units have promulgated regulations on innovation is still low, but most of them agree that the process and procedures for innovation at their units are quick and flexible. All aspects of administrative reform help promote change/innovation.
- Regarding innovation capability, the role of leaders in supporting and promoting innovation activities at surveyed units is highly appreciated. About 68.2% of respondents at the MPI and 35.7% of respondents from 3 provinces said that their units already have had innovation strategies, mainly medium-term strategies. Innovation motivation mainly comes from informants (who want to improve work efficiency; possess curiosity and eagerness to learn), the incentives of the unit also have certain effects in promoting innovation. Risk management related to innovation activities is underestimated compared to innovation in order to improve efficiency and effectiveness.
- Regarding the innovation process, only 10 out of total 22 and 6 out of total 15 informants interviewed in MPI and in 3 provinces, respectfully, claimed that in the previous year, their units recognized

innovative ideas/solutions and only about one-third of respondents said there are systems to evaluate and develop innovation ideas of cadres, civil servants and public employees in their units. The interviewed units paid close attention to innovation cooperation. More than 65% of respondents in MPI and 3 provinces said that their units have carried out an innovation assessment in the past 2 years. While the provincial unit mainly self-assess through the feedback of service users, the surveyed units under MPI use both self-assessment and assessment through a professional unit.

A review of innovation policy in Viet Nam reveals that there is currently no particular regulation and policy for innovation. The policy to promote innovation in Viet Nam is unsystematic and comprehensive, and biased towards innovation for start-ups, science and technology. Policies are dispersed in different aspects and are ran by different ministries, departments and sectors. Accordingly, the report proposes the following policy recommendations:

- Regarding institution: It is necessary to focus on improving institutional quality and policy-making capacity. In which, issuance of a specific strategy for innovation is of the essence. This strategy should separate the objectives, policies and financial mechanisms of the public sector and the private sector. It is also necessary to review and propose amendments and supplements to the system of legal documents in specialized fields to meet the requirements of adjusting new relationships arising in innovation, removing bottlenecks and barriers, creating favorable conditions for innovation. It is important to refer to and learn from the experiences and lessons of developed countries and countries with similar conditions to develop policies to encourage and promote innovation.
- Regarding the national innovation system: It is necessary to strengthen the National Innovation System to systematize innovation policy; define innovation goals and visions for each ministry and sector; and measure innovation effectiveness in each period to adjust policies accordingly. The participation of leaders at the highest level is required to promote innovation comprehensively, systematically and effectively.
- Regarding innovation infrastructure: It is necessary to develop an e-government infrastructure across 3 levels (national, ministerial and provincial levels) meeting the management and direction of state administrations in the digital environment, towards providing all public administrative services in the digital environment. Building and developing infrastructure for research and development centers and innovation is critical while proposing mechanisms and policies to build and operate innovation centers in general and in the public sector in particular to develop national innovation ecosystems closely linked with the region and the world.
- Regarding human resources: Developing highly qualified, creative and innovative human resources, and assigning them to be in charge of innovation. Increasing investment in training innovative human resources for the public sector must not be neglected while creating a mechanism to attract talents to work in the fields of innovation in the public sector should be seriously considered.
- Regarding innovation investment: Funding from the state budget is important to cognitive transformation, institutional creation, digital infrastructure development, digital platform development, and innovation while increasing public investment in IT projects in state agencies.
- Regarding policies on cooperation, research and development, innovation: Active promotion of cooperation and international integration on innovation, especially policy exchange; advanced science, technology and innovation management models; and experiencing in implementing innovative models and solutions are of importance.

Nevertheless, several limitations remain in this report, indicated as follows: First, most of the international measurements of innovation in the public sector are from Western countries. That has limited the view of the research team on innovation in the public sector to suit the political characteristics and identity of Asian

countries. Second, there is no legal basis to force public units to conduct the survey. Third, in-depth interviews have not been conducted for insights and solution and/or policy recommendations. Fourth, the criteria framework does not include soft infrastructure indicators and specific and specialized indicators for ministries, branches, regions and provinces. Fifth, some unclear terms and questions remain as limitations of this research as terms and questions were translated from English and we found difficult to find exact words or examples in Viet Nam.

In the future, it is necessary to continue studying and exchanging international experiences, inheriting existing sets of indicators in Viet Nam (Provincial Competitiveness Index (PCI), Viet Nam Provincial Governance and Public Administration Performance Index (PAPI), Public Administration Reform Index (PAR-index), Satisfaction Index of Public Administrative Services (SIPAS), Digital Transformation Index (DTI), Indexes to evaluate efforts in reforming business regulations) to update a more suitable criterial framework for measuring innovation in the public sector with the practical implementation in Viet Nam and towards the goal that Viet Nam belongs to the group of 30 leading countries in innovation (GII) by 2030. Besides, there is a need to continue adding specific and specialized indicators for groups of ministries, sectors, provinces and different groups of sectors. Ministries, sectors and local governments can make use of this criteria framework for pilot measuring innovation, which can serve as evidence to urge and promote innovation in their units and expand the measurement of innovation in the public sector, targeted to become an annual activity from 2023 onwards. Finally, integrating the innovation index in the public sector into the Public Administration Reform Index (SIPAS) when there is no specific strategy for innovation in the public sector should be considered.

INTRODUCTION

Over the past decades, Viet Nam has made remarkable achievements in economic development based on innovation and the application of advances in science and technology. The Global Innovation Index (GII) 2022 showed that Viet Nam ranked 48 out of 132 countries and territories and belonged to the group of countries that have made the greatest progress over the past decade. Studies at Viet Nam Venture Summit 2022 showed that Viet Nam was in the golden triangle of Southeast Asia for investment in innovation in general and startups in particular.

It can be promulgated that Viet Nam's innovation ecosystem has begun to form and achieve significant progress in recent years, especially in the private sector. However, international experience shows that in order to build a sustainable and synchronous innovation ecosystem, the involvement of each cadre, civil servant, and public employee in the public sector is fundamental to create an effective innovation ecosystem.

The promotion and improvement of public sector performance is a key objective of governments. Improving the capacity to identify and evaluate innovation in the public sector, especially in policy formulation, service delivery is essential for public policies and services to target and respond better and more effectively to community needs. Innovation becomes important when traditional approaches cannot solve the complex and intractable problems facing society.

After a process of research and in-depth consultation based on international and domestic experiences, realizing the importance of a criteria framework for measuring innovation in the public sector, the Vietnam National Innovation Center (NIC), the Ministry of Planning and Investment, and the United Nations Development Programme (UNDP) have piloted the development of a framework for measuring innovation in Viet Nam's public sector. This research project is part of the Citizen Powered Innovation Initiative (CPII) under the Research Programme of Provincial Governance and Public Administration Performance Index (PAPI), with the main funding from the Australian Department of Foreign Affairs and Trade (DFAT).

The objective of this research is to develop a toolkit so that public sector entities can measure their own innovation levels, assess progress over time, and trace the causes of their innovation achievements and/or limitations. The study consisted of two steps. Step 1: the research team develops a framework for measuring innovation of public sector entities at the ministerial and provincial levels, including the criterial framework and research questions, based on an overview of domestic and international research literature. Step 2: the team conducts a pilot survey to (i) collect basic information on the innovation situation of ministerial and provincial agencies, influencing factors, innovation process and results creation; (ii) evaluate the reasonableness and feasibility of the Information Collection Form and the Criteria framework for measuring Innovation in the public sector; finalize the Information Collection Form and the Criteria framework; and (iii) draw lessons from experience and shape perspectives for the next steps of NIC in particular, and Viet Nam's innovation ecosystem in general.

The report is divided into five parts including the Introduction. *Part I* presents the concept and overview of innovation policy in Viet Nam. *Part II* presents research methodology to develop a set of criteria to measure innovation in the public sector, including: international experience in measuring innovation in the public sector and measurement methodology. *Part III* introduces the results of the pilot survey and *Part IV* presents conclusions, policy recommendations, lessons and next steps. In addition, the *Appendix* provides details on a number of public-sector innovation indexes around the world and the results of measuring innovation in the public sector through pilot surveys.

I. INNOVATION DEFINITIONS AND INNOVATION POLICIES IN THE WORLD AND IN VIETNAM

I.1. Theoretical overview

I.1.1. The public sector

The public sector (or state sector) is an area of economic, political and social activities in which the State is the decision-maker (Vu et al., 1998). According to the Law on Thrift Practice and Waste Combat 2013, "The

state sector includes agencies and organizations established, invested in facilities, allocated all or part of the operating budget by the State, directly managed or participated in the management by the State in order to serve the common and essential development needs of the State and society". Accordingly, public sector is an area owned, all or partly invested by the State and directly or managed or by the State to create products and services to serve the common and essential development needs of the state and society[1]. In which, public services include public administration and public services provision. The public sector includes the public services sector and public enterprises sector[2]. In which, public services include public administration and public services provision.

Public administration can be understood as activities that serve the basic rights and obligations of organizations and citizens, performed by state administrative agencies. Public or general-interest services include non-market services (e.g., compulsory education, social protection), State obligations (e.g., security and justice) and services of mutual economic benefit (e.g., transportation, energy and telecommunications) (Bloch, 2011).

Figure 1: The public sector by organizational structure

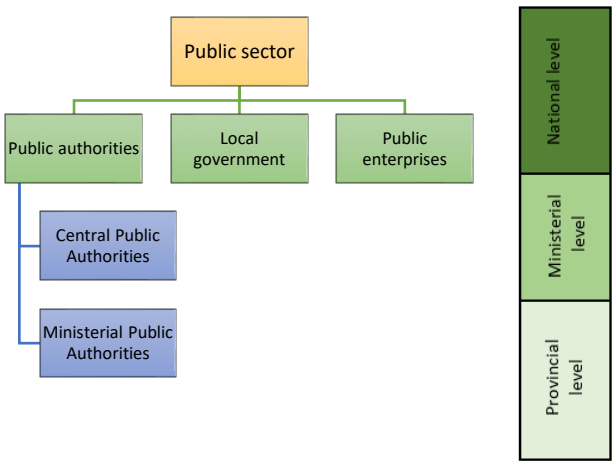
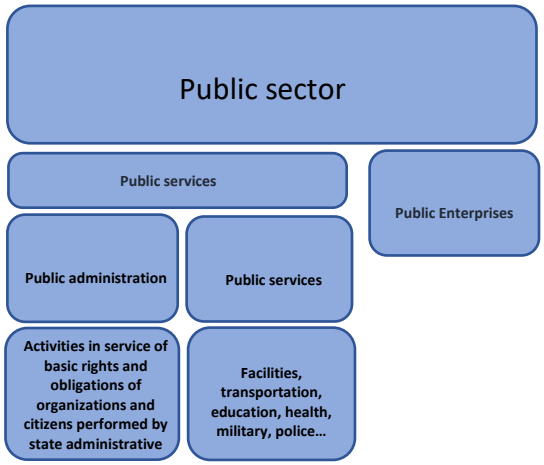


Figure 2: The public sector by function



Source: Compilation of the research team

The public sector is spread vertically at 03 levels: national, ministerial and provincial level. By organizational structure, the public sector includes public authorities, local government and public enterprises. In which, public authorities include central public authorities and ministerial public authorities.

I.1.2. Innovation

In recent years, innovation has been promoted in Viet Nam on the basis of learning from international experiences. In this part, the research team introduces some perspectives on innovation based on international experience, to help form an innovation assessment framework suitable for the public sector in Viet Nam.

[1] Activities of the public sector include: (i) activities to ensure the effective operation of the national legal system (activities associated with state management or state administrative management), activities producing and supplying goods and services for the society (Vu et al., 1998).

[2] According to Bloch (2011), public sector was determined based on the ownership or observation, while public service was determined based on the functions or activities.

Through reviewing the literature, the research team found that the concept of innovation was officially mentioned in the Western countries by Joseph A. Schumpeter (1912)[3] in the *The Theory of Economic Development* written in Austrian. By 1934, the book was translated into English and since then the concept of innovation has become widely known. Schumpeter (1934) defined production "as the combination of factors and motivations to the possible extent" and innovation as "the combination of those factors in new ways" (Schumpeter, 1934). New combinations, according to Schumpeter are "(i) the introduction of a new or improved product, (ii) the introduction of a new production method, (iii) the discovery of a new market, (iv) the access to new sources of raw materials or semi-finished products, (v) implementation of a new organizational structure". He further elaborated on each case: (i) new or improved products are products unknown to consumers, or products of higher quality; (ii) a new production method that has not been tested by experience, not necessarily a new scientific discovery, but possibly a new way of selling; (iii) a market that the enterprise has never approached even though it has already existed before; (iv) this supply may already be existing or nascent, (v) for example, creating a monopoly position (Schumpeter, 1934, p. 66). He also emphasized that these combinations were discontinuous. It breaks the old equilibrium and creates a new equilibrium.

Inheriting from Schumpeter, Oslo Manual 2005 defines innovation as "the implementation of a new or significantly improved product (good or service), or process, a new marketing method, or a new organizational method in business practices, workplace organization or external relations" (OECD, 2005, p. 46). Accordingly, there are 04 types of innovation, namely: product innovation, process innovation, marketing innovation and organizational innovation. Innovation must satisfy two factors: (i) be new or have significant improvement to the enterprise (or to the market and to a higher extent) and must be implemented (within the enterprise or commercialization); and (ii) enhance the competitiveness of enterprises.

According to Oslo Manual 2018, the term "innovation" covers both activities and their outcomes. It must include the role of knowledge such as the innovation foundation, its novelty and usefulness, and value creation or retention. Accordingly, "Innovation as 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)" (OECD & Eurostat, 2018)[4]. Oslo Manual 2018 had reduced from four types of innovation (product innovation, process innovation, organizational innovation and marketing innovation) of the Oslo Manual 2005 to two main categories (product innovation and business manufacturing process innovation).

According to Cirera & Maloney (2017), innovation can be defined as "the ability to use knowledge to develop and apply new ideas to create changes in the production and organizational structure of an enterprise".

It can be said that the above innovation perspectives contain many capitalist ideas that affirm the importance of market economy, enterprises, marketing and commercialization. Meanwhile, in order to have systematic changes with practical value, innovation should stem from the needs of each institution, influenced by the regulatory, cultural and social framework that impact those institutions. Therefore, innovation is influenced

[3] Joseph Alois Schumpeter (1883-1950) was an Austrian American political economist and is considered by many Western scholars to be the most influential economist of the twentieth century. He was famous for the term "creative destruction", which refers to the "waves of innovation activities that affect the economy at various times leading to the destruction of the old economic structure and the creation of new economic structures". Schumpeter considered the introduction of, or the implementation of new combinations, as the main process of economic structural change (Hospers, 2005)

[4] The revised Oslo Manual 2018 from the 2005 version stem from: (i) the requirement to understand what issues need to be measured and to recognize which issues can be measured; (ii) the need to develop strong policy implications based on quantitative evidence on innovation. This version aims to improve and expand the innovation data.

by the value system, worldviews and concept of individuals and organizations wishing to make changes to their institutions.

In Viet Nam, the Law on Science and Technology 2013 defines: "Innovation is the creation and application of achievements, technical solutions, technology and management solutions to improve the efficiency of socio-economic development, productivity, quality and added value of products and goods".

Thus, the definitions of innovation show that innovation is a broad and multifaceted concept, involving many knowledge activities and levels of complexity. The connotation of the concept of innovation is that innovation includes *novelty* and *implemented* (introduction to the enterprise or commercialization) (Cirera et al., 2021) and creates changes (for example, creating added value, improving the competitive position of enterprises). Innovation includes not only the introduction of a "new or significantly improved" product, technology, business model, organizational structure or marketing strategy, but also efforts to test new products, processes or existing product, process, or experiment with alternative ways of doing things (Bell & Pavitt, 1993; Kline & Rosenberg, 1986). Innovation is considered as a "framework for change", leading to solutions that have a positive impact on trade, environment and society. Innovation is also understood as "associating" initiatives and inventions with specific impacts (Ha et al., 2020).

I.1.3. Innovation in the public sector

I.1.3.1. Differences between innovation in the public sector and the business sector

According to the Oslo Manual 2005 and later the Oslo Manual 2018, the definition of innovation is widely used when defining and analyzing innovation as well as in enterprise innovation surveys. However, this definition is not entirely suitable to define innovation in the public sector. Arundel et al. (2016) compared the relationship between innovation in the Oslo Manual with innovation in the public sector on several aspects (Table 1). The definition of innovation according to the Oslo Manual is moderately related to the definition of innovation in the public sector because the Oslo Manual does not include the innovation of concepts and policies– which are two components of innovation in the public sector. Similarly, innovation activities are also moderately relevant because some innovation activities in the Oslo Manual are rarely used in the public sector. The relevance is also moderate in terms of Innovation motivational factors and Innovation goals/outcomes; low in terms of Innovation expenditure and Innovation obstacles. Oslo Manual and innovation in the public sector are highly comparable in terms of Knowledge sources and Innovation collaboration, but additional detailed information in each aspect is needed for innovation in the public sector.

Table 1: The relationship between Oslo Manual and innovation in the public sector

Topics in the Oslo Manual	Comparability with the public sector	Explanation
Innovation Definition	Moderate	Innovation in the public sector includes conceptual innovation and policy innovation. These two types of innovation are not covered in the Oslo Manual.
Innovation Activities	Moderate	Some innovation activities in the Oslo Manual (R&D, external acquisition of intellectual and technical assets) are rarely used in the public sector, while others (training, equipment procurement) are often carried out in the public sector.

Innovation Expenditure	Low	It is difficult to collect data on innovation expenditure in the public sector because investments in public organizations are people-oriented.
Knowledge Source	High	High comparability, but innovation in the public sector needs more details about knowledge sources
Collaboration	High	High comparability, but innovation in the public sector needs more details about collaboration agencies
Motivational factors	Moderate	Motivational factors of enterprise innovation (profit and competitiveness) are rarely relevant to innovation in the public sector. The common point of innovation at enterprises and the public sector is taking user demand as the motivational factor for service innovation.
Objectives/Outcomes	Moderate	The public sector lacks a service revenue measure. The common point about innovation of the two regions is qualitative results such as quality, lower costs, and delivery speed (shorten time to perform public services).
Obstacles	Low	Common ground: insufficient resources. The public sector faces many internal obstacles (not mentioned in the Oslo Manual) such as employee resistance, enterprise culture that discourages innovation, afraids of risk.

Source: Arundel et al. (2016)

The difference between the public sector and the business sector lies in the goals of each region (OECD, 2014). The public sector operates according to **political logic** and conducts activities funded by the budget (taxes) to create public value politically defined or serve the needs of citizens. The main driver of innovation in the public sector is the non-profit diffusion of innovation, collaboration, political decision-making, employee initiative, and civic needs. According to OECD (2014), each innovation in the public sector aims to solve a public policy challenge and successful innovation achieves the desired public policy outcome as reflected in government decisions. Meanwhile, the business sector operates according to **market logic,** innovation serves to gain competitive advantages and profit generation.

Accordingly, innovation in the public sector is not the same as innovation in the private sector (OECD, 2018). Unlike the motivation of innovation rooted in the private sector, the innovation motivation in the public sector focuses on politics instead of profit. The public sector environment requires different approaches for innovation[5]. In terms of public sector, OECD (2018) discovered potential differences in environments/contexts with high and low rates of change and innovation and concludes that these differences did not necessarily increase public innovation, but public organizations needed to adapt and interact with new technologies, new ways of thinking, new working methods, and new relationships over

[5] For example, the skills to innovate and encourage innovation related to leadership in the public sector are clearly different from those in the private sector (Hall & Holt, 2008). Kattel et al. (2018) when reviewing the surveys on innovation in the public sector (such as MEPIN, EPSIS, NESTA, APSC...), the perception of innovation in the surveys was different (it is more difficult to distinguish between process innovation and product innovation, or explain whether it is innovation or not) in the public sector and thus, assumes a revised theoretical framework for innovation indexes and definitions for the public sector.

time, to evaluate whether they were still working. And innovation would be a contributing part of this process.

Hartley (2013, quoted in van Acker, 2017) assumes that another difference of innovation in two areas is the **publicity** of the innovation process and innovation in the public sector. Firstly, the needs, desires and interests of people as users of public services are different from those of consumers of products and services of enterprises. Secondly, public organizations often have to disseminate their innovation as much as possible so that the entire public sector can learn and make use of its benefits. In contrast, enterprises tend to captivate innovation results to themselves, in the form of patents and copyrights, to ensure a competitive advantage. Finally, the public sector incorporates a broader set of values than the private sector, such as transparency, equality, fairness, and legitimate democracy.

Regarding public innovation studies in the world, the authors observe two trends that are akin to the comment of Arundel & Hollanders (2011). The first trend assumes that many of the factors and strategies influencing how firms innovate will also apply to the public sector. The second trend assumes that there are clear differences in the ways innovation present in the public sector and therefore it is not possible to wholly apply the innovation model of the private sector to public institutions.

I.1.3.2. Definitions of innovation in the public sector

Up to now, there are a number of definitions of innovation in the public sector and in general, the definitions refer to “novelty”, “creativity”, “change” and “implementation”. Here are some typical definitions:

- According to European Commission (2011): “Innovation is a new or significantly improved service, communication method, process or organizational method.”
- According to European Commission (2013): “Innovation in the public sector can be defined as the process of generating new ideas and implementing those ideas to create value for society”. The Member States of the European Commission agreed that “innovation in the public sector is about new or improved processes (inward-oriented) or new or improved services (outward-oriented)”. Report of the European Commission (2013) also identified three common goals of innovation in the public sector as: (1) internally focused policies and initiatives to improve the effectiveness of the public sector; (2) externally focused policies and initiatives on improving services and outcomes for citizens and businesses; and (3) policies and initiatives focused on promoting innovation in other areas. Accordingly, there is innovation **in** the public sector (focusing on the inside or outside) and **through** the public sector (promoting innovation elsewhere).
- OECD (2016) defined: “Innovation in the public sector refers to significant improvements to administrative performance and/or public services. It can be defined as the implementation of a new or significantly improved process, method, or service by a public organization for the purpose of improving the entity’s operations or results in the public sector.”
- According to OECD (2017), in short, “ Innovation in public sector is the search for new ways to achieve public goals”.
- Mulgan & Albury (2003) defined innovation as “new ideas at work”, according to which “A successful innovation is the creation and implementation of new processes, products, services and methods of delivery resulted in significant improvements in performance, efficiency or output quality”. Similarly, Albury (2005) stated: “A successful innovation is the creation and implementation of new processes, products, services and delivery methods that lead to significant improvements in results and efficiency or quality.”

- According to Hollanders et al. (2013) in the EPSIS 2013 Pilot Report, innovation in the public sector can be defined as a process of generating and implementing new ideas to create value for society, including new or improved processes (internally) or new or improved services (externally).
- In the 2017 Danish Innovation Barometer survey, innovation was defined as a new or significantly changed way of improving performance and outcomes in the workplace. Innovation can be new or significant change in (i) services, (ii) products (intangible), (iii) processes or ways of organizing work, and (iv) methods of external communication.
- OECD Observatory of Public Sector Innovation (OPSI) listed 3 characteristics of public innovation, including: (1) Novelty: innovation introduce new approaches, related to the context in which innovation is introduced. (2) Implementation: Innovation must be implemented, not just an idea. (3) Impact: Innovation aim to achieve better public outcomes, including efficiency, efficiency and satisfaction of users and employees (OECD, 2014)[6].

When reviewing the measurement tools available in the world, the team found out that most of the research on innovation in the public sector and the tools for measuring innovation in the public sector are rooted from Western countries. This statement is in line with the review by Van der Wal & Demircioglu (2020) that there is insufficient research on innovation in the public sector in Asia although some Asian countries rank high on innovation in the public sector[7]. In understanding innovation, there are differences between Western and Eastern countries in terms of macro factors (political characteristics, governance quality, cultural values, demographic pressures, and willingness to invest for innovation) as well as the micro factors (Van der Wal & Demircioglu, 2020). The research team found out that innovation is a multi-dimensional, complex concept with many subjective implications and cannot be separated from the value system and specific characteristics of each society and culture.

Therefore, the research team proposes the definition as follows: "*Innovation*[8] *in the public sector is the implementation of new or significantly changed products, services, processes, and methods in order to achieve the desired goals of public organizations and lead to significant improvements in their results and activities*".

[6] European Commission (2013) reviewed previous studies and synthesized at least 4 values of innovation in the public sector: (1) Results: Better outcomes for individuals and society, such as increasing health, education, job creation, safety, environmental sustainability. (2) Services: Creating more meaningful, attractive and useful services for users (citizens, businesses). (3) Productivity: Improving internal efficiency of public organizations (4) Democracy: Enhancing citizen engagement and participation in a democratic manner; ensuring accountability, transparency and equality in society.

[7] For example, Singapore is one of the leading countries in e-Government (UNECE, 2017).

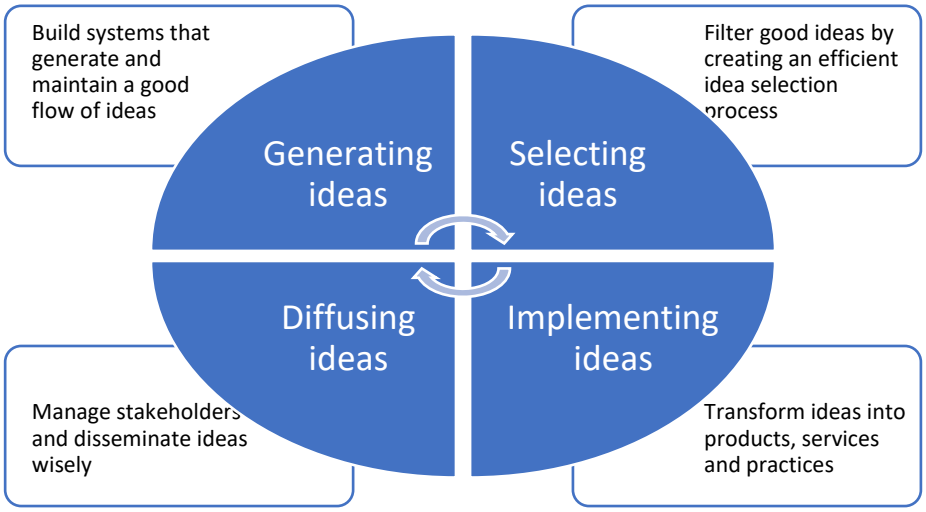
[8] According to the research team, innovation originates from the change, which is the most profound change in the thinking of each individual, leading to changes in individuals' actions and spreading to the organization (organizational culture).

I.1.3.3. Features of innovation in the public section [9]

OECD (2018) emphasizes innovation as a process[10,11], not an event. Innovation does not happen by accident, it depends on many conditions, capacities and supporting factors. Relevant factors include accumulated prior knowledge, infrastructure, investment, existing relationships and networks as well as innovation experience. Many international surveys also have an approach to innovation as a process[12]. According to The Innovation Unit (2009), innovation in an organization is a series of processes designed and managed for the generation and application of ideas and knowledge to create value, and new or changed products, policies, processes, technologies and business systems.

According to Kaur et al. (2022), not only is innovation in the public sector about outputs, but it is also a process that required management and support. In particular, innovation management allows administrative agencies in the public sector to have a vision and influence the process leading to results. Innovation can be considered under three layers: (i) Innovation as a result (actual innovation, which can include process, product, service or policy innovation), (ii) Innovation process (innovation journey from development to implementation), (iii) Innovation support (organizational measures to support innovation capacity and ability to use innovation to achieve results).

Figure 3: Innovation cycle according to Eggers & Singh (2009)



Source: Eggers & Singh (2009)

Innovation process was concretized by Eggers & Singh (2009) and includes 4 steps: Generating ideas, selecting ideas, implementing ideas (or converting ideas into products, services and practices), spreading ideas. Building on the four-stage approach of Eggers & Singh (2009), the Australian Government (2010) added

[9] The definitions and overview of innovation in the public sector cited in this report come from Western countries. As summarized by Van der Wal & Demircioglu (2020), most of the documents on innovation in the public sector originates from the US and Western European countries. While there is a lack of studies on Asia-Pacific, it is especially noteworthy when countries such as Australia, China, Japan, New Zealand, Korea, Singapore and Taiwan consistently rank high for innovation in the public sector. The research team has also tried to search, but the documents on innovation in the public sector of Asian countries is very limited and tends to favor typical cases instead of theoretical frameworks. For example, the research on innovation in the public sector of China by Wu & Ma (2013) used the concept of innovation by Walker (2008). That has limited the view of the research team on innovation in the public sector to suit the political characteristics and identity of Asian countries.

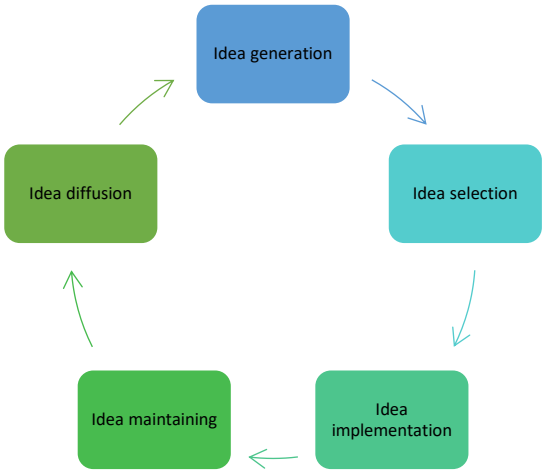
[10] Previously, Walker (2008) proposed to define "Innovation is a process through which new ideas, new objects and new practices are created, developed or reinvented and are new to the applying organization"..

[11] Meanwhile, Hartley (2008) considered innovation as both a process (the process of creating discontinuities in an organization or a service--innovating) and an outcome (as a result of those discontinuities— an innovation) (quoted in van Acker, 2017).

[12] Survey examples of NESTA and EPSIS.

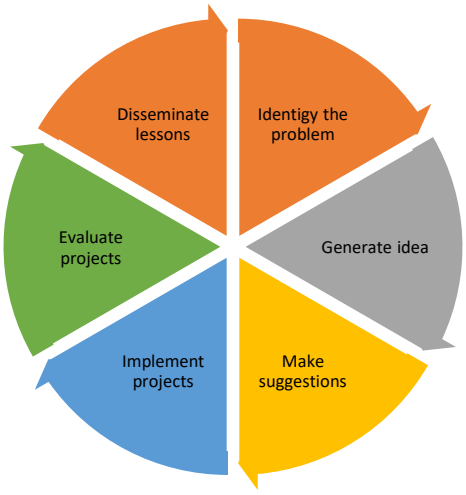
a “sustaining ideas” phase to emphasize the importance of sustaining innovation based on the fact the hat public sector, the unlike private sector, did not take profit as the dominant driving force and therefore, needs support and efforts to bring innovation into the public sector. In which, stage (1) Idea generation is searching, adjusting or creating ideas; (2) Idea selection is choosing ideas to use; (3) Idea implementation is putting ideas into practice; (4) Idea maintaining is continuing and integrating innovation initiatives, including monitoring and adjusting ideas as necessary; (5) Idea diffusion is sharing and spreading ideas/initiatives.

Figure 4: The 5-phase innovation cycle



Source: Australian Government (2010)

Figure 5: The innovation cycle



Source: OECD (2019)

OECD (2019) proposed an innovation cycle consisting of 6 steps: (1) Identify the problem: Find out where and how innovation is needed. This is not only related to existing or established problems, but also to emerging problems or to those that have not yet occurred. (2) Generate idea: Search and select ideas to solve the identified problems in step (1). An idea may reflect new knowledge and new technology, paving the way for new ways of acting, or it may reflect a new understanding of the current world. Without the ability to efficiently generate ideas, a team (or organization) will be limited to the possibilities they perceive and may miss out on the opportunities to find good alternatives. (3) Making suggestions: Involve finalizing ideas into options that can be evaluated and implemented. (4) Implement projects: realize the objectives of the selected proposal, navigate and handle arising problems. (5) Evaluate the project: find out whether the innovation initiative has achieved its goal and the reasons why it did or did not meet the goal. (6) Disseminate lessons: provide information about the lessons to other projects and see how innovation can be applied in other ways. OECD (2019, pp. 22–23) also considered these six steps in low-variable and variable environments. In addition, OECD (2019, p. 11) also analyzed the factors affecting innovation at 3 levels (individual, organization and system), including: reasons for innovation (factors promoting innovation intentions), innovation ability (factor affecting innovation ability), innovation capacity (essential element to carry out innovation efforts) and innovation experience (factor affecting innovation continuation).

Regarding the influence of Government functions on innovation capacity and motivation, OECD (2017) reviewed the impact on the following aspects: regulations, budgets, human resources, organizational innovation and risks.

Table 2: How do the government's functions affect innovation capability and motivation?

	Capacity for innovation	Motivation for innovation
Regulation	• Do rules, processes, and procedures hinder innovation? • Do hierarchies and bureaucratic conventions hinder innovation?	• Is it beneficial to accept challenges?
Budget	• Funding for piloting and replicating innovation • Flexibility in resource allocation	• What happens to innovation dividends? • How is innovation prioritized in budget allocation?
Human resources	• Perception • Autonomy (active) • Skill • Professional development and competence • Leader's Support	• Reward system in the organization? • Are innovation efforts systematically recognized? • Is innovation considered a criterion for career development?
Organizational innovation	• Testing space • Capital sources for innovation • Developing skills for innovation • Support in the use of techniques and new methodology	• Is innovation a recognized priority? • Is there a forum to share and record the success of innovation?
Risk	• Knowledge of risk and uncertainty management processes • Availability of necessary resources (skills and finance) for innovation	• How is innovation assessed (for example, is there a regulation to recognize innovation)?

Source: OECD (2017)

Due to its complexity, measuring innovation in the public sector remains difficult. The impact of successful innovation in the public sector is not immediately reflected in financial output, while the nature and diversity of public institutions and services make it extremely challenging to be measured (Hughes et al., 2011).

I.1.3.4. Factors of the innovation process in the public sector

The innovation process needs inputs for innovation and conducts internal innovation activities to create innovation outputs. According to MEPIN, innovation inputs include investment and financial support; training; innovation and staff management; strategy, management and capacity for innovation. Meanwhile, innovation management belongs to the pillar of innovation capacity in NESTA. Innovation inputs in APSII include investment, human resources, innovation resources, and technology infrastructure. The Korean Government's Innovation Index considers innovation inputs including research and development (R&D) results, strategic and consulting alliances, intangible assets, and information and communication technology (ICT) infrastructure, human resources.

In terms of human resources, innovation at the individual level is one of the three innovation levels mentioned in the OECD (2019). Therefore, human resources are a very important factor in innovation. In the

survey of LSEPPG 2008[13], APSC 2010[14] and EPSIS 2013, Human resources (shown in staff's skills, attitudes and related factors) is an important input of innovation (see more in Table 2.2. in Kattel et al., 2018). Besides the quality of human resources and people participating in innovation, training activities are also surveyed in PSII as in Innobarometer 2020 of the European Commission.

In terms of finance, forming a budget and resource allocation is a central process for every public sector organization, which is often tightly managed and followed by specific practices, policies and procedures. Although their impact on innovation capacity has not been fully studied, processes and rules for forming budgets may play a role in a number of ways. For example, budgeting policies can influence the sources of innovation finance available in government, as well as the incentives of organizational innovation by determining the reinvestment capacity to build innovation capacity and to support organizational priorities. They can also impact an organization's ability and/or willingness to share funds and/or savings across organizational boundaries in support of common goals. According to OECD (2017), the budget can encourage innovation through financial incentives, budget flexibility and a unified budget and investment framework so as to to scale up innovation, diffuse the benefits of innovation and promote measures to preserve investment capital.

In terms of policy for innovation, APSII shows that policy is an external factor affecting public sector innovation. Policy here includes not only legal documents but also processes and procedures regulating the operation of public organizations. According to OECD (2015), policies, processes and procedures can shape the innovation capacity of public organizations. Complicated and overlapping laws, rules and procedures governing the public sector's activities can hinder innovation[15]. Financial and human resources allocation policies can make it difficult or expensive for an organization to invest in innovation or share resources with others. Some fiscal consolidation measures can also reduce innovation capacity, even as countries strive to improve productivity and efficiency. Accordingly, allowing ministries or public organizations to allocate and use resources with a certain degree of flexibility is a way to support innovation.

Besides innovation inputs, in order to promote innovation in the public sector, the government needs public innovation capacity (Meijer, 2018). Public innovation capacity not only includes creativity and experimentation, but also requires the ability to connect and facilitate cooperation, the ability to exploit and discover, the ability to absorb new knowledge and constantly learn (Gieske et al., 2016). According to Kim & Kim (2022), innovation capacity includes the individual expertise and organizational resources to generate new resources for a forward-looking vision. An organization's innovation capacity is reflected in its individuals, structure, habits, culture, norms and information systems of an organization, and in the external relationships that enable that organization access to knowledge and other resources (IPAA, 2014). Kim & Kim (2022) divided innovation capacity in the public sector into 3 levels: individual, leader and organization. Their research assumed that innovation capacity at these levels interacted with each other and increased operational efficiency of the public sector. Individual innovation capacity is the ability of members of the organization to ensure expertise and perform tasks creatively. The innovation capacity of managers can be considered as the social capital of the organization, defined as the ability of managers to promote and create

[13] LSEPPG. 2008. "Innovation in Government Organizations, Public Sector Agencies and Public Service NGOs." Draft Working Paper. London: NESTA/LSE Public Policy Group

[14] APSC (Australian Public Service Commission), 2011. State of the Service Report: State of the Service Series 2010-2011. Commonwealth of Australia, Canberra.

[15] The Australian Government, when reviewing internal regulations, discovered: (i) The process of developing internal regulations is not consistent and systematic enough; (ii) Unclear or seemingly contradictory internal regulations confuse employees in public sector and they tend to interpret in conservative ways and apply complex processes that internal regulations not required by the ministry to avoid the risk of breaking the law (Australian Government, 2010).

cooperation in the organization through interaction with subordinates. Innovation capacity at the organizational level is considered as organizational capital, defined as the organizational structure or culture using human and material resources appropriately, managing human resources strategically and actively responding to changes in the external environment. Accordingly, the authors state "Innovation capacity is the professional expertise of members in the organization in providing high-quality services to citizens and the role of managers in using, maintaining and managing the people and resources of the organization".

In NESTA's survey, innovation capacity is the foundation for innovation activities. NESTA's innovation capacity consists of 3 groups of factors: Leadership[16] and culture of the organization, innovation management, and innovation-promoting factors of the organization. The NESTA survey asked questions about the leader's vision and spirit; innovation experience; leader's priorities in terms of developing new ideas or new ways of working; senior leaders' direction on the implementation of innovation in a dynamic and active way; leader's concern about the views of public officers and service users; and term thinking.

The role of leadership and innovation culture was mentioned in O'Donnell (2006): "A key challenge for the public sector is to develop a culture for innovation, moving from ad-hoc initiatives to a comprehensive innovation strategy, which is reinforced by funding agreements, by the leadership of senior management boards, and by rewards for managers who lead innovation and support employees during project implementation".

The leadership and culture of the organization belongs to the group of Innovation Process in the APSII 2011, and to the group of Environmental factors in the 2010 APSC. In APSII 2011, the organization's culture includes: prioritizing innovation; encourage innovation; autonomy in innovation; staff advocate for change and innovation; risk-taking and cooperative attitude. In the Innovation Barometer (Center for Offentlig Innovation, 2021), public organizations were also asked about these factors. The organizational culture indicators selected in PSII include the level of encouragement to discover, propose and implement new ideas; the level of encouragement of innovation activities; priority for innovation and the level of acceptance and willingness to change/innovation by public officials.

I.1.3.5. Types of innovation in the public sector

According to the summary of Cavalcante & Camões (2017), innovation in the public sector includes 3 types:

(i) Top-down innovation: Innovation is the result of decisions or the participation of politicians/officials/senior managers or motivated by superiors (authorization or direction);
(ii) Horizontal Innovation: Innovation is a process of co-creation between low and mid-level team/employees and leaders and;
(iii) Bottom-up innovation: innovation is carried out by direct employees/groups of employees without the participation of leaders.

Top-down innovation is often associated with broad policy directives and high-level ideas ("idea innovation"), while with bottom-up innovation, ideas originating from employees tend to be focused more operationally, leading to incremental improvements. Results from innovation surveys in international public organizations show that a large number of innovation in the public sector has a bottom-up form (Borins,2014). However,

[16] Borins (2002) studied the qualitative evidences on the relationship between leadership and innovation and found that in the innovation agency bottom-up form (proposed and implemented by subordinate staff) is more common and leaders play the role of creating an environment to support innovation, reward or recognize with innovation implementers, and promote innovators.

the roles of leaders and managers are particularly important in that they are influencing the desire to try new things (Kelman, 2008).

A review of the survey of innovation In the public sector in the world[17] shows that different surveys categorize the types of innovation in the public sector differently, but there are still common points in certain types of innovation.

Table 3: Types of innovation in the public sector through some surveys

Survey	**(Measuring Public Innovation in the Nordic Countries) MEPIN**	**Innobarometer, Innovation barometer**	**Australian Public Sector Innovation Indicators (APSII)**	**Dutch innovation barometer**	**China[18]**
Type of Innovation	Product/service innovation	Product innovation	Product/service innovation	Product innovation	Service innovation
	Process innovation	Service innovation	Process innovation	Service innovation	Process innovation (including: Technology and Management innovation)
	Organizational innovation	Process/work organization innovation	Innovation of communication methods	Process innovation	Collaboration innovation
	Innovation of communication methods	Innovation of communication methods	Policy innovation	Innovation of the interaction approaches	Governance innovation

Source: Compilation of the research team

Specific definitions for each type of innovation are outlined in the surveys as follows. MEPIN defines:

- Product or service innovation is the introduction of a new or significantly improved product or service compared to its characteristics or intended use, and includes significant improvements in customer accessibility, ease of use, engineering, specifications, or functionality to improve the quality of the product or service provided.
- Process innovation is the implementation of a new or significantly improved method of creating and delivering goods and services, and includes significant changes to methods, equipment, and/or skills intended to improve quality or reduce costs or delivery times.

[17] For details see the Appendix.

[18] According to a review of 80 innovation awards and excellent cases of local governance in China in the period 2001-2008 by Wu & Ma (2013).

- Organizational innovation is the implementation of a new method of organizing or managing work that is significantly different from existing methods, and includes new or significant improvements to the workplace organization or management system.
- Media innovation is the implementation of a new or significantly different method from existing communication methods to promote an organization or its services and goods, or new methods to influence to the behaviour of individuals or other objects.

APSII clearly classifies each type of innovation with its novelty (new or significantly changed) and implementation (one innovation has been carried out in the last 2 years) as follows:

- Product or service innovation includes: (i) Physical product or software; (ii) Service used by a public agency; (iii) A "common" service to share resources or reduce duplication between branches, departments or agencies; (iv) Services for people or businesses, including online services.
- Process innovation includes: (i) Process of providing products and services; (ii) Support activities (maintenance, procurement, accounting...); (iii) Methods of organizing work or making decisions; (iv) Knowledge and information collection, management and analysis systems; and (v) Education and training system for staff and management.
- Communication innovation includes: (i) Methods of promoting the organization or its services; (ii) Methods to influence the user's behaviour; (iii) Methods of consulting for users and stakeholders; (iv) Methods to promote innovation within the organization.
- Policy innovation includes: (i) Implementation of the Government's policy initiatives; (ii) Policy development undertaken by other Government entities and (iii) Develop a new or significantly altered strategy to meet the policy objectives of your department, agency or other government agencies.

For China, Wu & Ma (2013) consider 04 types of innovation taking into account the characteristics of the public sector.

- Service innovation: The public sector focuses on providing public services rather than products, so product innovation is not applied in the public sector. Public service innovation involves providing new services to new users, providing of existing services to new users, or providing new services to existing users, representing three types of service innovation: master, expansion and development (evolutionary).
- Process innovation includes technological innovation and management innovation, in which technological innovation, different from administrative/organizational/management innovation, involves a change in service delivery technology or arrangement. Technological process innovation is mainly concerned with the application of information technology.
- Management innovation is the restructuring of organizational structures, processes, and management practices. While technological process innovation is concerned with the application of new technology in the management system, management innovation is concerned with the novelty of operational processes, or the way services are provided. Examples of management innovation are the application of a total quality management system (TQM), results-based management, etc.
- Collaboration innovation is an activity that broaden boundaries in service delivery and management (e.g., alliances, partnerships, collaborations, and networking).
- Governance innovations are new approaches and practices for managing democratic institutions, activating citizen participation and fighting corruption. Governance innovation is more political in

nature and multi-purposed than the above types of innovation, and it is increasingly becoming a prerequisite for far-reaching administrative reform. Governance innovation is now prevalent in developing countries and economies in transition due to the changing nature of political systems. The intertwined political-administrative relationship in China has led to broad governance innovations, such as grassroots democracy, greater openness and transparency, decentralization and empowerment, marketization, outsourcing, e-Government, etc.

The overlap between classification of innovation according to surveys and research lies in the difference between product and service innovation (which can be divided into two categories), process innovation, and communication innovation.

I.2. Innovation policies in Viet Nam

I.2.1. Innovation policies and Legal documents relating to innovation

Research on development history, practical lessons related to innovation of countries in the world and Viet Nam reveals that the Government plays a significant role in initiating, orienting, regulating and synergistically connecting resources to bring about fundamental and far-reaching changes, especially in times of crisis and upheavals. The government can launch programs to innovate infrastructure and create a learning environment for implementing innovation nationwide; comprehensively top-down influence or secure funding to enhance the holistic mindset and capacity of the workforce to adapt to scientific and technical change profoundly and quickly.

The resolution at the 13th Party Congress set a specific goal related to innovation. Specifically, by 2025, Viet Nam "is a developing country with modern industry, surpassing the low middle-income level"; by 2030, "is a developing country with modern industry and high middle income"; and by 2045, "becomes a developed, high-income country".

The resolution at the 13th Party Congress emphasized that in order to achieve the vision of 2045, Viet Nam must promote the research, transfer and application of scientific and technological advances, and innovation. Particularly, the achievements in the fourth industrial revolution must not exclude the implementation of national digital transformation, the development of the digital economy, the improvement of productivity, quality, efficiency and competitiveness of the economy. To achieve the vision from 2035 to 2045, Viet Nam must transit to an innovation-based economy. An innovation-led economy must be accompanied by the support of sweeping and comprehensive reforms in the legal and policy environment.

Viet Nam is in the transition from a labour/resource-based economy to one based on labour productivity, industrialization and modernization. Therefore, Viet Nam should give priority to perfecting the practical and scientific basis for innovation by 2025 – systematizing the policy system on innovation; adjust, complete and supplement existing laws, decrees, schemes and programs related to innovation. After having a theoretical and practical basis on a more comprehensive and systematic scale, Viet Nam can begin to reposition and determine if it is necessary to enact a law on innovation in the period 2025 - 2030 to contribute to realizing the goal of moving towards an economy led by innovation, achieving the vision of a high-income country by 2045.

Figure 6: Current unsystematic and incomprehensive policies of promoting innovation in Viet Nam

Practices from many countries show that innovation needs to be approached comprehensively with different components: (i) education and training, human resources; (ii) infrastructure; (iii) finance; (iv) research and development, science and technology; (v) commercialization of inventions and technology transfer; and (vi) connectivity, cooperation and communication. Current innovation promotion policies are biased towards innovation start-ups and science and technology; while innovation is a broad category and covers aspects of education, finance, infrastructure, culture, etc. In order to promote innovation, it is necessary to have a comprehensive and inclusive innovation policy system, associated with the strategy and goals of 2030 and the vision of 2045. In fact, Viet Nam's innovation policy system is also dispersed and separated in different ministries, branches and fields; there is no comprehensiveness at the national level with a common vision of innovation.

I.2.2. Innovation policies in the public sector

As analyzed above, Viet Nam **does not have a specific and specialized regulation and policy for innovation in the public sector**. The reason is that neither the definition of "innovation" has been detailed in the legal document system, nor has it been assigned to a government agency to directly lead the innovation work. However, the documents and policies of the Party and Government agencies have also integrated and included the "innovation" into the documents of the sectors and fields under their management and implementation. Important strategies and plans of the Party and Government all mention innovation as a driving force for the development of the digital economy, digital society, and digital transformation in government agencies. Among them, the following major policies stand out:

- Decision No. 749/QD-TTg dated June 3, 2020 approving the "National digital transformation program to 2025, orientation to 2030"
- Decision No. 2889/QD-TTg dated December 31, 2020 on the National Strategy for the Fourth Industrial Revolution to 2030
- Decision No. 569/QD-TTg dated May 11, 2022 of the Prime Minister promulgating the Strategy for Science, Technology and Innovation Development to 2030

- Decision No. 411/QD-TTg of the Prime Minister: Approving the National Strategy to develop the digital economy and digital society to 2025, with orientation to 2030.

Table 4: Innovation related policies

Policy	Objectives and guidelines related to innovation
Decision No. 749/QD-TTg	*The National Digital Transformation Program 2021 – 2025 addresses the goals of institutional creation, and digital infrastructure development to encourage innovation:* "2. Institution construction Construct institutions in the direction of encouraging and willingly accepting products, solutions, services, digital business models, and promoting new management methods for newly arising relationships, including: a) Accepting to test products, solutions, services, and digital business models while the legal regulations are incomplete and unclear, in parallel with the completion of the legal corridor. Building a controlled trial legal framework for the development, testing and applying digital products, solutions, services and business models in Viet Nam, clearly defining the scope of space and time experiment, *to encourage innovation*; b) Reviewing, proposing amendments and supplements to the system of legal documents in specialized fields to meet the requirements of adjusting new relationships arising in the digital transformation process, *encouraging innovation*; c) Reviewing, proposing amendments and supplements to the system of legal documents on enterprises, innovative start-ups, intellectual property, trade, investment and business to create favorable conditions for the national digital transformation process and develop new products, services and business models based on digital technology, Internet and cyberspace"
Decision No. 2889/QD-TTg	The National Strategy on the Fourth Industrial Revolution to 2030 addresses innovation in the following general objectives: "Proactively take advantage of the Fourth Industrial Revolution; basically master and widely apply new technologies in socio-economic fields; step by step create new technologies in order to promote the renewal of the growth model, restructure the economy in association with implemented strategic breakthroughs and modernize the country; strongly develop the digital economy; *fast and sustainable development based on science and technology, innovation and high-quality human resources*; improve the quality of life, welfare and health of the people; firmly ensure national defense, security and protection of the ecological environment; improve the efficiency of international integration and closely link the application of the Fourth Industrial Revolution with the protection of network security."
Decision No. 411/QD-TTg	*The National Strategy for Development of the Digital Economy and Society to 2025, with a Vision to 2030, focuses on digital policy and environment combined with innovation to achieve the goal of digital economic development:*

Policy	Objectives and guidelines related to innovation
	"Digital economy is an economic activity that uses digital technology and digital data as main inputs, uses the digital environment as the main operating space, and uses information and telecommunications technology to increase productivity. employees, *innovate business models and optimize the economic structure*."
Decision No. 569/QD-TTg	*Decision 569/2022 is the latest document issued related to innovation in general and innovation in the public sector in particular. Specifically, the goals of innovation are associated with the goals of science and technology. Specifically:* "By 2030, science, technology and innovation will be firmly developed, truly becoming a driving force for growth, making a decisive contribution to turning Viet Nam into a developing country with modern industry, high income and average high entry; contributing to the comprehensive development of culture, society and people, ensuring national defense and security, environmental protection and sustainable development, enhancing Viet Nam's international position and prestige; *scientific, technological and innovative potentials and levels of innovation have reached advanced levels in many important fields, belonging to the leading group among high-middle-income countries; the level and capacity of technology and innovation of enterprises are above the world average; some fields of science and technology reach the international level."* For specific goals, the targets focus on quantitative indicators with technology products, total investment spending, increasing contribution to GDP of science and technology, innovation, improving high in the Global innovation index (GII), human resource development, science and technology system, and innovation.

Source: Compilation of the research team

Thus, it can be seen that the Party and Government have been very interested in setting goals, orientations as well as solutions to develop innovation in Viet Nam in the period of 2021-2025. However, these goals and strategies are being integrated with other national programs and strategies, but there is no legal document or strategy dedicated to innovation, both in the private sector and in the public sector. Therefore, in the coming time, Government agencies need to pay attention to, orient and create institutions and plans to create driving force for innovation in Viet Nam.

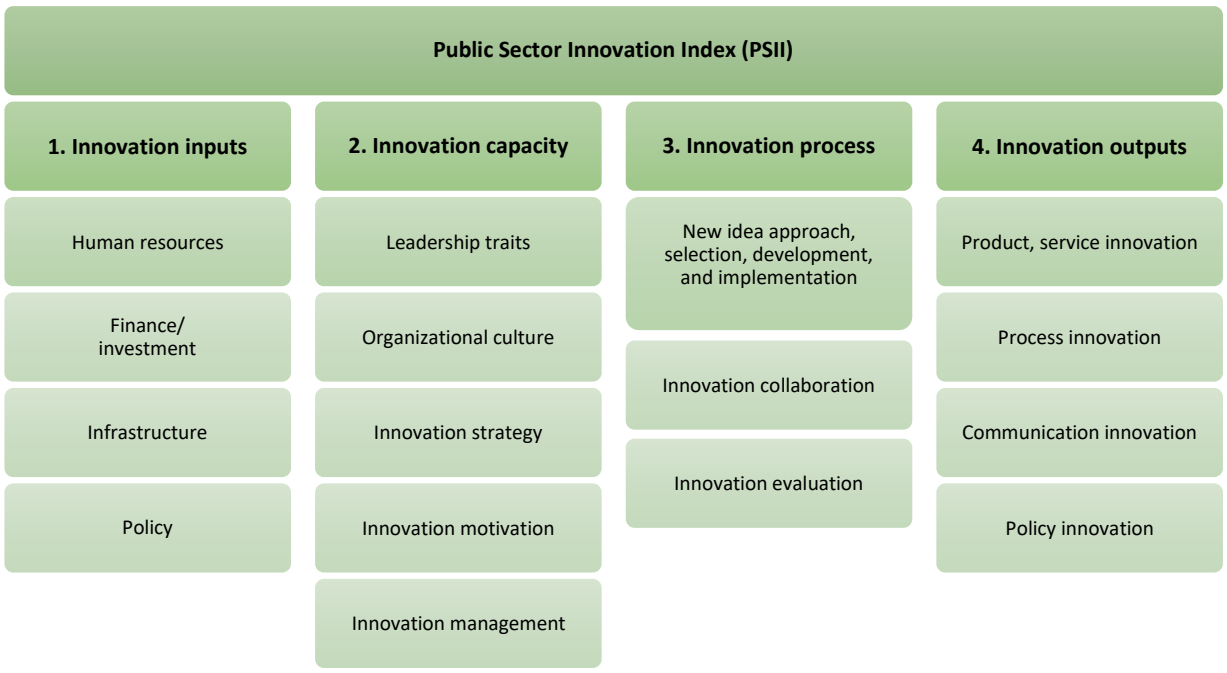
II. RESEARCH METHODOLOGY FOR DEVELOPING A CRITERIAL FRAMEWORK FOR MEASURING INNOVATION IN THE PUBLIC SECTOR

The innovation index in the public sector is built based on the approach of innovation as a process, which refers to the 6-step process of OECD (2019). If we consider innovation as a process, it will include inputs and outputs. Innovation inputs are not enough to create outputs without innovation capacity to put inputs to use and turn ideas into changes (innovation results). To reflect the three characteristics of innovation in public sector (novelty, implementation, impact), innovation output includes not only the types of innovation introduced by the organization, but also the types of innovation that have been implemented and their results. In addition, the novelty of innovation (first introduced, learned and modified from innovation results of other organizations, using innovation results of other organizations) should be acknowledged.

From the definition of innovation in the public sector: "*Innovation in the public sector is the implementation of new or significantly changed products, services, processes, and methods in order to achieve the desired*

goals of public organizations and lead to significant improvements in their results and activities" and international experiences[19], the research team proposes a criteria framework for measuring innovation in the public sector for Viet Nam including four pillars, namely: (i) Innovation inputs, (ii) Innovation capacity, (iii) Innovation process and (iv) innovation outputs. Each pillar consists of the component indicators depicted in Figure 6.

Figure 7: Innovation conceptual framework in the public sector for Viet Nam



Source: Propose of the research team

II.1. Component 1: Innovation Inputs

This component includes indicators regarding human resources, finance/investment, infrastructure and policy. In which, the first three component indicators are the necessary inputs to implement innovation activities and the last component indicator is the factor affecting innovation.

(i) Human resources for innovation:

Public administrative human resources in our country include groups of cadres, civil officers and public employees according to the Law on Cadres and Civil Servants in 2008, the Law on Public Employees in 2010, and the Law amending and supplementing a number of articles of the Law on Cadres and Public Officials 2018 and Law on Public Employees 2010. According to a report of the Ministry of Home Affairs, the number of civil officers from district level and above is 323,349 people; the total number of cadres and civil officers at commune level as of 2014 is 235,384 people; public employees working in public units is 1,834,111 people[20].

[19] Due to the lack of legal basis and not many options for international lessons, the team studied the available measurement tools of OECD countries, Australia, Northern Europe and China to experiment with developing a bechmark framework for measuring innovation in the public sector for Viet Nam. That is also a limitation of the research. More in-depth studies are needed to clarify the similarities and differences in the world's concept of innovation (which should include more full assessment and comparison of ideologies) in general and Viet Nam in particular to build an assessment framework suitable to the specific culture of Viet Nam.

[20] Source : https://taichinhdoanhnghiep.net.vn/phat-trien-nguon-nhan-luc-dap-ung-yeu-cau-doi-moi-sang-tao-dam-nghi-dam-lam-d25816.html

However, as pointed out in Resolution No. 26-NQ/TW dated May 19, 2018 of the 17th Plenum of the Party Central Committee, term XII, a number of public officers in administrative agencies and public units have not meet requirements and tasks[21].

Human resources for innovation refer to the percentage of units whose people are assigned to propose and implement innovation; the proportion of human resources that can meet the proposal and implementation of innovation; assess the capacity of public officials and cadres on the aspects of innovation project management, learning new ideas and methods, implementing new experiments, dare to think, dare to implement...; and train in proposing and implementing innovation for public officials. Human resources for innovation were mentioned in MEPIN 2010, Innobarometer 2010, APSII 2011, EPSIS 2013, Korean Government Innovation Index.

(ii) Finance/investment for innovation: Forming budget and resource allocation can affect the innovation capacity of public institutions in a number of ways. Budgeting policies can (i) affect the financial resources available for innovation; (ii) influence the incentives for innovation in terms of reinvestment capacity to build the innovation capacity; and (iii) impact on organizations' ability and/or willingness to share funds and/or savings.

(iii) Infrastructure for innovation: ICT infrastructure is an important input for innovation. According to Article 4 of the Law on Information Technology 2006, this infrastructure includes a system of equipment for the production, transmission, collection, processing, storage and exchange of digital information, including telecommunications networks, the Internet, computer networks, and databases. This is also the criterion reviewed in the MEPIN and EPSIS 2013 surveys, while technology infrastructure is an important input in the 2010 APSC survey.

(iv) Policy for innovation: As analyzed in section I.2, Viet Nam's policy system has not yet created the overall strength to promote innovation comprehensively and effectively. Policies are dispersed in different respects and are run by different ministries, departments and sectors. Policies to promote innovation are still biased towards innovation start-up and science and technology, while innovation is a broad category and covers aspects of education, finance, infrastructure, culture and tourism.

II.2. Component 2: Innovation capacity in the public sector

Innovation capacity in the public sector is measured under five aspects: (i) leadership traits; (ii) organizational culture; (iii) innovation strategy; (iv) innovation motivation; and (v) innovation management. In which, aspects (i), (ii), (iv) and (v) were mentioned in NESTA 2010. Aspects (i) and (ii) were mentioned in APSC 2010, APSII 2011 and Innovation Barometer.

(i) Leadership traits: This section not only questions about the personal characteristics of the leader (experience in participating in innovation activities) but also asks about actively directing, facilitating and supporting innovation activities of the unit. Leadership traits were covered in NESTA 2010, APSC 2010, APSII 2011, EPSIS 213 and Innovation Barometer.

(ii) Organizational culture: Organizational culture examines factors that promote or hinder the change/innovation of the unit, such as individuals accepting and willing to change/innovation, priority, and encouraging innovation in the unit. Organizational culture was covered in NESTA 2010, APSC 2010, APSII 2011, EPSIS 213 and Innovation Barometer.

[21] Resolution No. 26-NQ/TW stated: "... in general, the number of officers is large but not strong; both redundancy and shortage of cadres occurs in many places; the linkage between levels and sectors is still limited. …. The capacity of the officers is not uniform, the presence is still limited and weak."

(ii) Innovation strategy: Normally, a unit with an innovation strategy (especially a long-term strategy, from 5 years or more) will accompany plans for strategic implementation and integration into its operations. The innovation strategy is mentioned in Innobarometer 2010.

(iv) Innovation motivation: Motivation to carry out innovation activities can come from individual cadres and public officials (due to curiosity, eagerness to learn, and thirst to improve work efficiency) or from incentives of the unit. Innovation motivation was mentioned in NESTA 2010, APSII 2011.

(v) Innovation management: Innovation management is considered in terms of risk management related to innovation and innovation to improve efficiency and effectiveness. Innovation management was mentioned in NESTA 2010, APSII 2011 and Dubai government's Innovation Framework.

II.3. Component 3: Innovation process in the public sector

Learning from the OECD (2019), APSII 2011 survey, Innovation Barometer 2017 of Denmark, and the Innovation Barometer 2021 (Center for Offentlig Innovation, 2021), the innovation process includes six stages, namely: approach, slection, development and implementation new of ideas; innovation collaboration; innovation assessment; and innovation diffusion.

(i) Approach, selection, development and implementation of new ideas: The component index Approach, selection, development and implementation of new ideas refers to the first four stages of the 6-step innovation cycle. This index refers to the unit that has a system to evaluate and develop ideas of cadres and public officials; information sources that affect the innovation activities of the unit; important sources of ideas that have great influence on the innovation of the unit; financial resources for selection, development and implementation of innovation ideas. Approaching, selecting, developing and implementing of new ideas are covered in NESTA 2010.

(ii) Innovation collaboration: Innovation collaboration was mentioned in APSII 2011, Innovation Barometer 2017 of Denmark and Innovation Barometer 2021. Innovation collaboration considers collaboration with other units in the process of innovation implementation; collaboration units; and the level of innovation collaboration inside and outside the unit.

(iii) Innovation diffusion: Innovation diffusion was mentioned in NESTA 2010, APSII 2011, Innovation Barometer 2017 of Denmark and Innovation Barometer 2021. The innovation diffusion component index considers the units that have disseminated/shared innovation results of their own units so that other places can learn and channels to spread innovation results.

(iv) Innovation assessment: The assessment of innovation is mentioned in the Innovation Barometer 2017 of Denmark and in the Innovation Barometer 2021. This component index examines whether the entity evaluates the innovation results or has a plan to evaluate but has not yet implemented, and how to evaluate the results of innovation.

II.4. Component 4: Innovation outputs in the public sector

PSII includes 4 types of innovation like APSII, including product/service innovation, process innovation, communication method innovation and policy innovation. Because the characteristics of innovation are novelty and implementation, each type of innovation will be investigated based on innovation introduced in the last two years, innovation implemented in the last two years, and the novelty of the latest innovation. Details are as follows:

(i) Product or service innovation: This component index looks into new or significant changes in products or services that the entity has made in the past two years (e.g. internal software at the unit), "public" services

to share resources or reduce duplication between branches, departments or units, public services, including online public services); the novelty of the latest product or service innovation; and evaluate the impact of the implementation of the innovation of that product or service (e.g. increase transparency, shorten service delivery time, increase service volume, increase the satisfaction level of users).

(ii) Process innovation: This component index explores new or significantly improved processes in the past two years (including product and service delivery processes, support activities, work organization or decision-making methods, knowledge and information collection, management and analysis systems, and education and training system); the novelty of the latest process innovation; and the impact of the implementation of process innovation (e.g.: simplifying administrative procedures, increasing work processing speed, increasing work processing efficiency, saving costs).

(ii) Communication innovation: This component index considers new or significantly changed methods of communication that the entity has implemented in the past 2 years (e.g., methods of promoting the organization or its services; methods of consulting, guiding for users and stakeholders; methods of promoting innovation within the unit); the novelty of the closest communication method innovation; and the impact of the implementation of innovative communication methods (such as raising people's awareness, increasing the percentage of users, or people/enterprises knowing about the public services provided by the unit).

(iv) Policy innovation: This component index studies new or significantly-changed policies that the entity has implemented in the past two years (e.g., implementation of Government policy initiatives, new construction or significant modification of policies to meet the policy objectives of its department, unit or other government entities); novelty of the latest policy innovation; and the impact of policy innovation (e.g. serving the implementation of the Government's guidelines and policies; serving the implementation of interdisciplinary policies and strategies, involving many units).

III. PILOT SURVEY RESULTS

III.1. Pilot survey results to develop a criterial framework for measuring innovation in the public sector (PSII)

After building a criterial framework for measuring innovation in the public sector (temporary criteria framework) based on international experience and legal basis, the research team carried out a pilot survey to evaluate innovation activities in Viet Nam's public sector to (1) Collect basic information on the innovation situation of ministerial-level agencies and provincial-level People's Committees, influencing factors, innovation process and results; (2) Assess the reasonableness and feasibility of the Information Collection Form and the Criterial framework; finalize the Information Collection Form and the Criterial Framework; and (3) Withdraw lessons learned for the next steps.

The ministerial-level surveying unit is the Ministry of Planning and Investment, including the Vietnam National Innovation Center, the Foreign Investment Agency, the Business Registration Agency and the Public Procurement Agency. The provincial-level surveying units include the Department of Planning and Investment of Quang Ninh province, the Department of Planning and Investment of Ninh Thuan province, and the Department of Home Affairs of Dak Lak province.

A. The survey was conducted in the form of online and paper questionnaires. Respondents are required to declare information about working units and positions, serving the process of classification and analysis of results. The survey form to collect information for innovation indicators in the public sector has been built and is arranged in a circuit to save time and not distract the respondents. The survey includes the following items: Information about respondents;

B. Factors affecting innovation activities at the unit, including factors such as labor; infrastructure; policies, processes and procedures; finance/budget; policies for innovation; and innovation culture;

C. Innovation implementation at the unit, including approaching, selecting, developing, and implementing new ideas/solutions; Innovation cooperation; and,

D. Results of innovation activities, including Product and service innovation; Process innovation; Innovating communication methods; and Policy Innovation. Each of these types of innovation has questions about classification, novelty, and innovation results.

This pilot survey has some limitations, which are (i) The preparation time is short, so the number of units contacted for the survey is small (total 7 units at the ministerial and provincial level), the number of respondents is quite few (37 valid submissions out of 41 answers) because there is no legal basis to force the units to conduct the survey. In addition, due to the lack of training time for survey units, respondents may not understand some of the questions well (although the research team has tried to translate foreign terms). (ii) Some questions have very few answers, probably due to the fact that the respondents do not understand the questions well or because the software lacks some features (such as the temporary storage feature, for example) so the answer 'No' is saved when the respondent stops responding temporarily.

III.2. Pilot survey results

III.2.1. Information about survey respondents

The pilot survey was conducted from November 20, 2022 to December 5, 2022 and received a total of 41 responses, of which 37 were valid (including 22 from 3 units under the Ministry of Planning and Investment and 15 from 3 provincial-level agencies). Respondents are leaders at all levels, accounting for about 22.3% at the ministerial level and 33.3% at the provincial level. Cadres, civil officials, and public employees directly involved in innovation activities accounted for 40.9% of the ministerial-level sample and 46.7% of the provincial-level sample; the rest are civil servants in the unit.

Figure 8: Structure of respondents in ministerial-level agencies by position (%)

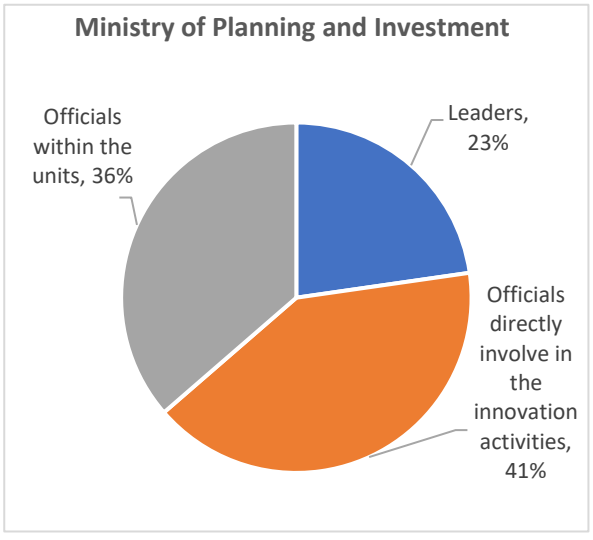
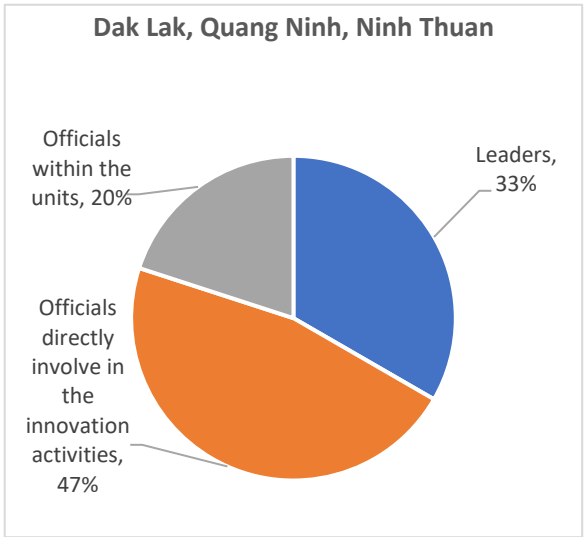


Figure 9: Structure of respondents in provincial-level agencies by position (%)



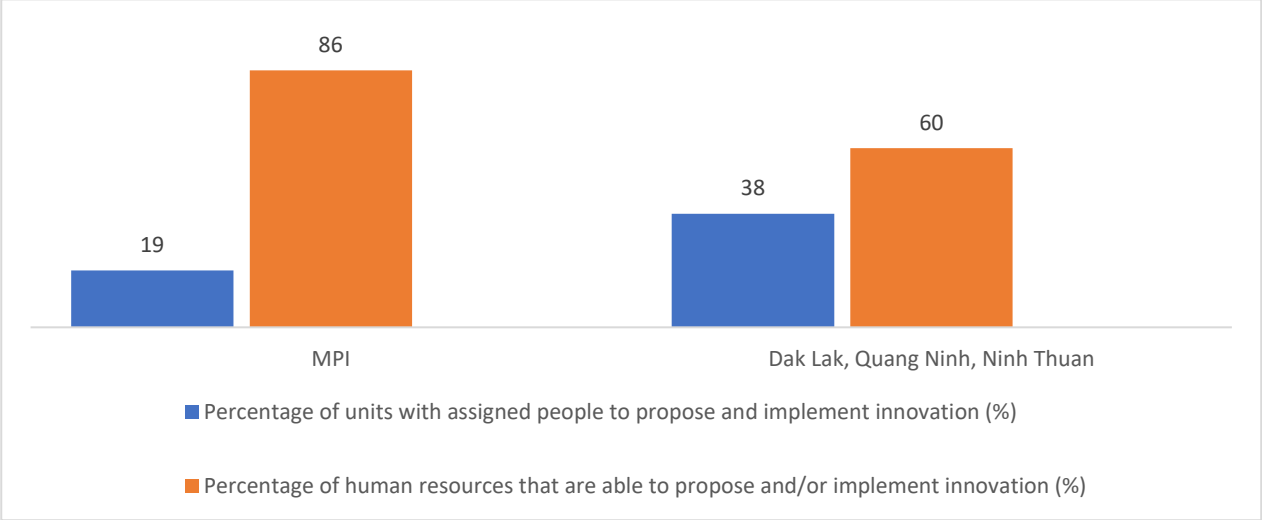
III.2.2. Component 1: Innovation inputs in the public sector

As mentioned in section I.1, innovation inputs include four groups of factors, namely people, finance/investment, infrastructure and policy.

III.2.2.1. Human resources for innovation

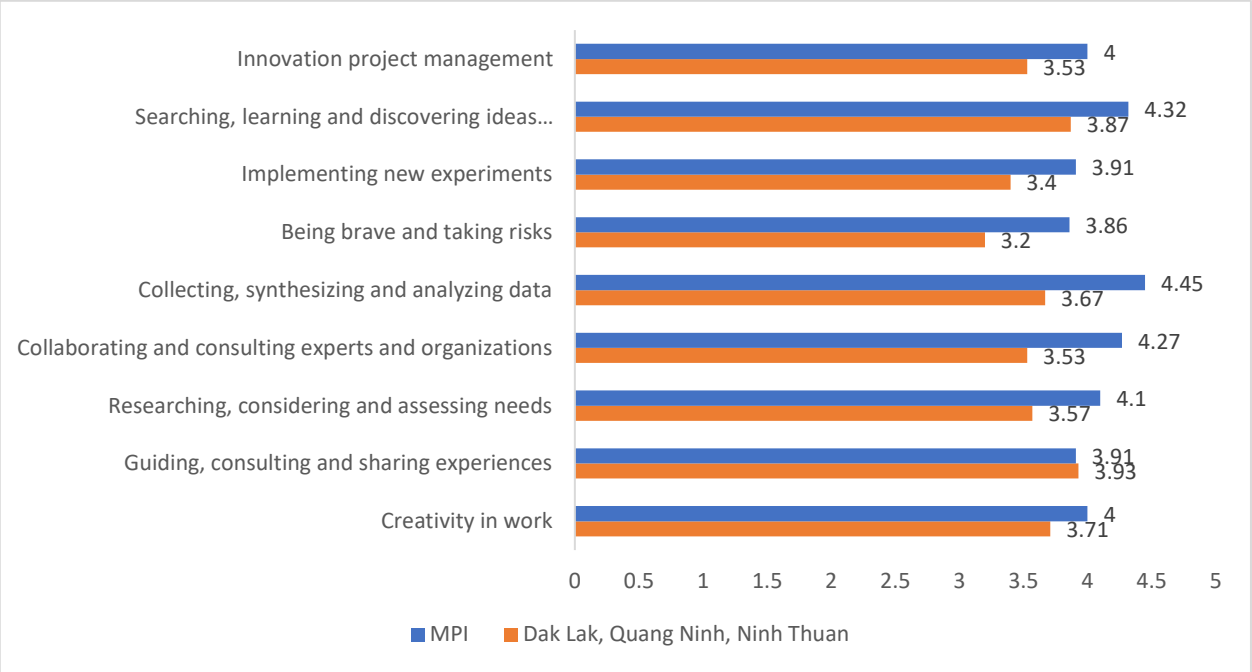
The units were asked about the percentage of assigned people within the units to propose and implement innovation in order to find out about their innovation activities. Overall, only 18.8% of the respondents in the Ministry of Planning and Investment (MPI) and 37.5% of the respondents in the 3 provinces said that the unit has assigned public officers to propose innovation. Although the percentage of units with people participating in innovation activities is quite low, most of the respondents highly appreciate the human resources in the unit, who are capable of proposing and/or implementing innovation. While informants in MPI are quite confident about the level of human resources in their units (about 86.4% of human resources are capable of implementing innovation), informants in provincial departments are still lacking confidence in the capacity of civil servants in their units with the rate of about 60% saying that human resources at provincial agencies meet the requirements of innovation. The reasons why provincial public officials have not met the requirements of proposing and/or implementing innovation are (i) Lacking human resources to participate in innovation development and implementation (3/4 answers) and (ii) Lacking capacity to convert new ideas into innovation and/or implement innovation activities (1/4 answers).

Figure 10: Percentage of public servants implementing innovation and the proportion being capable to propose and/or implement innovation (%)



take Respondents were asked to **self-evaluate** the capacity of public officials and employees of their organization/unit on a scale of 1 to 5 (1= Weak; 2=Medium; 3=Good; 4= Pretty good; 5=Excellent) for each skill and ability. Highest GPA for data collection, synthesis and analysis (4.45); followed by exploring, learning and discovering new ideas (4,32) and collaborating, consulting experts and organizations (4,27). However, public servants in MPI and the three provinces are still not ready to risks or conduct new trials. Creativity in work and innovative project management skills are what civil officers need to further cultivate.

Figure 11: Average score of capacity assessment of public servants (% of respondents)

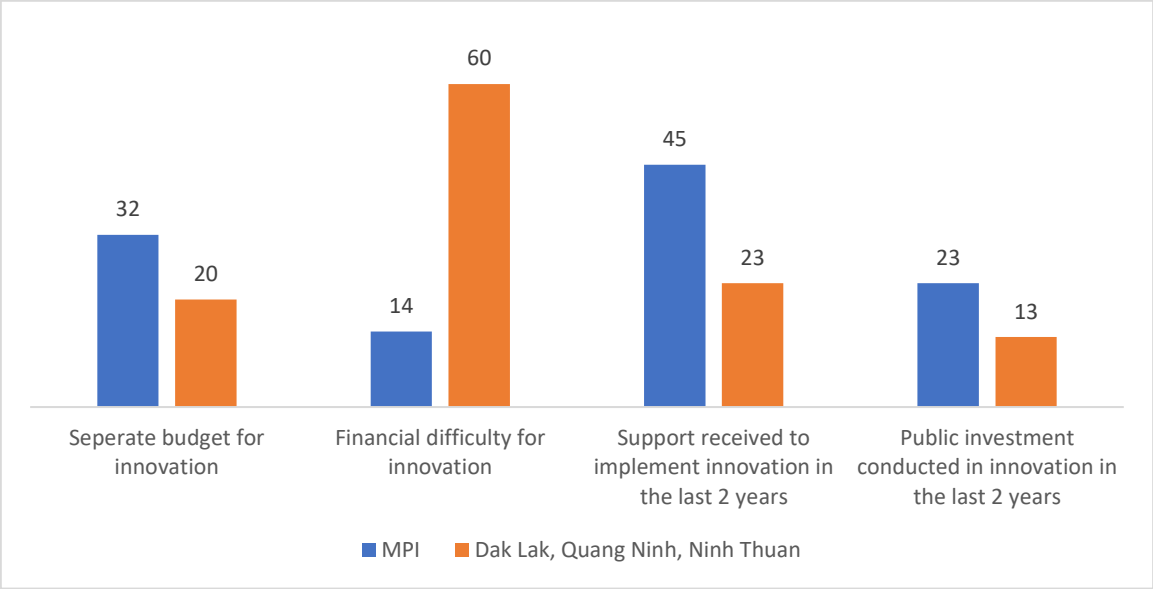


III.2.2.2. Finance/ investment for innovation

Finance is an important resource for innovation activities. In general, investment in science and technology is still limited and has not reached its target. The total social investment in science and technology increased from 0.19% of GDP in 2011 to 0.53% of GDP, but it has not yet reached the target of 2.0% of GDP in 2020 and is lower than the world average of 2.23%. Viet Nam is lagging behind in terms of technology readiness, innovation, and labor productivity compared to some Asian countries such as China, India, Singapore, Malaysia and Thailand.

When asked if the unit has its own budget for innovation, 31.8% of respondents in MPI and only 20.0% of respondents in units in the three provinces said that their units have a budget for Innovation. Compared with other units in MPI, provincial units face financial difficulties for innovation activities. About 60% of respondents in the three provinces responded that their organization's innovation finance was very limited, but only 23.1% received support for innovation implementation in the last 2 years. In contrast, only 13.6% of respondents in MPI claimed that there were financial difficulties for innovation, but 45.5% received financial support for innovation. With a high percentage of units facing financial difficulties for innovation while receiving little support, only 13.3% of units in the three provinces of Dak Lak, Quang Ninh, and Ninh Thuan made public investments for innovation in the past two years, only half the rate of 22.7% of MPI.

Figure 12: Finance for innovation (% of respondents)



II.2.2.3. Infrastructure for innovation

When asked about the availability of IT machinery and equipment for innovation activities, 45.5% of informants at the MPI agreed that their units have machinery and equipment available for innovation, while only 26.7% of civil servants in the three provinces agree. In contrast, more than 50% of provincial officials and public officers partially agree and only 36.4% of MPI officials have similar opinions. It is noteworthy that there are still about 13% of opinions at both levels disagreeing that IT machinery and equipment are available for innovation activities. Out of these five disagreements, three are departmental leaders (in both MPI and the three provinces), showing that the facilities of some units at both levels are not enough to meet innovation activities.

Figure 13: Availability of IT machinery and equipment for innovation activities (% of respondents)

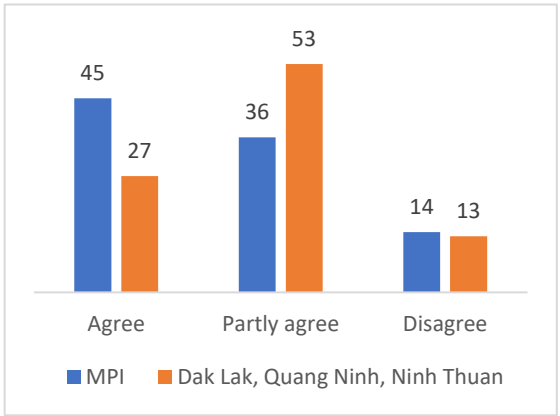
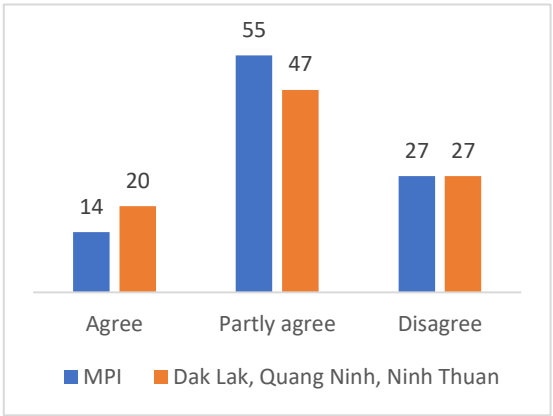


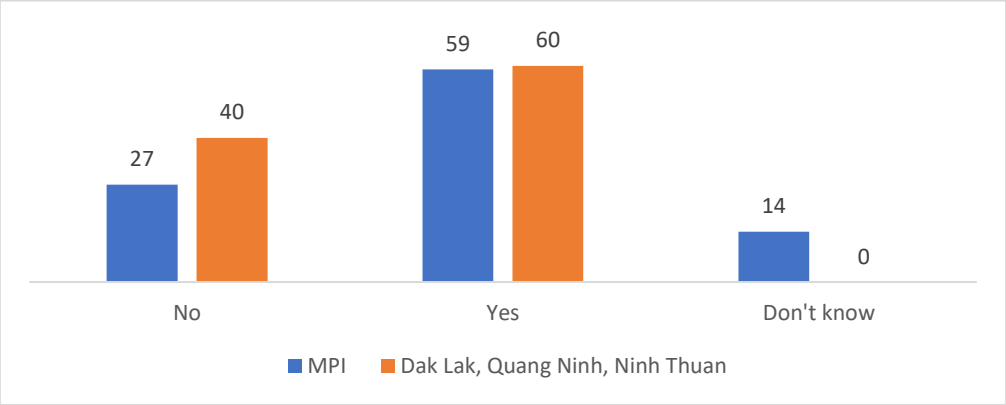
Figure 14: Advanced IT machinery and equipment for innovation (% of respondents)



Following the question about the availability of IT machinery and equipment, the respondents were asked about the level of advancement of IT machinery and equipment for innovation. Only 13.6% of informants surveyed at MPI and 20% of informants surveyed in the three provinces agreed that machinery and equipment are advanced; up to 27.0% of respondents disagreed that IT machinery and equipment for

innovation are at an advanced level. Thus, some units under MPI and the three departments of the three provinces lacking IT machinery and equipment for innovation, and a certain percentage of existing machines is not yet advanced. The implication is that to promote innovation activities in public agencies, it is essential to invest in and equip modern machinery and equipment, especially in units with tremendous opportunities and pressures to innovate.

Figure 15: Percentage of units with technology infrastructure to support innovation activities (% of respondents)



When asked about whether the technology infrastructure generally supports innovation activities at the unit, about 60% of respondents at two levels agreed that the current technology infrastructure supports innovation activities.

III.2.2.4. Innovation Policies

The questionnaire has a separate question for the leader, that is "Do you know any documents regulating on innovation related to the unit?" with the logic that public officers may not know or notice or the unit's leader will better understand the issue. There are 3 out of 5 leaders at all levels (from office leaders to departmental leaders) of MPI and 4 out of 5 leaders at 3 surveyed departments know relevant innovation documents to their units. The promulgation of regulations on innovation in departments of the three provinces is probably not as popular as that of the MPI. About 50% of public officials in the units surveyed by MPI and only 26.7% of public officials surveyed in the three provinces said that their units have regulations on innovation.

Three-thirds of the respondents from the MPI and two-quarters of the respondents from the three provinces claimed that their units have implemented innovation according to the regulations and policies. All of the above respondents believe that policies for innovation exert a positive impact on innovation activities in their units.

Individuals were asked about the complexity[22] of processes and procedures when conducting innovaion in their units, 54.5% of respondents in MPI and 60.0% of respondents in the three provinces said that processes and procedures custom were flexible. None of the informants at the provincial level said the process and procedures were very complicated, but 4.5% of the informants at the ministerial level commented that the process and procedures when implementing innovation were very complicated. Although not evaluating the process and procedures for implementing innovation as too complicated, at the provincial level, 26.7% of respondents still think that the process and procedures are complicated, higher than the rate of 4.5% in MPI.

[22] Consists of 3 levels: very complicated, complicated and fast, flexible

About 9-13% of respondents said that at units in the three provinces and MPI, there are no processes and procedures in innovation, that is, there are still some units that have not yet conducted innovation activities.

Figure 16: Issuance of regulations on innovation (% of respondents)

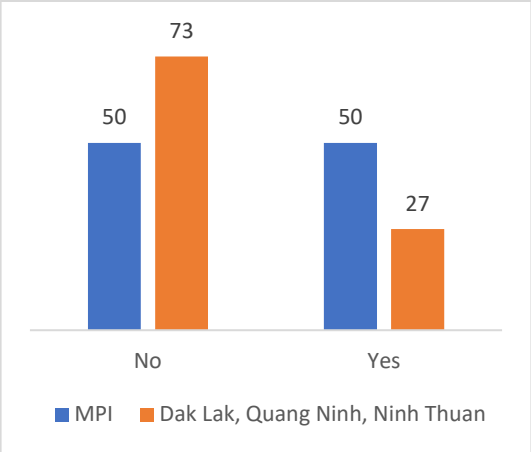
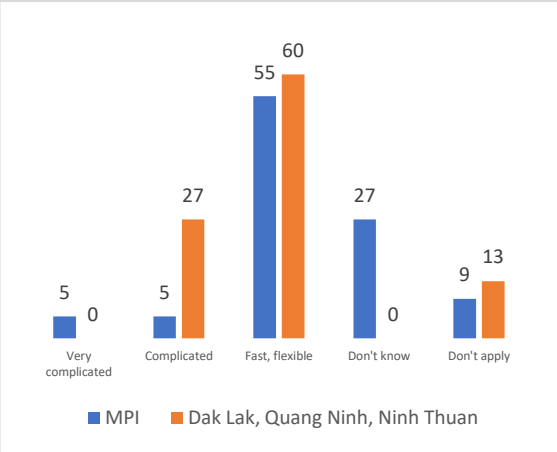


Figure 17: Complexity of processes and procedures when conducting innovation (% of respondents)



Public officers in the MPI and the three provinces were asked about the importance of four factors in promoting units to implement innovation on 4 aspects with the rating of Low (equal to 1), Medium (equal to 2) and High (equal to 2). 3). With mean values greater than 2, Figure 20 shows that most of them rate High importance for these factors. The rate of a High rating always accounts for nearly 60% or more (except in the case of PAR in MPI). Only 38.1% of public officials and public servants of MPI polled highly appreciated the importance of administrative reform (PAR) in promoting the implementation of NR at their units, lower than the rate of 57.1% who rated the average level. Three aspects (i) Deployment of e-Government, (ii) New Policy and (iii) Documents and directives to deploy new online services are appreciated more than the PAR aspect. Among them, aspects (i) and (iii) are the most appreciated.

Figure 18: Scores of importance of factors in promoting innovation implementation

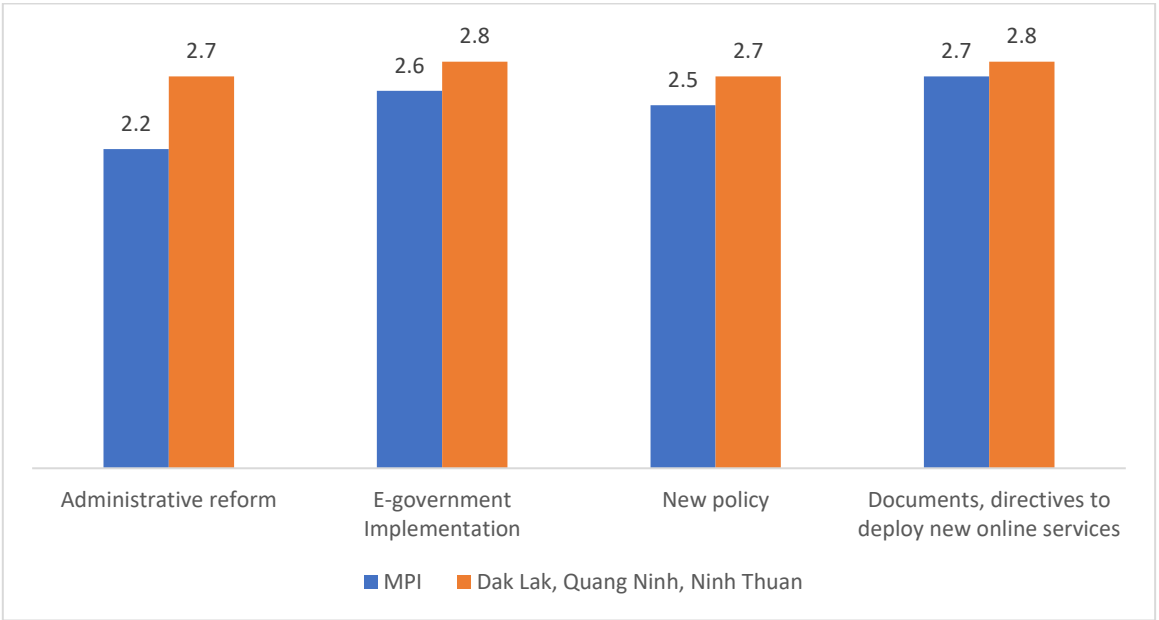
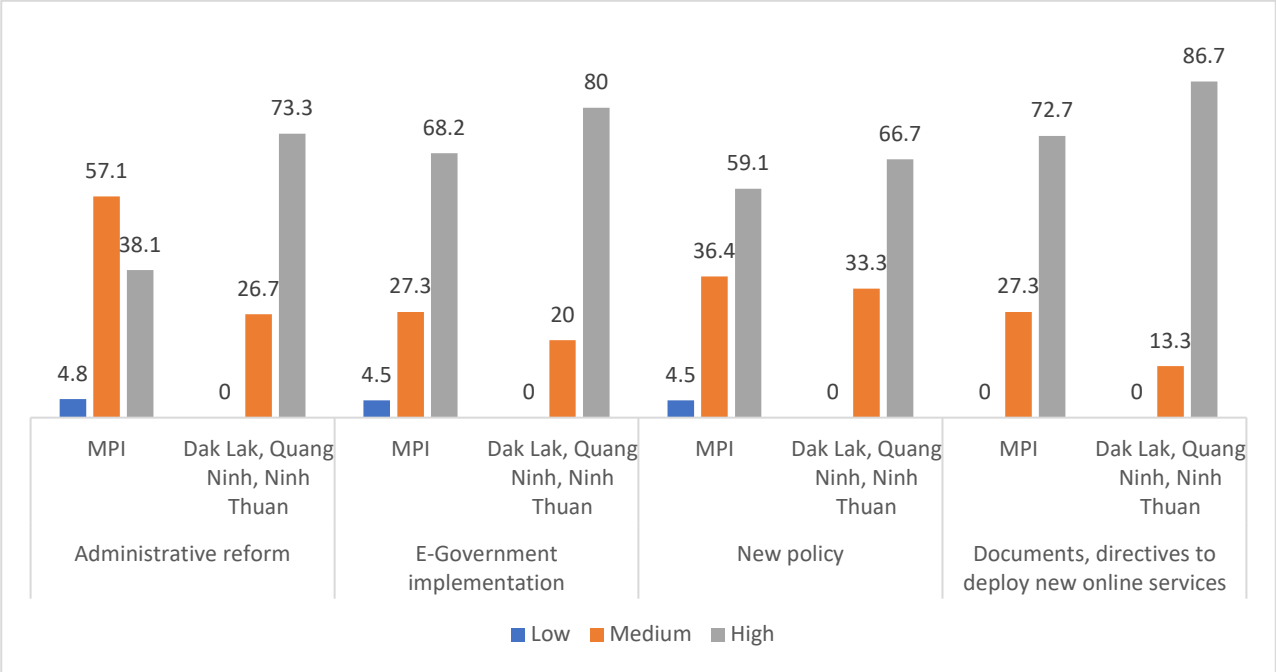


Figure 19: The importance of factors in promoting the implementation of innovation (% of respondents)

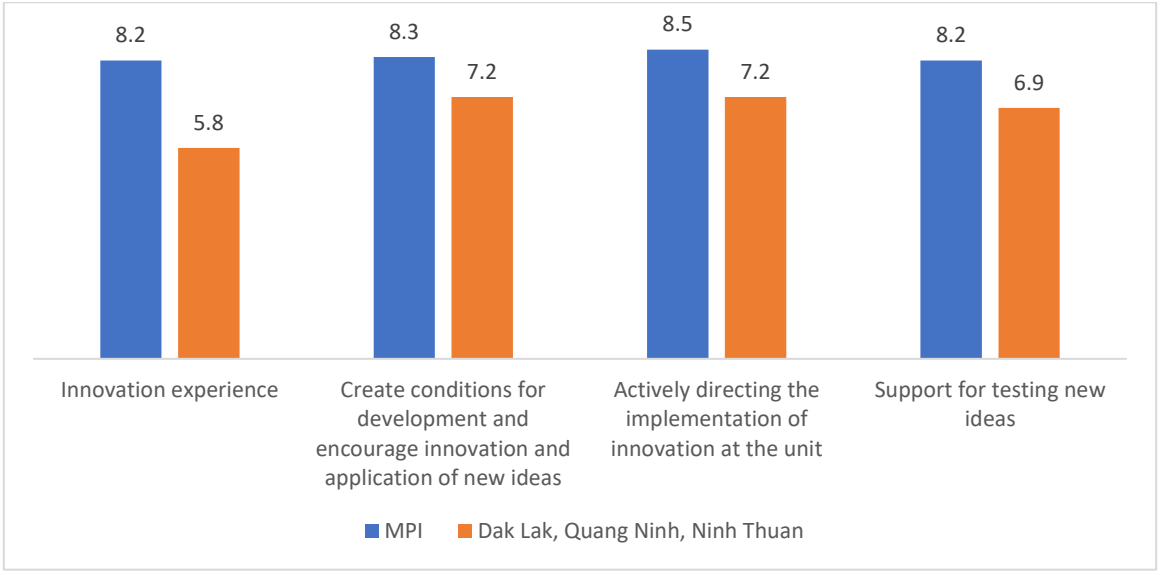


III.2.3. Axis component 2: Innovation capacity in the public sector

III.2.3.1. Leadership traits

The innovation capacity of the leader can be considered as the social capital of the organization, defined as the ability of managers to promote and create cooperation in the organization through interaction with subordinates (Kim & Kim, 2022). Leaders create an environment to support innovation, reward or recognize innovation implementers, and promote innovators. The innovation capacity of leaders is considered through four aspects: (i) Innovation experience; (ii) Create conditions for development and encourage innovation and application of new ideas at the unit; (iii) Actively directing the implementation of innovation at the unit; and (iv) Support for testing new ideas.

Figure 20: Average score of innovation capability of leaders



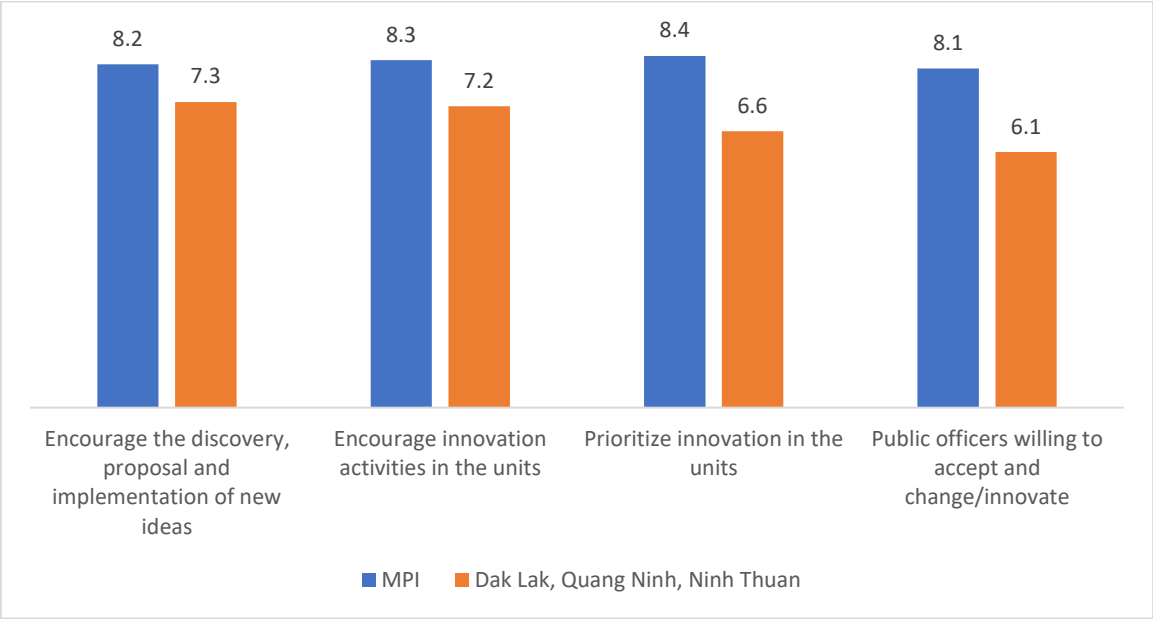
On a scale of 10 from the lowest to the highest, the role of the leader in the innovation activities of the unit is highly appreciated[23]. Among the four traits of leaders, civil servants in the three provinces are most appreciated for the characteristics of facilitating development and encouraging innovation, applying new ideas, and actively guiding the implementation of innovation.

Actively guiding the implementation of innovation of the unit leaders of MPI was also highly appreciated by the respondents. The remaining characteristics are evaluated with not much difference, but according to officials, leaders of ministerial-level units are still more hesitant in supporting the testing of new ideas.

III.2.3.2. Organizational culture

In general, civil servants in units under the MPI rated the organization's culture higher than those in the three provinces. The most underrated aspect at two levels is the acceptance and willingness to change/innovate by public officers. It is noteworthy that the difference between the mean score of this aspect in MPI (8.10) is not far from that of the second most underrated aspect (8.15), while the gap between the two dimensions of the lowest and the second lowest in the three provinces is quite far (6.08 vs. 6.58). Units under the MPI prioritize and encourage innovation within their units.

Figure 21: Average score of organisational culture

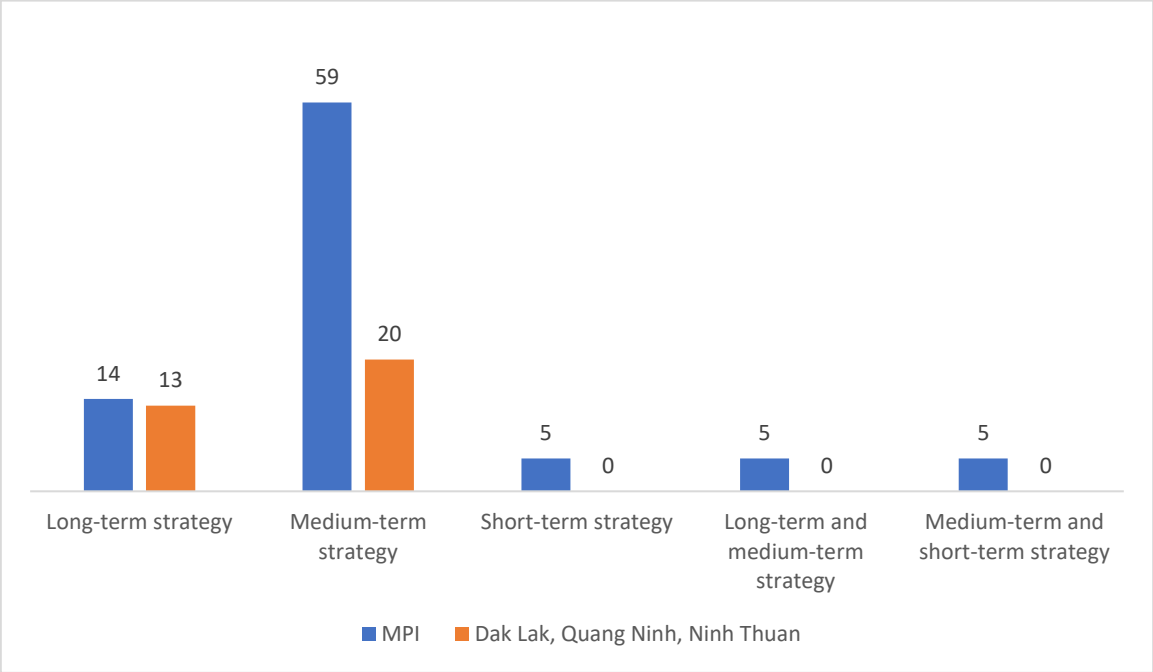


III.2.3.3. Innovation Strategies

Not only does the innovation strategy help the unit to orient innovation but also helps to avoid the term thinking. The analysis results show that about 68.2% of respondents in MPI and 35.7% of respondents in the three provinces said that their units had an innovation strategy. In which, there are mainly medium-term strategies. The proportion of provincial-level units having an innovation strategy is lower than that of ministerial-level units.

[23] The research team considered at the ratings of individuals who were leaders from the departmental level and above, and found that the measument results were higher than average. However, this number of individuals is too small to be included here, and the research team understands it to be the score of higher-level leadership or unit leadership in general rather than an individual self-assessment. However, it is not excluded the case that cadres and public officials give a higher leadership rating than they actually are due to some concerns if they give a low score or to benefit themselves. Therefore, it is possible to consider having a separate survey for leaders and public officials.

Figure 22: Percentage of respondents who said their working unit has different types of innovation strategies (%)



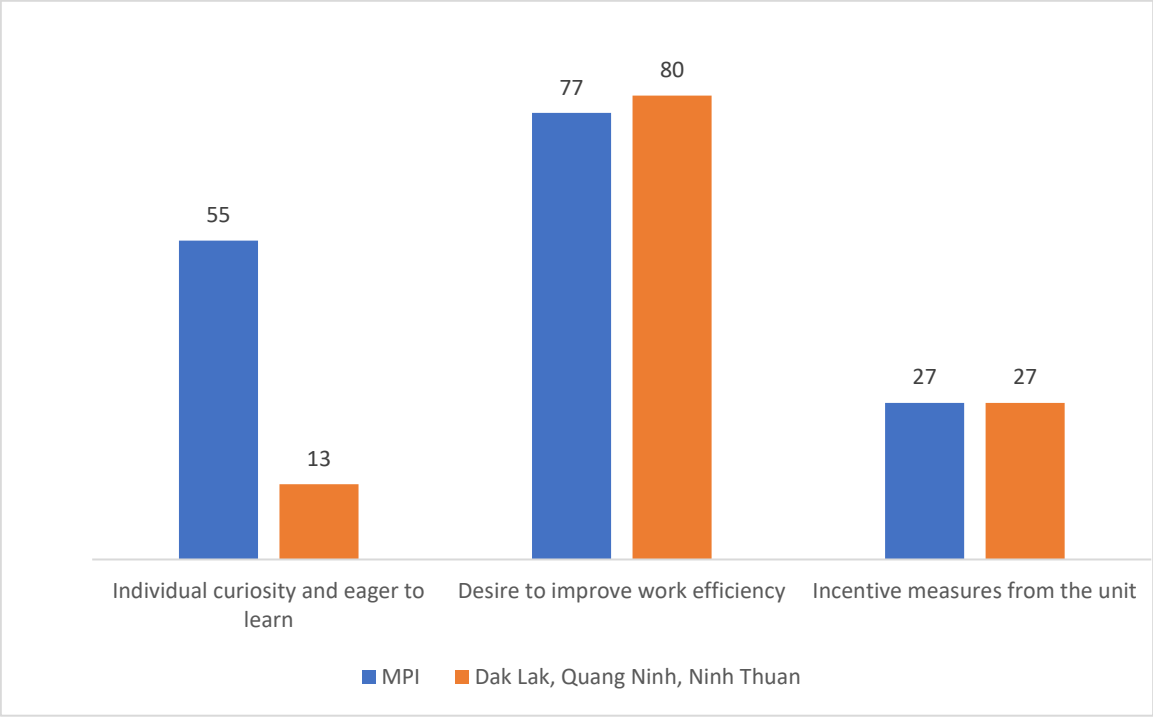
Note: Number of observations of MPI: 17; Number of observations of Dak Lak, Quang Ninh, Ninh Thuan: 5.

For units that have issued innovation strategies, it is still mainly a medium-term strategy (2-5 years) but not many units have a long-term strategy (greater than 5 years). This may affect the innovation activities of the unit in the following periods after the medium-term strategy ends and new leaders run the unit. There is only one opinion from MPI that their unit has a short-term innovation strategy (under 2 years) and that it is also a unit with a medium-term strategy. The number of people who think that an entity has a long-term and medium-term innovation strategy is also 1, showing that the concretization of a long-term strategy to achieve innovation goals is uncommon and this may partially affect the achievement of the company's innovation goals.

III.2.3.4. Motivation for innovation

There are 81.8% of the informants in MPI and 86.7% of the informants in the three provinces who are motivated to generate new ideas and participate in the development of new ideas. In which, the main motivation is to improve work efficiency (77.3% of public servants surveyed in MPI and 80.0% at the department level in 3 provinces). Curiosity and inquisitiveness are also important motivations for ministerial-level civil servants. In addition to personal motivation, incentives from the unit also promote innovation activities, as reported by approximately 27% of respondents.

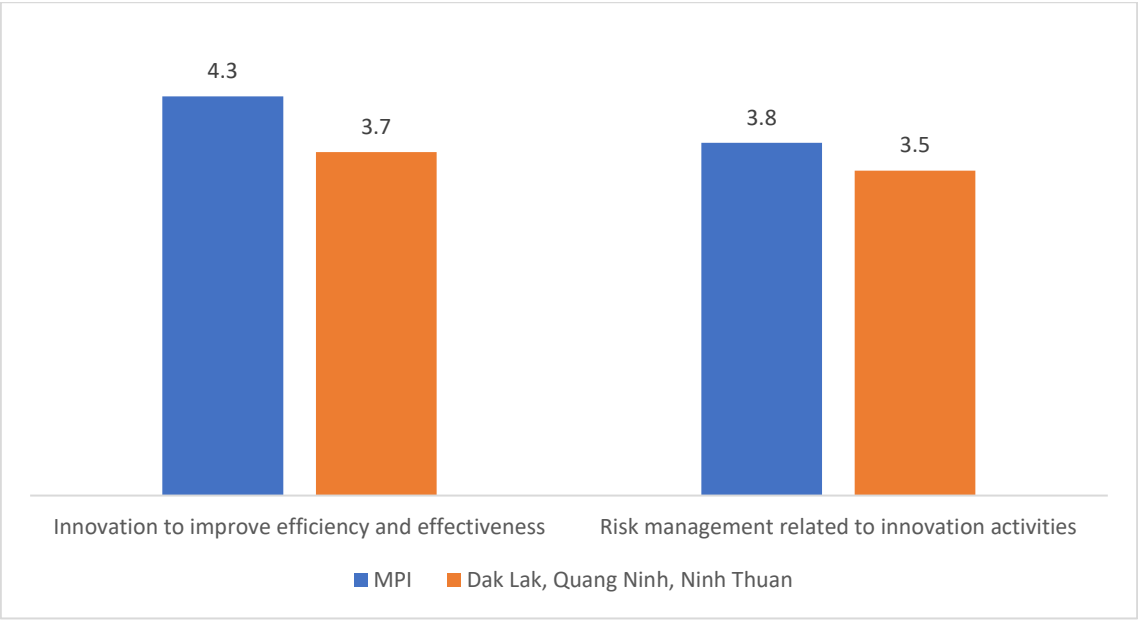
Figure 23: Percentage of respondents by types of innovation motivation (%)



III.2.3.5. Management of innovation

The respondents were asked to rate the innovation management at their units on a scale from 1 (Lowest) to 5 (Highest) in two aspects: innovation to improve efficiency and effectiveness; and Risk management related to innovation activities. For MPI and the three provinces, risk management related to innovation activities is rated lower than innovation aiming at efficiency and effectiveness improvement.

Figure 24: Evaluation scores of innovation management



In-

Figure 25: Evaluation scores of innovations to improve efficiency and effectiveness

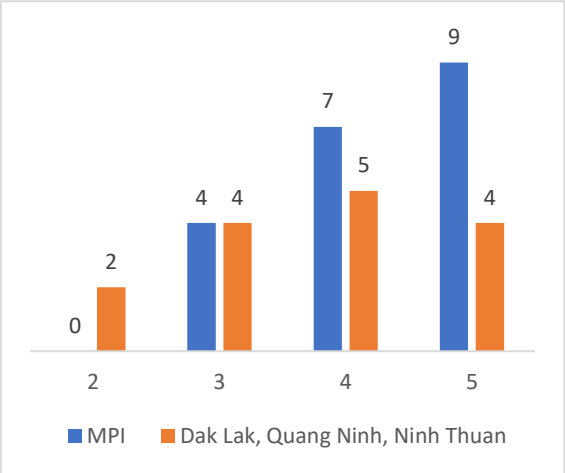
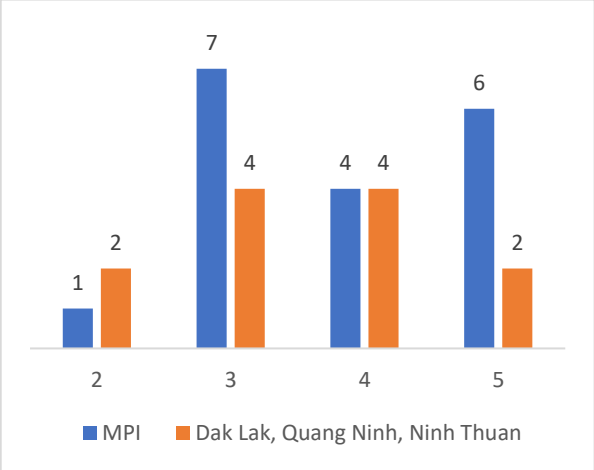


Figure 26: Evaluation scores of innovations related risk management



depth analysis of the number of people according to each evaluation level indicates that the number of public servants and officials of the MPI evaluating the innovation aspect to improve efficiency and effectiveness is directly proportional to the scale. In contrast, the number of ministerial-level individuals who rated the risk management aspect related to innovation activities at level 3 (average) was the highest, followed by level 5. Meanwhile, the majority of informants were in the three provinces rated the risk management related to innovation activities of their units at 3 (Medium) and 4 (Medium-High).

III.2.4. Component 3: Innovation process in the public sector

III.2.4.1. Approach, select, develop and implement new ideas

Among 22 civil servants and public servants surveyed at MPI and 15 people surveyed at the departmental level in 3 provinces, respectively, only 10 people and 6 respondents in the last year of their unit recorded innovation ideas/solutions with the average number of ideas of the two levels is 4.4 and 5 ideas, respectively. However, only about 33.3% of units at both levels have a system of evaluating and developing ideas of cadres and public officials.

In the same public sector, information sources from other Government units, other provincial units, and information from other departments and agencies in the sector have an influence on innovation activities of 66.7% and 57.1% of respondents of ministerial units and 73.3% of provincial units. With external sources of information, information from public service beneficiaries such as enterprises and business associations, from seminars, and from people's feedback is assessed by surveyed individuals as affects the innovation activities of the unit at a very high rate.

Figure 27: Information sources affecting innovation of the unit (% of respondents)

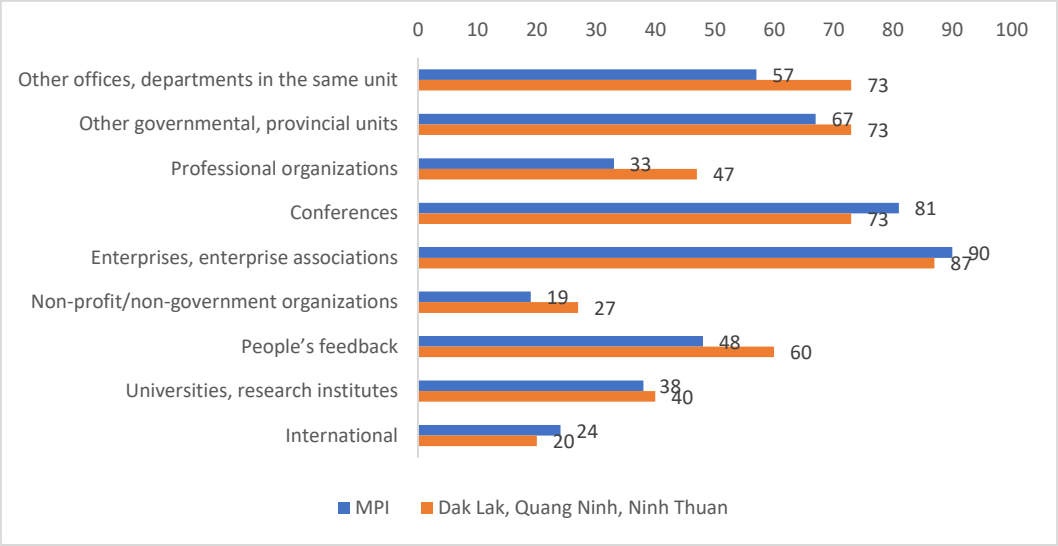
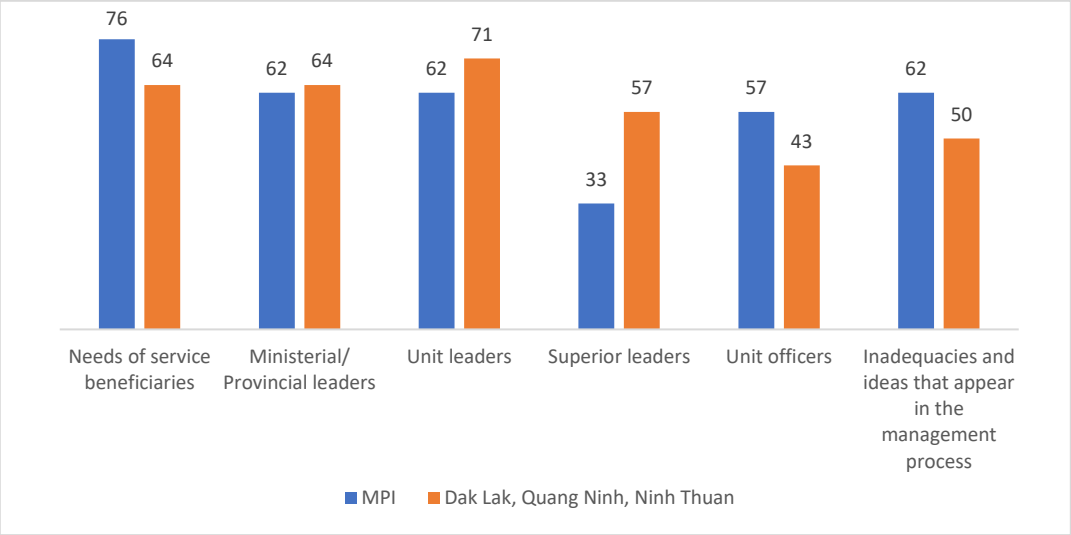


Figure 28: Important sources of ideas influencing innovation of the unit (% of respondents)



Important sources of ideas affecting the innovation of ministerial-level units include the needs of service beneficiaries (76.2%); leaders of ministries, leaders of units, and inadequacies or ideas appearing in the management process (61.9%). The role of public officials is quite important when 57.1% of respondents at the ministerial level and 41.9% at the provincial level think that the ideas of public servants affect the innovation activities of the unit. For provincial units, the most chosen source of information affecting innovation activities is the leader of the unit (71.4%); followed by provincial leaders and the needs of service users (64.3%).

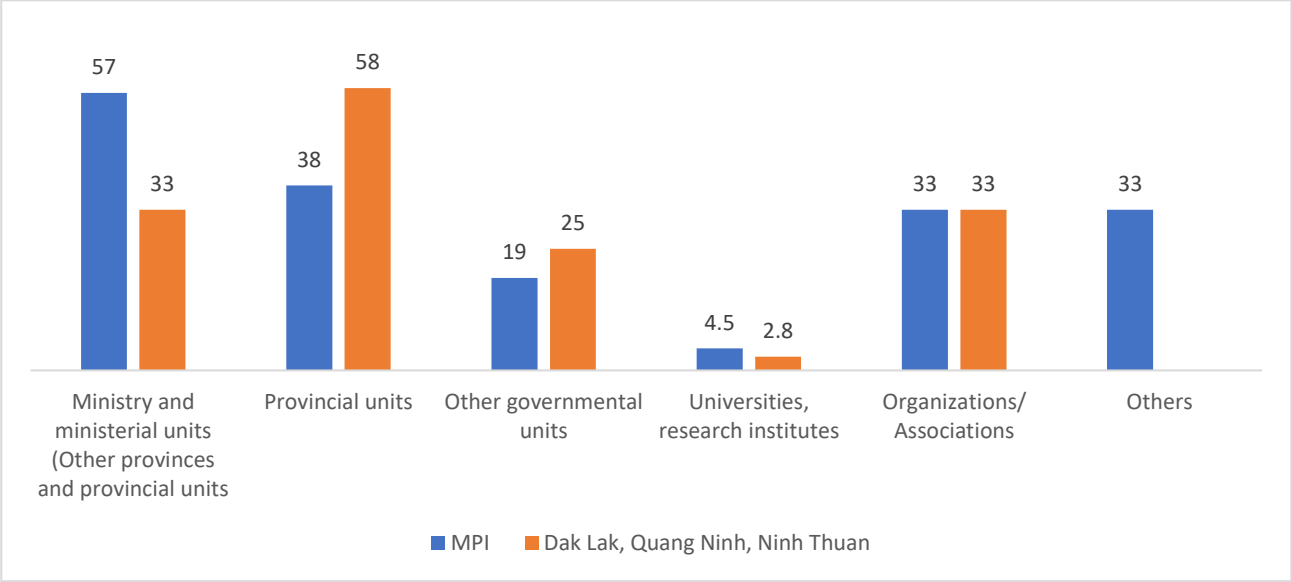
47.6% of the MPI and 41.6% of the respondents of the 3 provinces said that their units spend financial resources on the selection, development and implementation of ideas. On average, about 1.9 ideas of ministerial-level units and 2.8 ideas of provincial-level units have been developed into an innovation project and piloted in the last 2 years.

III.2.4.2. Collaboration for innovation

The interviewed units paid close attention to innovation cooperation. There are 81.0% of people surveyed in MPI and 66.7% of people surveyed in 3 provinces who said that their units have cooperation in innovation.

For MPI agencies, the rate of cooperation with the Ministry and other ministerial-level units is the highest (57.1%), followed by provincial units (38.1%). With units of the 3 provinces, the rate of cooperation with provincial units is the highest (58.3%), followed by educational institutions, universities and research institutes (41.7%).

Figure 29: Innovation collaboration units (% of respondents)



To learn more about innovation cooperation, the research team asked about the level of cooperation within the unit and with other units for innovation with the rating from 1 (at least) to 5 (the most). The average score of cooperation level of 3 or more shows that cooperation on innovation is at an average level or higher. Figure 26 shows the units of MPI, collaborating internally and with other units with a level equal to or higher than that of the provincial units. With the three provinces, cooperation within the unit is more common than cooperation with other units.

Figure 30: Average score of innovation collaboration

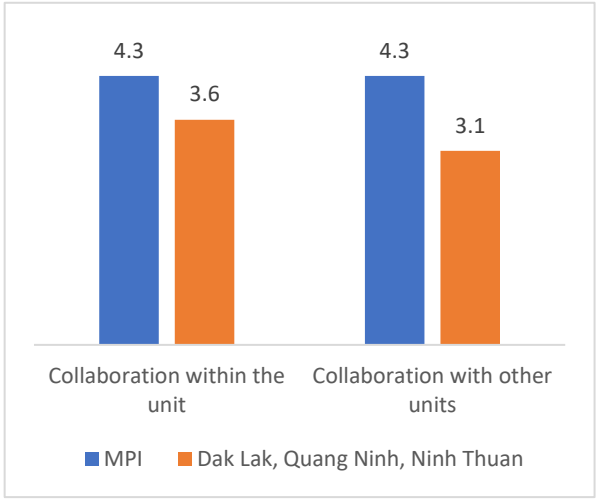
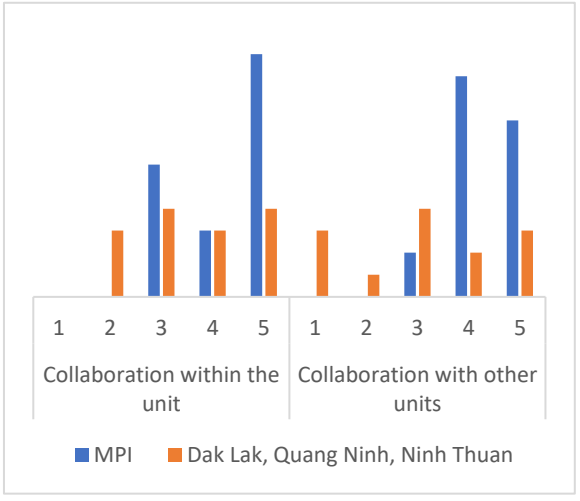


Figure 31: Average score of innovation collaboration



III.2.4.3. Innovation diffusion

One of the critical activities of the innovation process is to spread ideas and share innovation results for other units to learn and apply. 19 out of 22 respondents from MPI and 12 out of 15 respondents from the three provinces answered a question about their unit's dissemination/sharing of innovation results. In which, there are 8 informants at the ministerial level and 2 at the provincial level who do not know if their units have ever spread innovation. Thus, according to 50% of MPI's respondents and 53.3% of respondents of 3 provinces, the unit has disseminated/shared innovation results.

Figure 32: The number of units that have ever disseminated/shared innovation

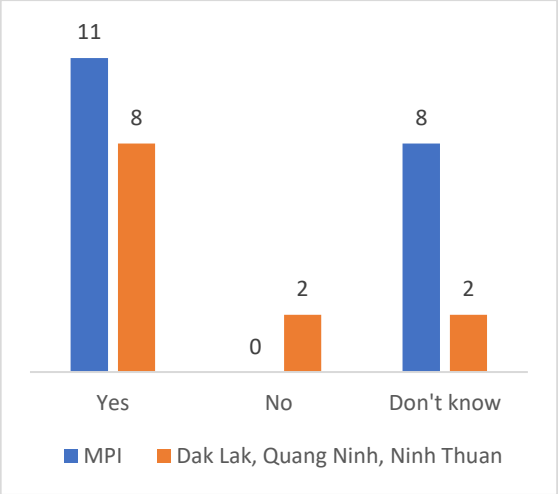
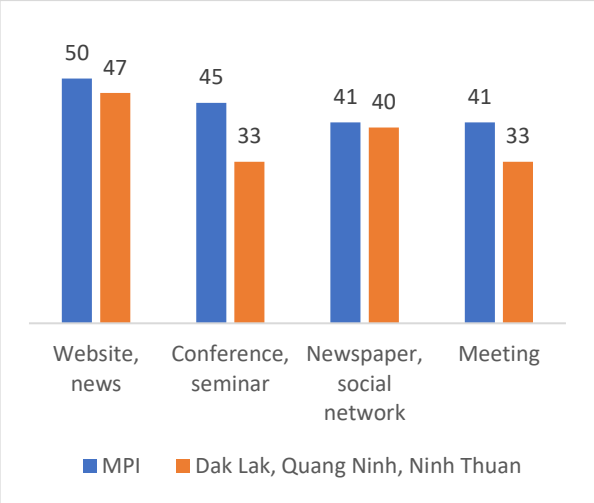


Figure 33: Percentage of units diffusing innovation on information channels (%)



Further diving into the innovation diffusion channels of the unit, 50% of the people surveyed by the MPI said that their units disseminate/share information about innovation through websites and newsletters; 45.5% through conferences and seminars; and 40.9% through two channels of newspapers, radio, social networks and through meetings. Websites and news are also the most widely used channels for spreading innovation, followed by newspapers, radio stations and social networks; and finally, conferences, seminars and through meetings.

III.2.4.4. Innovation Assessment

Among the 20 respondents from MPI and 15 respondents from the three provinces who answered the question on innovation assessment, 65.0% and 66.7% respectively said that their units have carried out an innovation assessment in the past 2 years (through the method: internal self-assessment and expert consultation). Only 10% of informants in ministerial-level units said that the unit holds an evaluation plan but has not yet implemented it.

Figure 34: Percentage of respondents who said that the unit has and plans to evaluate innovation in the past 2 years (%)

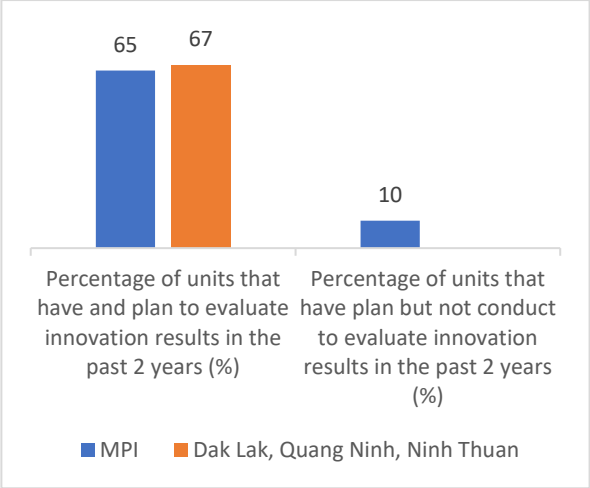
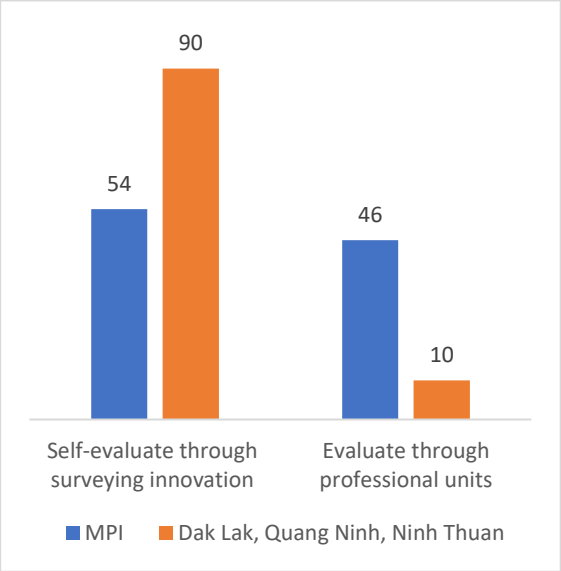


Figure 35: Methods to evaluate innovation (%)

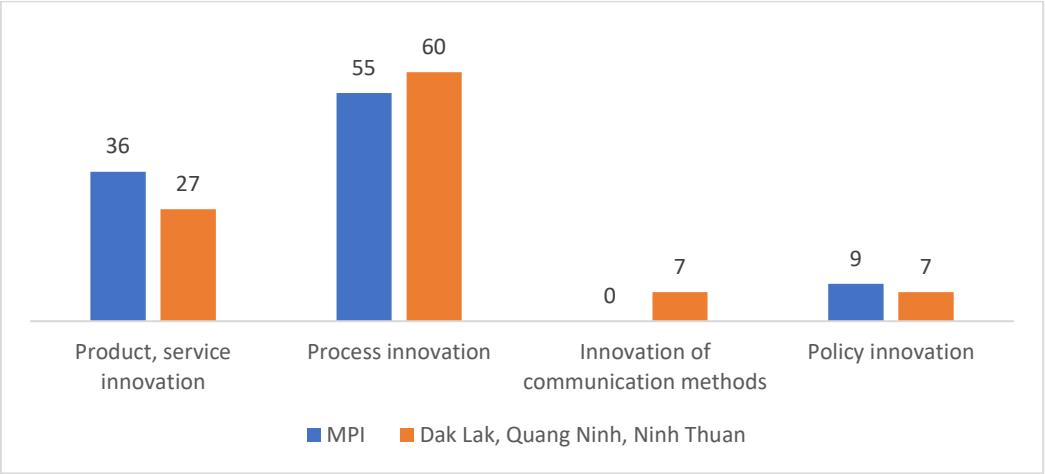


Among the units that have carried out the innovation assessment, about 53.8% of the MPI and 90.0% of the respondents of the three provinces think that their units have self-assessed through the survey of innovation beneficiaries, and about 46.2% of the opinions of the MPI and 10% of the opinions of the departments in the three provinces evaluated through a professional unit.

III.2.5. Component 4: Innovation outputs in the public sector

The questionnaire has its own content explaining the concept of innovation and types of innovation in the public sector with illustrative examples so that respondents can easily visualize and have accurate answers. The selection of survey respondents who are leaders and public officials relating to or directly involving in innovation activities also aims to increase the reliability of the answers. The surveyor asked about 4 types of innovation (product/service innovation, process innovation, innovation of communication methods and policy innovation) that the unit has implemented in the past 2 years.

Figure 36: Percentage of respondents whose units have implemented innovation in the last 2 years (%)



The survey results show that the type of innovation that organizations do the most is process innovation (54.5% of MPI's respondents and 60.0% of respondents in 3 provinces think that their units are implementing them), followed by product and service innovation (36.4% and 26.7%, respectively). The percentage of

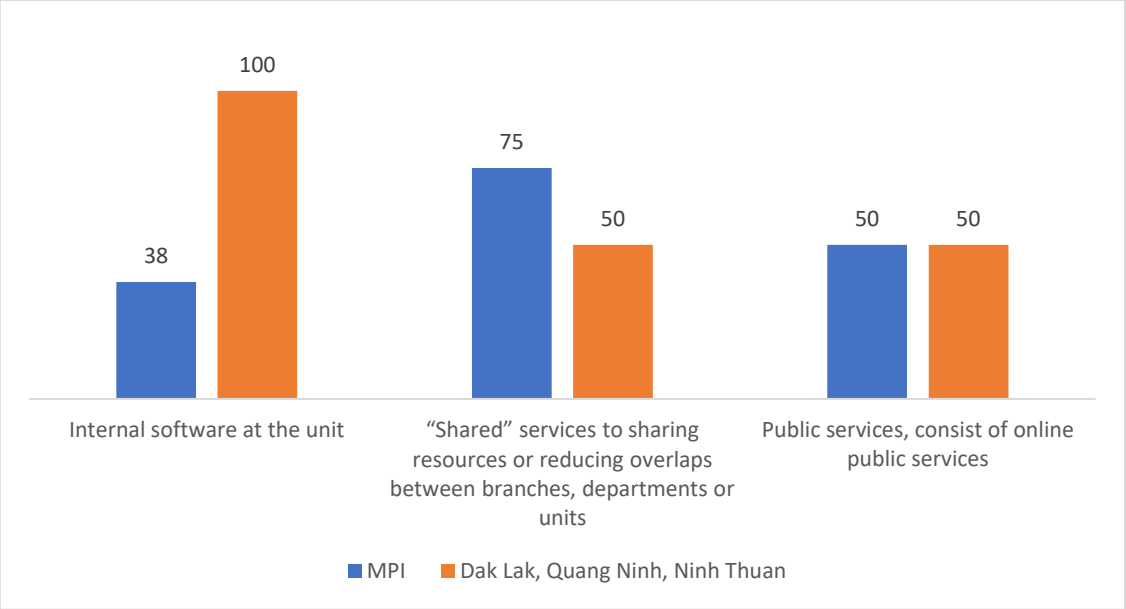
respondents implementing innovation in communication methods and policy innovation is quite low. This result is in accordance with the pilot survey of APSII in 2011 or the Danish Innovation Barometer 2018/2019 (COI & OPSI, 2021). It is noticeable that the surveyed units only carry out one type of innovation separately, not implementing many types of innovation at the same time[24]. To find out the reasons why units only carry out one type of innovation, additional questions need to be generated.

III.2.5.1. Product and service innovation

(a) Types of product and service innovation

There are 36.4% of the MPI and 26.7% of the respondents of the three provinces responded that their units have innovated products and services in the past 2 years, including (i) internal software at the unit; (ii) A "common" service to share resources or reduce duplication between branches, departments or units; and (iii) Public services for citizens or businesses, including online public services. “General” services are quite common among the surveyed ministerial-level units (75%). Respondents at the provincial level all use new or significantly improved internal software. About 50% of the surveyed ministerial and provincial units provide public services (including online public services) to citizens and businesses.

Figure 37: Percentage of respondents whose units have implemented different types of product and service innovation (%)



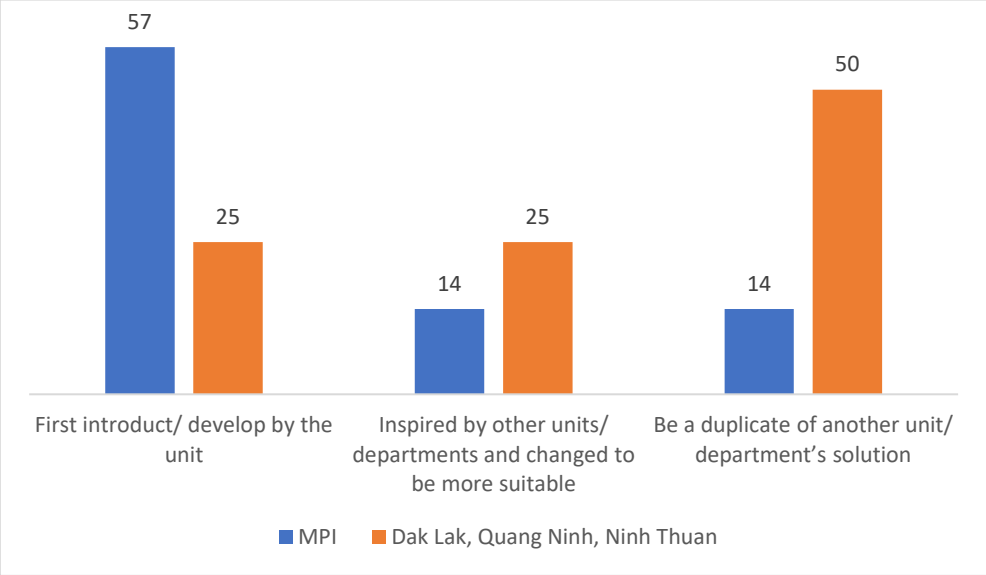
(b) Novelty of product and service innovation

The novelty of innovation is evaluated according to 3 levels from low to high: (i) It is a copy of another unit's solution; (ii) Be inspired by other entities and change accordingly; (iii) First introduced by the entity. With the units of the MPI surveyed, products and services developed by the unit account for the highest percentage (57.1%). Meanwhile, 50% of the respondents said that the products and services at the provincial units were asked to be copies of the solutions of other units/departments. This does not completely imply that ministerial-level units are more creative, but provincial units may not have sufficient conditions to promote

[24] Question “A3. In the past 2 years, has your organization implemented innovation at the level of renewal or significant change in the areas listed below? *(Select multiple items)”* allows respondents to choose many types of innovation that the unit implements.

creativity and create new products bearing their own imprint. Sometimes, the application of solutions of other units is the most less time-consuming and cost-saving way of innovation.

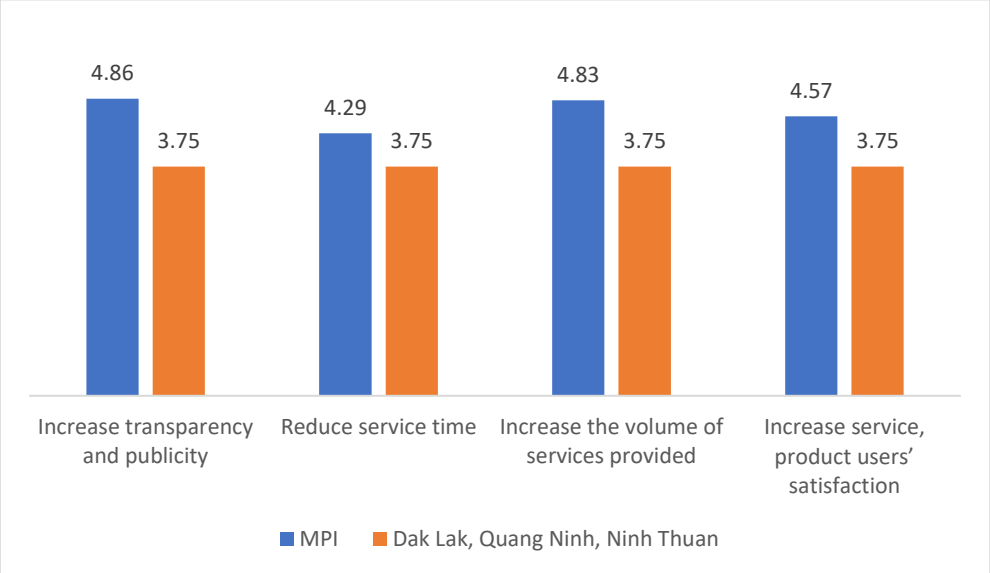
Figure 38: Novelty in the latest product and service innovation (% of respondents)



(c) Impact of product and service innovation

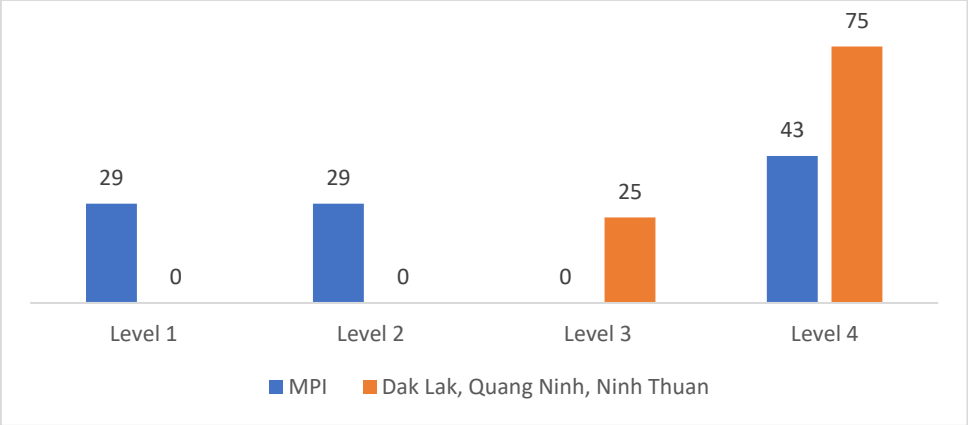
The results of new products and services or significant changes that the unit has implemented in the past 2 years are evaluated on 4 aspects on a Likert scale from low to high. A large proportion of people surveyed at MPI rated the results as high, and the aspects of an increase in openness and transparency and an increase in service delivery were rated the highest (4.86 and 4, respectively). 83). The result of increasing the satisfaction level of product and service users is rated as the third highest score, ranked on the aspect of shortening service delivery time. A large proportion of respondents in 3 provinces rated the results at 3 (Medium) and 4 (Medium-High) with equal scores for the 4 dimensions of product and service innovation results (3.75).

Figure 39: Impacts of product and service innovation (% of respondents)



To gather more information about online public services at the unit, the questionnaire asked “Can you tell me the level of online public services at your unit according to Circular 32/2017/TT-TTTT ?”. The results show that, while none of the surveyed provincial-level units have online public services at levels 1 and 2, up to 28.6% of opinions in MPI fell at these two levels. About 41.9% of people surveyed at MPI and 75.0% of people surveyed in the three provinces rated online public services in their units as 4.

Figure 40: Level of online public services (% of respondents)

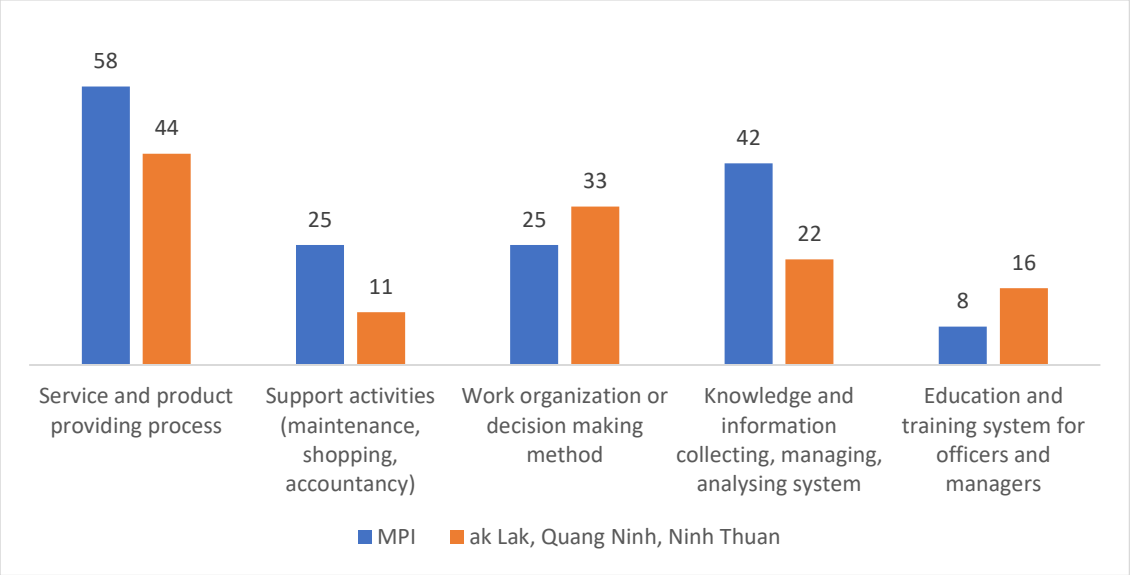


III.2.5.2. Process innovation

(a) Types of process innovation

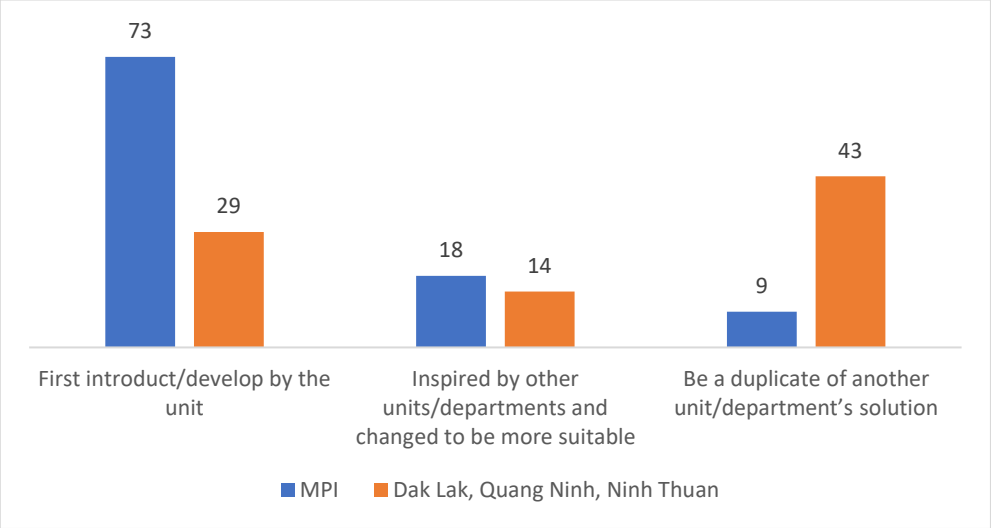
54.5% of MPI's respondents and 60.0% of respondents in the three provinces said that their units have implemented process innovation in the past 2 years, including 5 categories. In which, the percentage of units with a process of providing new or significantly improved products and services accounted for the highest proportion (58.3% of MPI respondents and 44.4% of respondents of 3 conscious). The percentage of ministerial-level units that innovated processes in the form of knowledge and information collection, management and analysis systems was the second highest (47.7%). Meanwhile, the type of process innovation that the provincial unit undertakes the second most is the work organization or decision-making approach. The application of the new training system has not been widespread in units at both levels.

Figure 41: Percentage of respondents whose units have implemented different types of process innovation (%)



(b) Novelty of process innovation

Figure 42: Novelty of the latest process innovation (% of respondents)

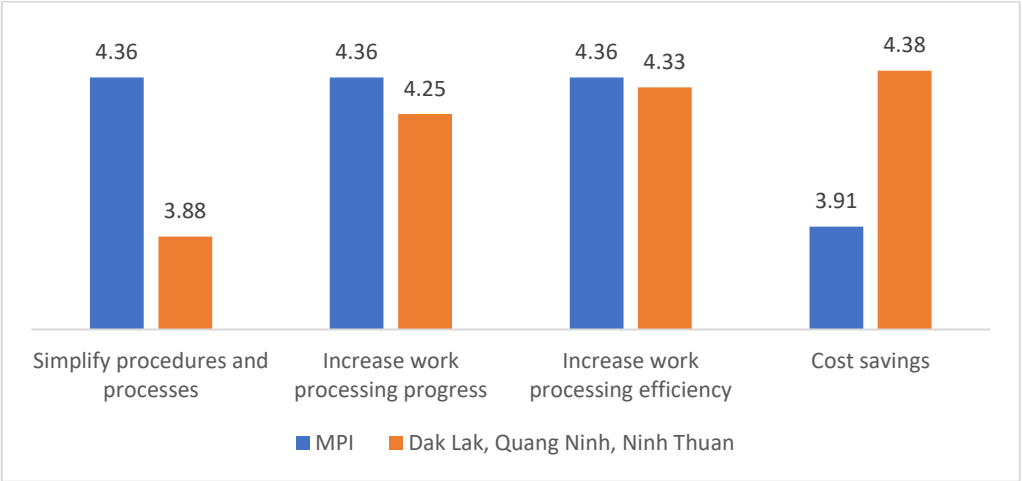


Within the three levels of innovation novelty, the first introduced/developed by the entity is the highest level. Up to 72.7% of MPI's opinions said that the unit's latest process innovation was developed by the unit, nearly 3 times higher than the response rate of three provinces. In contrast, according to 42.9% opinions of departments in the three provinces, the unit's latest process innovation is a replication of another unit's solution.

(c) Impacts of process innovation

Respondents were asked to rate the results of different types of process innovations on a Likert scale (from low to high). No public servants rated the results at level 1 (lowest) and only 1 opinion in MPI and the three provinces rated level 2 with cost saving results. The remaining three aspects are rated at level 3 or higher. Aspects (i) Simplifying administrative procedures, (ii) Increasing work processing speed, and (iii) Increasing work processing efficiency are highly appreciated by MPI staff (4.36%). While the cost-effectiveness of process innovations at the ministerial level is not obvious, the results are appreciated at the provincial level. In contrast, process innovation that simplifies administrative procedures at the provincial level was evaluated with the lowest average score.

Figure 43: Impacts of process innovation (% of respondents)



III.2.5.3. Innovation of communication methods

Only 1 out of 15 respondents from the three provinces answered about this type of innovation. Accordingly, the percentage of units implementing innovation in communication methods in the past 2 years was 0% in MPI and 6.7% in the three provinces. Only 1 informant at the provincial level responded to information on innovation of communication methods, novelty and results of innovation of communication methods, so the calculated results have no reference value.

III.2.5.4. Policy innovation

There are 2/22 respondents from MPI and 1/15 respondents from 3 departments in the three provinces about this type of innovation. Accordingly, the percentage of ministerial-level and provincial-level units implementing policy reform is 9.1% and 6.7%, respectively. The specific information on the type of policy innovation, novelty and results of policy innovation are also only answered by these 3 units, so the calculation results have no reference value.

IV. CONCLUSION, RECOMMENDATIONS, LESSONS AND NEXT STEPS

IV.1. Conclusion

This report has conducted 5 steps, including (i) an overview of the concepts of public sector, innovation, and innovation in the public sector; (ii) review research on innovation in the public sector around the world; (iii) review of innovation policy in Viet Nam; (iv) propose a framework of criteria for measuring innovation in the public sector for Viet Nam; and (v) present the results of pilot survey to measure innovation in a number of units of the MPI and a number of departments under the provincial People's Committee. The results of the policy review show that currently, Viet Nam neither has a separate strategy for innovation nor an innovation strategy in the public sector. Therefore, there is a lack of legal basis when developing a criteria framework for accurate guidance and assessment.

Regarding the pilot survey, the survey scale is quite small (4 units of the MPI and 3 departments of the three provinces) and the number of votes collected is quite small (a total of 37 votes), so the survey results are only valid in the surveyed units.

The survey results show that process innovation is the most commonly implemented (54.5% of respondents in MPI and 60% of respondents in the three provinces implement process innovation), followed by product and service innovation. The percentage of units which believe that public servants meet the requirements of proposing and implementing innovation is quite high, but public servants still lack the capacity to dare to think, dare to do, dare to take risks and willing to accept change/innovation. Units are still facing financial difficulties, and IT machinery and equipment for innovation are still limited. Innovation motivation mainly comes from individuals (wanting to improve work efficiency; being curious and knowledge-seeking), and the incentive measures of the unit also exhibit a certain effect in promoting innovation. The interviewed units relatively focused on innovation collaboration, innovation diffusion and innovation assessment.

IV.2. Policy recommendations

IV.2.1. Recommendations related to institutional construction

The government plays an important role in initiating, directing, regulating and connecting resources on innovation. The government's role in creating an innovation-led economy is witnessed in the sweeping and comprehensively reforming legal and policy environment. The definitions and goals of innovation in innovation programs in the public sector around the world also consider policy as a prerequisite factor in

innovation. For example, the European Commission's innovation goal focuses on institutional building, and APSII also considers policy innovation as one of the pillars of innovation.

Therefore, to develop innovation in Viet Nam, it is necessary to focus on improving institutional quality and policy-making capacity. In particular, a task that needs to be done promptly in the near future is to issue a separate strategy, dedicated to activities of **innovation in the public sector** and the Law on Innovation Promotion. This strategy needs to separate the objectives, policies and financial mechanisms of the public sector and the private sector because innovation activities in these two areas represent many differences in implementation methods and mechanisms.

Viet Nam also needs to review and propose amendments and supplements to the system of legal documents in specialized fields to meet the requirements of adjusting new relationships arising in innovation, removing bottlenecks, barriers and creating favourable conditions for innovation activities.

Besides, there is a substantial call to develop a controlled experimental legal framework for the development, testing, and application of digital products, solutions, services, and innovations in Viet Nam, specifying the spatial and temporal scope pilot, to encourage innovation in areas including public sector.

In addition, it is necessary to review and refine institutions in the direction of encouraging domestic digital technology enterprises to invest in application development and research and master new technologies, and have a mechanism for these enterprises to participate. in deploying digital applications to serve the direction and administration of the Government.

IV.2.2. Recommendations related to the national innovation system

International experience implies that the solid support of leaders at the highest level - such as the Prime Minister - is a prerequisite for the success of an innovation policy in a country. In China, where the political regime is similar to that in Viet Nam, the State Council operates according to the policy of the Standing Committee of the Politburo of the Central Committee[25] and builds the basic direction of the national innovation policy. Ministries and ministerial-level agencies perform various functions under the direction of the Steering Committee of the State Council. Viet Nam also needs leadership participation at the highest level to promote innovation comprehensively, systematically and effectively. It is necessary to strengthen the National Innovation System (NIS) to systematize innovation policy; define goals and visions on innovation for each ministry, branch and locality; and measure the level and effectiveness of innovation in each period, thereby making appropriate policy adjustments[26].

IV.2.3. Policy recommendations for innovation infrastructure development

In international innovation measurement indicators, innovation infrastructure always plays as a key criterion. Specifically, ICT infrastructure is an important input in the MEPIN and EPSIS 2013 surveys, while technology infrastructure is an important input in the 2010 APSC survey. Therefore, to promote innovation in the public sector, it is necessary to develop infrastructure. Digital government across three levels (national, ministerial and provincial) needs to be ready to respond to the administration and direction of state administrative agencies in the digital environment; towards the goal of providing all public administrative services to people and businesses in a completely digital environment.

Focusing on building and developing infrastructure for research, development and innovation centers must not be neglected while developing and proposing special and breakthrough mechanisms and policies for the

[25] The highest organization of the Communist Party of China.

[26] See more about Viet Nam's national innovation system improvement strategy and S&T and innovation policy framework in Viet Nam 2035's Report (World Bank Group & Ministry of Planning and Investment, 2016).

construction and operation of innovation centers in general and in the public sector in particular, and to develop a closely associated national innovation ecosystem with the region and around the world.

IV.2.4. Recommendations on human resources

According to OECD (2019), innovation at the individual level is one of the three levels of innovation and plays an essential role. In the survey of LSEPPG 2008, APSC 2010, and EPSIS 2013, human resources serve as an essential input of innovation. However, according to the pilot survey, the percentage of units with people participating in innovation activities is quite low: only 18.8% of the people surveyed in the Ministry of Planning and Investment and 37.5% in the three provinces have public servants who are assigned to propose innovation. The solution now is to develop innovative human resources in the public sector with high innovation qualifications and capabilities, and assign them to be in charge of innovation. Furthermore, implementation of training solutions and improvement of quantity and quality of human resources for management and innovation are of essence. Additionally, it is significant to continue the selection program and sending highly-qualified science and technology human resources in prioritised and key fields to countries with advanced science and technology for training.

Creation of a mechanism to attract talents in the fields of research, development and innovation to work in the public sector, including salary and bonus mechanisms, financial assurance and commitment are crucial so that high-quality personnel can rest assured to serve and dedicate themselves in the public sector. Finally, public investment in information technology projects in state agencies to attract talent to work in the fields of digital transformation, digital government and innovation should be increased.

IV.2.5. Recommendations on investment and financial policies for innovation

To promote innovation in the public sector, the Government needs to prioritize funding from the state budget to serve activities to support awareness transformation, institutional creation, digital infrastructure development, digital platform development, and innovation.

IV.2.6. Recommendations on policies on collaboration, research and innovation development in the digital environment

Innovation-based breakthrough and growth have been and will be the development focus of many countries. Developed countries such as Japan, Korea, Germany and the US are investing heavily in this field and have achieved encouraging achievements based on innovation. Latecomers such as China and Singapore have also made progress in promoting economic growth by investing in innovation. Viet Nam needs to learn from the success and failure experiences and lessons of developed countries and countries with similar conditions to form orientations in formulating policies to encourage and promote innovation. In the coming time, Viet Nam needs to actively promote cooperation and international integration on innovation. It is essential to strengthen international cooperation in exchanging policies and experiences in implementing innovation models and solutions with international partners, thereby offering solutions for innovation in Viet Nam while strengthening international cooperation in order to learn and transfer advanced scientific, technological and innovation management models in service of improving the capacity of management apparatuses at all levels must be taken into consideration.

Active participation and effective contributions to the development of international legal frameworks on innovation should be promoted. Lastly, strengthening activities to honour, communicate, reward and raise awareness about innovation while forming awards for innovation activities in the public sector is imperative.

IV.3. Lessons and limitations of the pilot survey and next steps

IV.3.1. Lessons and limitations of the pilot

a. About the preparation of the pilot

The pilot survey was conducted in a relatively short period of time because we spent a significant amount of time on building the questionnaire, and building and testing the software. Although only 41 answer sheets have been collected (in electronic form--declared online and in paper form, of which 37 are valid), the research team decided to close the number of votes and conduct processing and analysing data. The number of valid votes was quite small, showing that the new survey was based on a voluntary spirit without a legal basis forcing the units to conduct the survey.

Drawing experience from the pilot survey, the research team realized that the preparation work (in terms of budget, time, human resources....) is very important[27]. To survey the framework of criteria for innovation in the public sector to become an annual activity, it is necessary to develop a plan and allocate a budget from the end of the previous year and the preparation should be carried out from the beginning of the survey year. This preparation includes at least the following main steps such as: (i) development of a survey plan (number of survey units, survey plan and time...), budget proposal and human resource plan; (ii) develop a survey form (based on the adjustment of the previous year's survey form and the addition of new and outstanding elements); (iii) communicating, propagating, and disseminating information before conducting the survey. At the end of each survey, it is necessary to draw lessons for the next time.

b. About the survey method

Pilot survey was conducted in 02 methods (online and paper form). After obtaining the paper questionnaires, the research team had to perform the additional step of entering these questionnaires into the survey software in order to extract the data. Therefore, it is suggested that the survey should be conducted entirely online to save time and reduce workload.

To conduct the survey completely online, it is necessary to add some features to the current survey software to save time and convenience for respondents[28]. There should be a team of collaborators to guide and help respondents fill in information on the software. These collaborators may be civil officials at the surveyed unit who have undergone a short training course on surveying skills.

In addition, it is also necessary to conduct in-depth interviews in a number of units to better understand the status of innovation, resources and inputs, factors promoting and hindering innovation, difficulties that the units are facing, and identifying any expectations/requirements to promote innovation activities at the unit. Information from in-depth interviews is necessary and valuable for analysing results and proposing solutions and/or policy recommendations.

c. About the criteria framework

One of the objectives of the pilot survey is to determine the reasonableness of the criteria in the criteria framework. Because in-depth interviews have not been conducted, this objective has not been completely satisfied. However, some lessons can be drawn as follows: (i) Continue to research, exchange international experiences, and update the Criteria Framework for measuring innovation in KVC to be more suitable to

[27] It can refer to the statistical information production process model (GSBPM) being applied in many countries and at the General Statistics Office.

[28] For example, adding a feature to save survey results so that respondents can return to answer when they have time if they have to stop halfway. The current software does not have a function to save results, so either if you press submit when not completed, the unanswered questions will be blank (affecting the analysis results) or the respondents will have to re-survey from head.

practical implementation in Viet Nam. In which, inheriting the existing sets of indexes such as Provincial Competitiveness Index (PCI), Provincial Public Administration Performance Index (PAPI), Public Administration Reform Index (PAR-index), the Administrative Service Satisfaction Index (SIPAS), the Digital Transformation Index (DTI) and the Business Regulatory Reform Efforts Index. Indicators in the Criteria Framework aim to have Viet Nam in the group of 30 leading countries in innovation (GII) by 2030; (ii) Add targets on soft infrastructure; (iii) Continue to add specific and specific indicators for ministries, regions, provinces, as well as different sectors so that the assessments are objective, practical and suitable for different surveying groups.

d. About the content of the survey

The questions in the questionnaire are arranged according to information flow so that respondents can answer all the necessary information in PSII without being interrupted or having to return to the top to find relevant information. With the awareness that the concept of innovation in KVC is not yet popular and in order to obtain the most reliable results, the research Team has tried to "Vietnamese-ize" the terms, interpret and detail the concept of innovation and types of innovation with examples[29]. However, it is necessary to review and continue to edit the survey questionnaires in the next rounds. Consider building a separate survey for leaders and public officials, classified by ministries, branches and provinces.

e. About the survey object

To ensure the reliability of the information, the survey respondents in the survey form are the leaders of the units and officials and public servants involved or directly carrying out innovation activities. The number of these subjects is quite small, so it is necessary to increase the number of survey units to ensure the necessary number of votes.

g. About difficulties and challenges in data collection

The provinces contacted for the survey were only based on the relationship of the NIC without any legal documents regulating the obligation to participate in the survey. Unfortunately, some provinces that are prominent in innovation activities (for example, Thua Thien – Hue and Tay Ninh) do not have answer sheets. The survey is completely voluntary, so contacting and urging the implementation of the survey takes a lot of time and effort.

h. About limitations due to respondents' bias

Through the survey results, the research team found that many respondents were highly self-evaluating the innovation capabilities and conditions of their units. Because this survey is based on opinions and experiences from the public officials' own assessment, the survey results cannot avoid the respondents' bias. Some issues should be noted:

- The results reflect the respondents' personal views on innovation, not necessarily the entire situation of innovation capacity of the unit.
- Sample selection bias: the pilot survey sample reflects the network of the NIC, and the people interested in the NIC, so the results are only localized and not representative of the public sector in general or the MPI industry in particular. These units, according to the research team, have a little understanding of innovation or have been implementing innovation, so the results may be more

[29] The research team found that in question A3 asking about the type of innovation that the unit has implemented in the past 2 years, right after filling in personal information, the answers are only in a single form (the units only implemented one type of innovation instead of implementing many types of innovation at the same time) although the question clearly states "choose multiple options". It is not clear to the research team whether the units actually carried out only one type of innovation during the time period questioned or understood by the surveyors as "selecting only one option".

positive than reality. In addition, respondents tend to give more positive reviews because of the potential benefits NIC can offer them. Measures should be taken to limit these biases.

- Innovation is a complex practice, skill and process, so many people when starting out will fall into the trap of being more confident in their abilities than they actually are because they have not yet comprehended the full complexity of the journey (Dunning-Kruger effect).
- It is not excluded that public officials give a higher leadership rating than they actually are due to some concerns that if they give a low score or give a high score to benefit themselves, the assessment results on leadership traits may not illustrate a reflection of reality.

IV.3.2. Next steps

In order to realize the desire to have a set of indicators measuring the innovation status of the public sector, comparing between units and the improvement of each unit over time, the research team proposes the following ideas:

- Continue to study and supplement specific and specialized indicators of innovation in the public sector for sectors and fields at central and local levels.
- Ministries, branches, and provinces can apply the Criteria framework for measuring innovation in the public sector in this report to pilot assessment for their respective sectors and domains, as a basis for urging and promoting innovation of their units from 2023 onwards.
- Consider integrating the innovation index in the public sector into the Public Administration Reform Index (SIPAS) when there is no separate strategy for innovation in the public sector.

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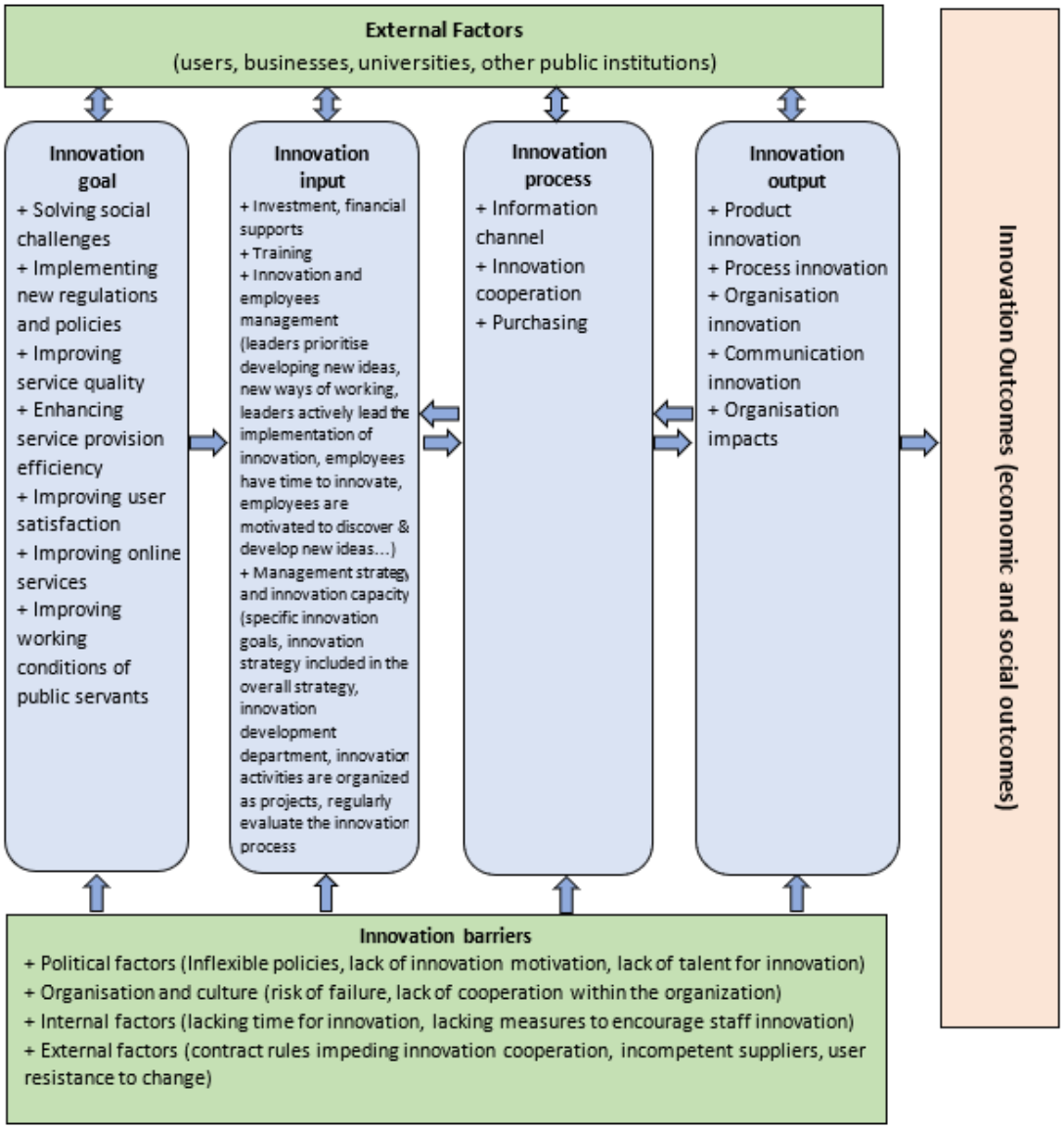
APPENDIX

Appendix 1: Some public sector innovation indexes in the world

1. Measuring Public Innovation in the Nordic Countries (MEPIN)

MEPIN researching project (Measuring public sector innovation in the Nordic countries) for public organizations of the Nordic countries in 2008-2009 was the first large-scale survey on innovation in the public sector. The objective of the project was to develop a measurement framework to collect internationally comparable data on innovation in the public sector, which increasing understanding of public innovation, how public institutions innovate, and to develop measurement promoting innovation in the public sector (Bloch, 2011). The pilot survey was conducted in 5 Nordic countries (Denmark, Finland, Iceland, Norway and Sweden.

Figure A1: Conceptual framework for innovation in public organizations of MEPIN



Source: Compiled from Bloch (2011) and Australian Government (2011)

The innovation approach in this study inherits and changes the OECD's definition of innovation for the private sector (Arundel et al., 2016)[30], in which the questionnaire is partly based on the Community Innovation Survey-CIS) for the business sector with some adjustments to the public sector (Bugge et al., 2011). Four types of innovation were surveyed: product innovation, process innovation, organizational innovation and communication innovation (for details on each type of innovation, see Bugge et al., 2011). The Nordic pilot studies were based on a harmonized approach, but there are some differences in actual implementation. All surveys are based on a common Nordic questionnaire[31] and sampled by central, regional and local public authorities. Survey subjects are heads or senior leaders.

The conceptual framework for public innovation is built on the idea that public organizations need to define their goals, invest in innovation activities and organize the innovation process. Innovation results are demonstrated through implemented innovations and a range of other potential outcomes. This process is influenced by many motivational factors and barriers. The model of innovation in public organizations is demonstrated in Figure 8.

2. UK Innovation in the public sector index (NESTA)

In 2010, the UK National Endowment for Science, Technology and the Arts (NESTA)[32] carried out a pilot study to build a public innovation index under the Innovation Index Program. The innovation index in the public sector is built on the basis of a survey approach, testing and measuring with national health service organizations and local authorities.

Figure A2: Innovation framework in public organization of the UK (NESTA)

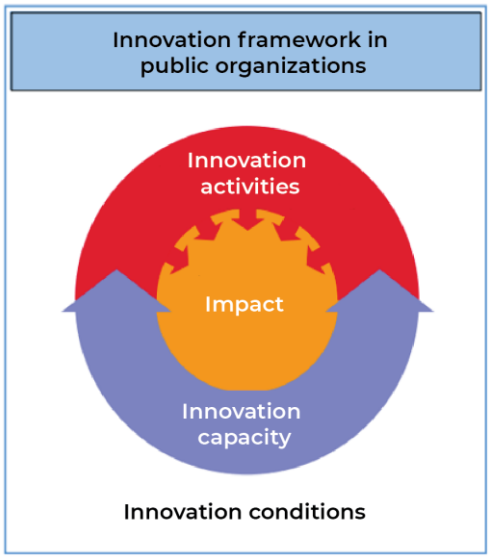
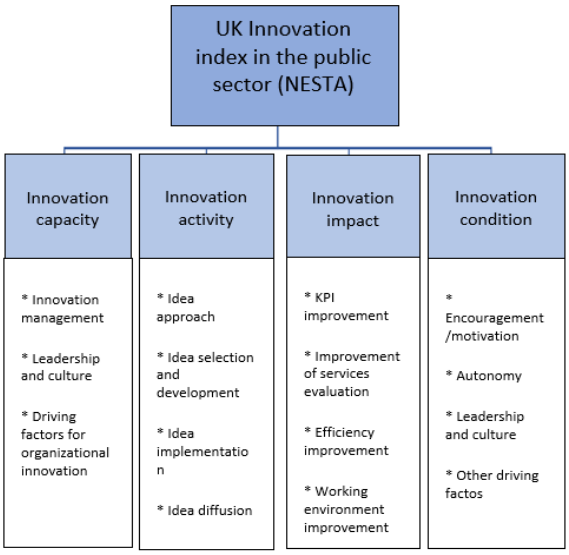


Figure A3: Pillars of the UK Public Innovation Index (NESTA)



[30] Based on previous studies on public innovation and insights on innovation measurement for the enterprise sector, it is found that it is not possible to measure innovation in the public sector using the same conceptual framework as measuring enterprise innovation. Although the difference is not fundamental and the general concept of innovation in the public sector is similar to that for business, the definitions and questions need to be different to reflect the specifics of the public sector (Australian Government, 2011).

[31] There are some exceptions for Finland

[32] The National Endowment for Science, Technology and the Arts

Source: Hughes et al. (2011)

The innovation framework in public organizations, built according to the innovation approach, is a process, consisting of 4 pillars: (1) Innovation activities, (2) Innovation capacity, (3) Innovation impacts on organizational activities and (4) Conditions for innovation (Figure 4). With the factors inside the organization (pillars (1), (2) and (3)), innovation capacity is the foundation for innovation activities and innovation activities affect the operation of enterprises. Innovation capacity describes an organization's capacity to affect innovation activities. Innovation activities describe an organization's flow of ideas and the effectiveness of related innovation activities. The impact of innovation describes the impact of innovation activities on an organization's operations in terms of outcomes, services, performance, and context for change. With factors outside the organization, the conditions for innovation describe the way in which the system in which the organization operates promotes or hinders innovation of the organization. Details of the indicators of each pillar are depicted in Figure A3. The specific classification of indicators is described in Table A1.

Table A1: Classification of indexes

Pillar	Target	Index
Innovation impacts	Improved key performance indexes	Improve KPIs
		The impact of these metrics on operating results
	Improve service evaluation	Improve service rating/Feedback from users
	Improve efficiency	Improve key efficiency/productivity metrics
	Improve working conditions	Working conditions to improve operations
Innovation activities	Approaching new ideas	Number and type of ideas
		Novelty
		Sources of ideas (general, internal, external)
	Selecting and developing ideas	Idea selection and development index
		Ideas selection
		Resource allocation
		Multidisciplinary field development
		Pilot/test ideas
	Implementing ideas	Idea Implementation Index
		Measure benefits
		Training

Pillar	Target	Index
	Spread the results	Popularize and share the results
Innovation capacity	Leadership and culture	Leadership and Culture Index
		Vision and spirit of senior managers
		Priority for innovation
		Level of risk taking and learning
		Pay attention to employee and service user feedback
		Space and capacity for creative thinking
		Leadership tenure
	Innovation management	Connect innovation goals and operational priorities
		Investment intensity
		Innovation management
		Involvement of senior employees
		Risk management
	Factors promoting organizational innovation	Information management
		The connection between departments in the organization
		Incentives and rewards
		Information and communication technology (ICT) infrastructure
		Quality of human resources
Conditions for innovation	Innovation encouragement /motivation	Index of encouraging innovation
		Requirement
		Competitions
		Operational goals
		Transparency of operations
		Responsibility to users (services)
		Recognition and reward
		Regulations
	Autonomy	Innovation responsibilities
		Flexibility in formulating organizational strategy
		Flexible budget
		Freedom to use rules and guidelines

Pillar	Target	Index
		Legal basis
	Leadership and culture	Vision and spirit of innovation
		Innovation activities are linked to the organization's strategy
		Pay attention to the feedback of service users, employees and middle management
		Attitude to cooperate with other agencies
		Focus on short/medium/long term goals
		Quality of new initiatives
	Other innovation-promoting factors	Access to transparent and comparable performance data
		Access to information on best practices in the public sector and private sector
		Access to funds and supports for innovation
		Access to shared structures and tools
		Sufficient IT system
		Review process
		Reward Program
		Learn from inspection/audit
		Measuring innovation

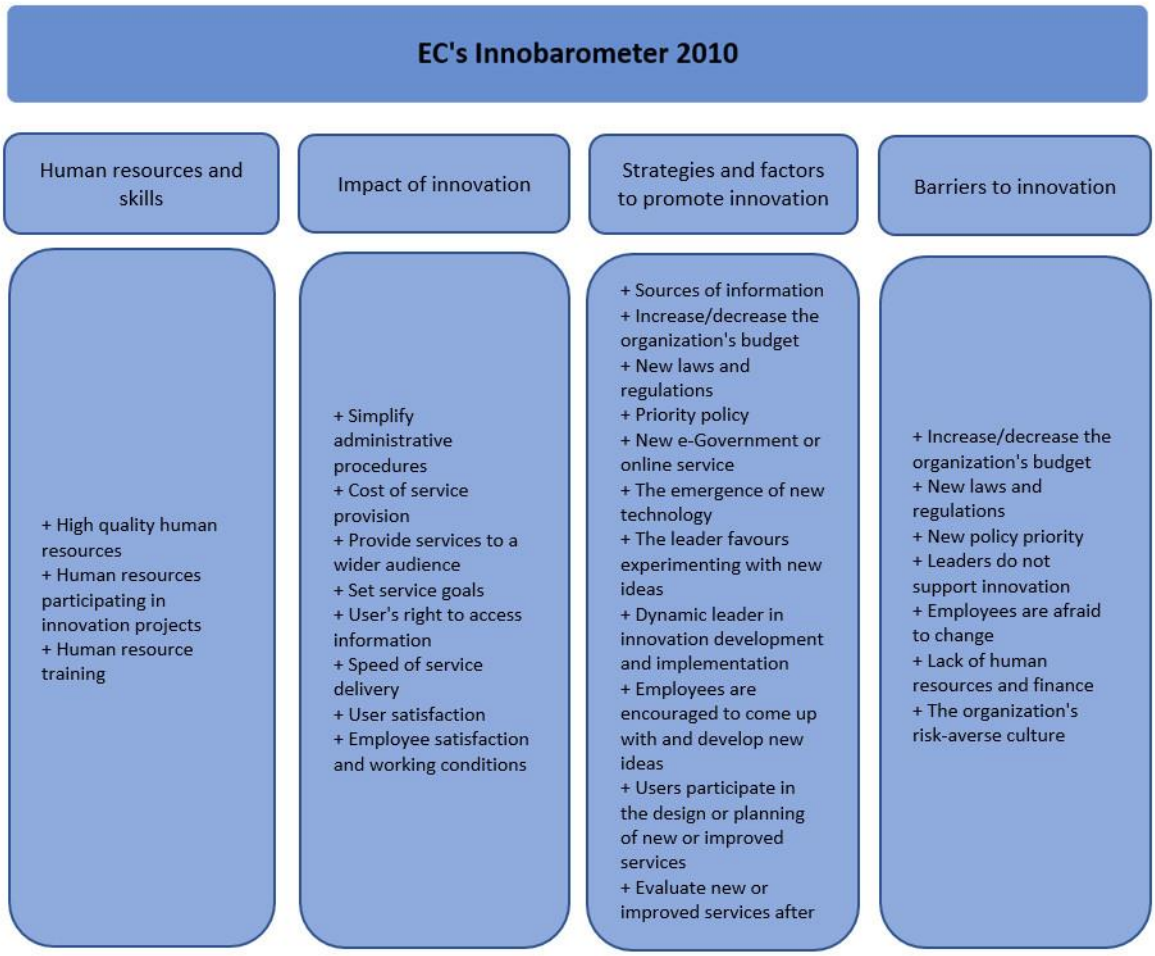
Source: Hughes et al. (2011)

3. The Innobarometer and Innovation barometer

In 2010, the 9th Innobarometer survey of the European Commission was conducted for 4063 public administrative organizations[33] in 27 European countries, Norway, and Switzerland to examine the innovation strategy of the European public administration sector in the face of changes in barriers and opportunities. Survey using object-based approach: Focusing on 1 type of innovation as a single and focus innovation; focus on innovation phenomena.

[33] The surveyed organizations have 10 or more employees.

Figure A4: Pillars of Innobarometer 2010



Source: Compiled from European Commission & The Gallup Organization (2011)

By 2014, the Innovation Barometer survey was conducted for Denmark and continued in 2017. In 2018, this survey was extended to Finland, Iceland, Norway, Sweden (the Nordic Innovation barometer) and in 2021 in the Netherlands (the Dutch Innovation barometer). Like the Innobarometer survey, the Innovation Barometer survey and similar surveys used an object-based approach in the sense of surveying the latest type of innovation. Similar to the definition of innovation in MEPIN's survey, in the Innovation Barometer's survey, innovation includes 4 types: organizational innovation, service innovation, product innovation and communication innovation.

4. Australia Public Sector Innovation Indicator (APSII)

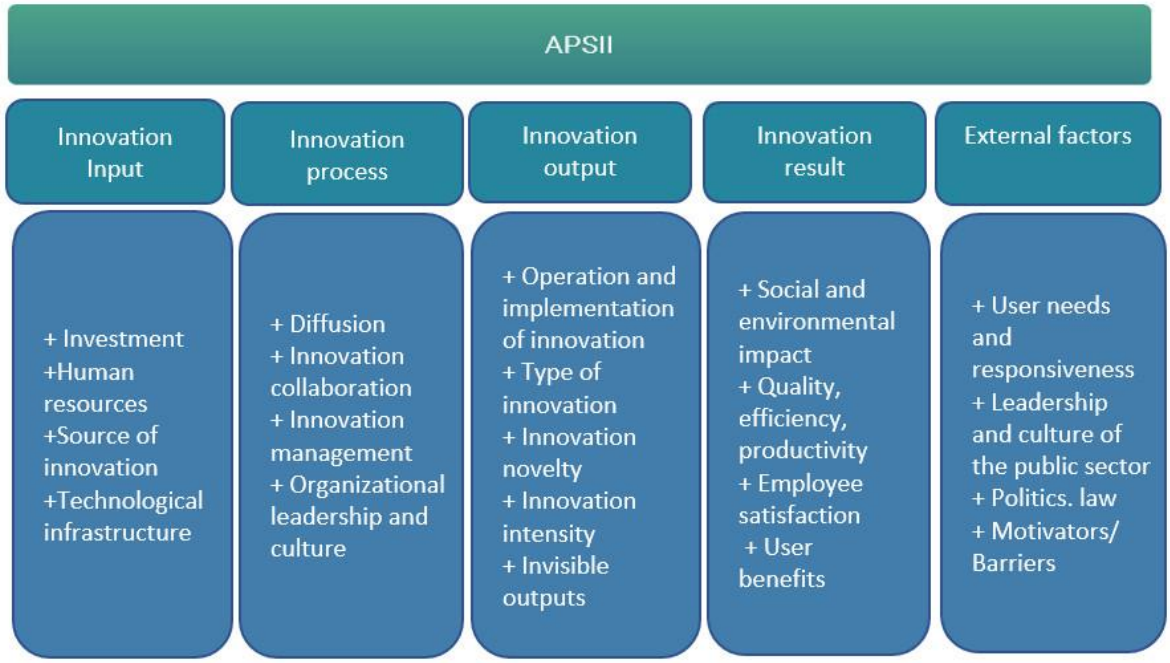
The Australian Public Sector Innovation Indicators project was initiated by the Department of Industry, Innovation, Science and Research (DIISR) and was supported by the Australia Innovation in the Public Sector (APS 2000) approved at the end of 2010. By the end of 2011, the project had developed a conceptual framework and a measurement framework and conducted a pilot survey with 344 employees from 15% of APS functional units in August of 2012.

APSII was designed to: (i) Provide a self-assessment tool for public agencies to assess their innovation activities and capabilities; (ii) Comparing public agencies and groups of agencies; (iii) Assessing

innovation in Australia's public sector compared to other countries; and (iv) Raising awareness, understanding, and promoting innovation in public institutions (Australian Government, 2011).

In this survey, innovation, at its most effective, "is an ongoing process that can lead to new services or new modes of service delivery, the development of new concepts, new policy approaches or new administration and new system". Innovation is considered a process, including 5 steps: idea generation, idea selection, idea implementation, maintenance of new methods and dissemination of new methods. Accordingly, the conceptual framework of APSII consists of 5 pillars: Innovation Input, Innovation Process, Innovation Output, Innovation result and External Factors. Corresponding to each pillar are indicators, demonstrated in Figure A5.

Figure A5: The APSII Conceptual Framework



Source: Sandor (2018)

The results of the pilot survey in 2012 are the basis for editing the questionnaire in June 2013.

5. European Public Sector Innovation Scoreboard (EPSIS)

EPSIS pilot project EPSIS in 2013 was the first EU-wide effort to better understand and analyse innovation in the public sector. It was developed based on the experience of previous national and regional projects, extensively tested and discussed with a number of key relevant experts.

EPSIS is based on the APSII conceptual framework, including 5 main pillars: Innovation input, Innovation process, Innovation output, Innovation outcome and Environmental conditions affecting innovation in the public sector. From there, EPSIS has 3 main pillars: Enablers, Activities and Outputs. In which, the impact of innovation is included in the Output pillar of EPSIS.

Table A2: Components of EPSIS 2013

Element		Measure
Enablers	*Human resources*	% of work related to creativity
		% of employees in the public administration with a university degree
	Quality of public service	Government efficiency
		Policy quality
		How effective is the improvement of public service quality through the use of ICT
		Availability of electronic public services
		E-Government Development Index (EGDI)
Activities	*Capacities*	% of service innovators implementing innovation within the organization
		% of process innovators implementing innovation within the organization
	Drivers and Barriers	The importance of internal barriers to innovation activities
		The importance of external barriers to innovation activities
		Active participation of management in innovation
		The importance of external knowledge
		% of personnel participating in groups holding regular meetings to develop innovation
Output	*Innovators*	% of organizations in public administration that innovate in service, communication, process or organization
		% of "new" services among innovation services
		Productivity of the public sector
	Impact on business performance	Improving public services for businesses
		The impact of public service improvements on businesses
	Public procurement	Public procurement as a driver of business innovation
		Public procurement of advanced technology products
		The importance of innovation in public procurement

6. Korean Government Innovation Index (GII)

Government Innovation Index (GII) is an online innovation measurement tool launched by the Government Innovation Headquarters under the Korean Ministry of Government and Home Affairs in

2005. GII was designed to measure innovation in government agencies, focusing on a range of innovation management components, including: innovation leadership; vision and strategy; personnel capacity; innovation implementation; performance improvement; innovation barriers. GII was one of the earliest sets of indicators to be implemented and released since it has provided important hints in the implementation process for subsequent sets of indicators around the world (Kattel et al., 2018).

This set of indexes only focuses on certain inputs for the innovation process, factors that facilitate and impacts innovation, while measuring innovation results somewhat omitted.

- Innovation inputs
    - R&D activities (e.g. innovation or R&D unit; dedicated strategic unit; spending on market or consumer research; spending on innovation development and implementation);
    - Consulting and strategic alliances (e.g. Joint venture number; consulting fees; university partnership programs);
    - Intangible assets (e.g. patents; intellectual property rights development activities; entity responsible for intellectual property rights; trademarks);
    - ICT infrastructure;
    - Human resources (e.g., staff with graduate degrees; job satisfaction; performance-based promotion system; personnel turnover; so on.)
- Innovation activities/processes
    - Organizational performance (e.g. percentage of goals achieved; average time to deliver outputs; changes to programs in place; awards and rewards for initiatives, etc.)
    - E-government, online services (rate of service requested online; rate of service provided online);
    - Origin of innovation (e.g. how much: innovation is due to EU regulations; innovation is the result of ministerial/government proposals; client proposals; proposals management export).
- Innovation Outputs: Number of initiatives developed to provide new outputs; the number of innovations that improve existing outputs; the overall amount of innovation; New results;
- Innovation impacts: Number of innovations connected with other public institutions; number of performance improvement initiatives; Number of people who have been affected by innovations introduced in the public organization to provide new or existing outputs. (Kattel et al., 2018).

The data collection process required three representatives from randomly selected agencies to answer an online questionnaire through a web-based assessment system that could calculate and analyze data. Three representatives of the agency responded to the question including 1 innovation plan manager in the surveyed organization, the other 2 were random 2 people selected to answer questions to verify the verified information. These two were connected through a phone interview.

7. Dubai Government Innovation Framework (DGI)

Dubai Government has developed an Innovation Framework that all government agencies can adopt and use as a reference in their journey to becoming high-performing, innovative organizations. (Dubai Government Innovation Framework). Global Innovation Management Institute (GIMI) certifies that the Dubai Government Innovation Framework, fully developed in this Body of Knowledge, presents all

components, tools and methods approach needed to equip their agencies with a top-level structure and achieve innovative results.

Dubai Government Excellence program has developed a Government-wide innovation framework in Dubai, demonstrating the willingness of government entities to achieve world-class innovation and make the Government of Dubai the one of the most innovative agencies and innovative governments in the world. The index is based on a work innovation framework that includes key elements for enhancing a culture of innovation in government agencies. The government innovation index will be used as one of the indicators in the results of the Innovation Management criteria in the Government Excellence Model in Dubai.

The Dubai Government Innovation Framework is a guiding model to show the key elements needed to achieve government innovation and to demonstrate the relationship of all factors at the entity level. and government level. The Innovation Framework was developed to assist government agencies in Dubai to adopt and promote a culture of innovation and to maintain performance and excellent results.

This Innovation Index is designed to: (1) Achieving the goals of the Dubai Government's Program of Excellence as a global hub of innovation and knowledge, and to make the Government of Dubai a one of the most innovative and innovative Government in the world; (2) Provide a methodology for measuring willingness to innovate that will assist government organizations for continual improvement; (3) Spreading a culture of creativity and innovation in government agencies and (4) Providing tools for local marking at the local and international level. The Dubai Government Innovation Index consists of six pillars, described in Table A3.

Table A3: Dubai Government Innovation Index

Pillar	Elements
Leadership & Innovation Strategy	Leadership Components Strategy and areas of focus
Innovation Culture	Values and work culture Change management and failure and risk tolerance Motivation and Recognition
Innovation Management	Managing innovation and stakeholders Innovation management system
Innovation Enablers & Organizational Learning	Factors driving innovation Learning organization
Partnership & Networks	Contact stakeholders A win-win cooperation relationship
Innovation Results & Impact	Progress and Process Indicators Impact index

- **Pillar 1: Leadership and innovation strategy:** The Leadership and Innovation Strategy refers to the role of an organization's leadership team to support, promote, and provide the right structure for effective innovation. at all levels of the organization. The role of the leadership team is to motivate, sponsor and support the innovators in their efforts to reach the level of becoming an “Innovation Organization”.
- **Pillar 2: Innovation cculture**: The cultural element refers to the importance of innovation that is embedded in culture at all levels of the entity. This can be achieved through spreading values and creating an environment that fosters innovative thinking and encourages continuous improvement. An organization with an innovation culture is an organization that promotes and supports people to adopt the values of continuous improvement, R&D and innovation. Members are empowered through enhancing their capabilities and given the right tools and responsibilities to be innovative at all levels of the organization.
- **Pillar 3: Innovation management:** Management systems help organizations become effective in applying new ideas and putting them into practice to achieve targeted results. The Innovation Management Element refers to the extent to which mechanisms for continuous improvement and adaptation to internal and external variables are in place, while also collaborating with different stakeholders in the design phases, development and implementation of new projects.
- **Pillar 4: Innovation enablers and organizational learning:** Innovation tools, techniques and principles can help organizations achieve innovative results faster, cheaper and more efficiently. These can be disseminated across the entire entity through organizational learning methods to build internal capacity for innovation. If done properly, this effort can help keep the organization running and make use of the necessary financial, physical and technological resources.
- **Pillar 5: Partnership and networks:** Collaboration and connectivity refers to the degree of cooperation with various stakeholders, both internal and external, including research institutes, universities, centers of scientific research and international organizations, start-ups & global companies, aiming to achieve innovative solutions to the challenges facing the entity.
- **Pillar 6: Innovation results and impact:** Metrics can be divided into two categories, impact measures and actual results obtained from innovation efforts and indicators supporting to achieve results by tracking innovation and internally made progress on culture, stakeholder engagement, capacity and skills development.

8. Global Innovation Index (GII)

The Global Innovation Index (GII) is researched and published by WIPO. The idea for the suite was introduced by the European Institute of Business Administration (INSEAD) in 2007, with the sole goal of determining how to obtain metrics and approaches that would allow for a better grasp of the level of innovation and the effectiveness of the innovation system of countries and economies.

Global Innovation Index is an index that evaluates the innovation ecosystem of 132 economies around the world and provides global innovation trends. GII also points out strengths and weaknesses for innovation development of each country and territory. The set of indicators includes about 80 indicators, including data on the political environment, education, infrastructure and education of

each economy. The highlight of the GII is the comparison of the innovation index between economies in the same region or income group.

GII is based on two sub-indices: (1) Innovation Input Sub-Index and (2) Innovation Output Sub-Index, where each indicator is built on pillars. The innovation input sub-index comprises the five pillars of the input index that captures the elements of the national economy that enable innovative activities. The innovation output sub-index includes the results of innovation activities in the economy. Although the Output Sub-Index consists of only two pillars, it is weighted in the same way in the calculation of the overall GII score as the Input Sub-Index.

Pillar 1 - Institutions: The Institutional Pillar refers to the institutional framework of a country, including the political environment, legal environment, and business environment. The political environment consists of two indicators: one that reflects the perception of the potential for government instability; and one that reflects the quality of public and civil services, policy formulation and implementation. The regulatory environment is based on two indicators that capture perceptions of government's ability to formulate and implement coherent policies that promote private sector development and assess the extent to which the state the rule of law prevails (in such aspects as enforcement of contracts, property rights, police and courts). The business climate expands on three dimensions that directly affect private entrepreneurial endeavours using the World Bank's indicators of ease of starting a business; ease of settlement of insolvency (based on recorded recovery rates as cents to dollars recovered by creditors through reorganization, liquidation or enforcement/foreclosure proceedings); and easy to pay taxes.

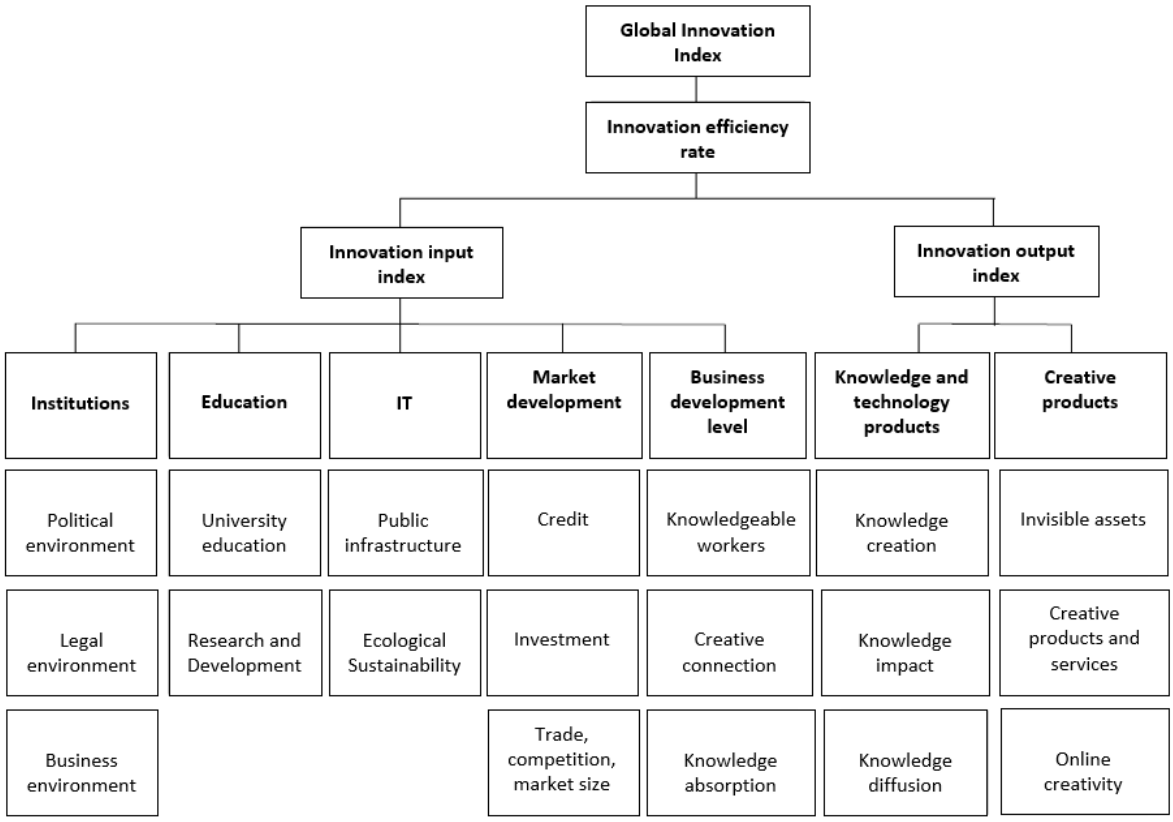
Pillar 2 - Human resources and research: The level and standards of education and research in a country are the primary determinants of a country's capacity to innovate. This pillar measures the human capital of countries. This pillar consists of three parts: Education, higher education, and research and development.

Pillar 3 - Infrastructure: The third pillar consists of three sub-pillars: Information and Communication Technology (ICT), Common Infrastructure and Eco-Sustainability. The Information and Communication Technology sub-pillar includes four indicators developed by international organizations on ICT access, ICT use, online government services, and citizen online participation. General infrastructure includes electricity output kWh/capita, logistics efficiency, total capital formation (% GDP).

Pillar 4 - Market development: Availability of credit and an enabling investment environment, access to international markets, competition and market size are all important factors for Businesses thrive and innovation happens. The Market Development Pillar has three sub-pillars that revolve around market conditions and the total volume of transactions, namely credit, investment and trade, competition, and market size.

Pillar 5 - Business development level: This pillar studies the development level of enterprises to assess the ease of companies in innovation activities. The Human Resources and Research Pillar (Pillar 2) has shown that the accumulation of human capital through education, especially higher education and prioritizing R&D activities, is an indispensable condition. to make innovation. That logic is taken a step further here with the assertion that businesses boost their productivity, competitiveness and innovation potential by employing highly qualified professionals and technicians. This pillar includes 3 sub-pillars: knowledge labour, creative association and knowledge absorption.

Figure A6: Components of the Global Innovation Index



Pillar 6 - Products of knowledge and technology: This pillar includes all variations that are believed to be the result of inventions or improvements. The first sub-pillar refers to the generation of knowledge as a result of creative and innovative activities. The second sub-pillar, on knowledge impact, includes statistics that reflect the impact of innovation activities at the micro- and macro-economic level or related mandates. The third sub-pillar, on knowledge diffusion, is a mirror image of pillar 5's knowledge-absorption sub-pillar, related to areas with high technology content or key to innovation.

Pillar 7 - Innovative Product: The last pillar, creative product, consists of three sub-pillars. The first sub-pillar of intangible assets includes trademarks, industrial designs, organizational and business models. The second sub-pillar, innovative products and services, includes information services, advertising, market research and opinion polls, as well as other personal, cultural and entertainment services. The rest of the sub-pillars are national feature films produced, publication volume, and exports of creative goods, all of which aim to give an overall sense of the international scope of domestic creativity. The third sub-pillar of online creativity includes generic domains (biz, info, org, net and com) and country-code top-level domains, monthly edits to Wikipedia; and upload videos on YouTube.

Appendix 2: The pilot survey's PSII result

PSII Composite Index	Ministry	Province
Content index 1: Innovation input		
1.1.Human		
Percentage of respondents who said that the unit has an assigned person to propose and implement innovation (%)	18.8	37.5
Percentage of human resources able to propose and/or implement innovation (%)	86.4	60.0
Innovation project management skills of public servants (1= Weak; 2=Average; 3=Excellent; 4= Fairly good; 5=Good)	4.00	3.53
Skills in exploring, learning and discovering new ideas and new approaches of public servants (1= Weak; 2=Average; 3=Good; 4= Fairly good; 5=Good)	4.32	3.87
The ability of public officials to perform new tests (1= Weak; 2=Average; 3=Excellent; 4= Fairly good; 5=Good)	3.91	3.40
The spirit of public officials dare to think, dare to do, dare to take risks of public officials (1= Weak; 2=Average; 3=Good; 4= Fairly good; 5=Good)	3.86	3.20
Data collection, synthesis and analysis skills of public servants (1= Weak; 2=Medium; 3=Excellent; 4= Fairly good; 5=Good)	4.45	3.67
Cooperation skills and consultation with experts, domestic and foreign organizations of civil servants (1= Weak; 2=Average; 3=Good; 4= Fairly good; 5=Good)	4.27	3.53
Ability to research, review and assess user needs of public servants (1= Weak; 2=Medium; 3=Good; 4= Fairly good; 5=Good)	4.10	3.57
The ability to guide, advise, and share experiences for other cadres and civil servants (1= Weak; 2=Average; 3=Excellent; 4= Fairly good; 5=Good)	3.91	3.93
Creativity in the work of public servants (1= Weak; 2=Average; 3=Excellent; 4= Fairly good; 5=Good)	4.00	3.71
Percentage of training units on skills to propose and implement innovation for public employees in the past 2 years (%)	54.5	53.3
1.2. Finance/Budget for innovation		

PSII Composite Index	Ministry	Province
Percentage of respondents who said that the unit has a separate budget for innovation (%)	31.8	20.0
Percentage of respondents who said that the unit face financial difficulties when investing in innovation activities (%)	13.6	60.0
Percentage of respondents who said that the unit receive support to implement innovation from external entities in the last 2 years (%)	45.5	23.1
Percentage of respondents who said that the unit implement public investment in innovation in the last 2 years (%)	22.7	13.3
Total amount of investment for innovation in the latest year		
1.3. Infrastructure		
Availability of information technology (IT) machinery and equipment for innovation activities (1=Agree; 2=Partly agree; 3=Disagree)	1.67	1.86
IT machinery and equipment for innovation at an advanced level of the unit (1=Agree; 2=Partly agree; 3=Disagree)	2.14	2.07
Percentage respondents who said that the unit has technology infrastructure to support innovation activities (%)	59.1	60.0
1.4. Policy		
Percentage of managers asked to know about innovation documents related to the unit (%)	60	80
Percentage of respondents issuing regulations on innovation (%)	50	26.7
Percentage of respondents implementing innovation according to regulations and policies (%)	13.6	13.3
The degree of influence of policies for innovation on innovation activities in the unit (3= Positive; 2=None; 1=Negative)	3	3
Complexity of processes and procedures when conducting innovation in the unit (1= Very complicated; 2= Complex; 3=Fast, flexible)	2.79	2.69
The importance of administrative reform in promoting innovation implementation (1=Low; 2=Medium; 3=High)	2.23	2.73

PSII Composite Index	Ministry	Province
The importance of implementing e-Government in promoting innovation implementation units (1=Low; 2=Medium; 3=High)	2.64	2.80
The importance of newly issued policies in promoting innovation implementation units (1=Low; 2=Medium; 3=High)	2.55	2.67
Importance of documents and directives on implementation of new online services in promoting innovation implementation units (1=Low; 2=Medium; 3=High)	2.73	2.87
Content index 2: Innovation capacity		
2.1. Leadership traits		
The leader has experiences in innovation (1= Lowest and 10= Highest)	8.23	5.80
The leader creates conditions for development and encourage innovation, applying new ideas (1= Lowest and 10=Highest)	8.27	7.20
The leader actively directs the implementation of innovation (1= Lowest and 10=Highest)	8.55	7.20
The leader supports testing new ideas (1= Lowest and 10=Highest)	8.18	6.93
2.2. Organizational culture		
Level of incentive to discover, propose and implement new ideas of the unit (1= Lowest and 10=Highest)	8.15	7.25
Level of encouragement of innovation activities in the unit (1= Lowest and 10=Highest)	8.30	7.17
Level of priority for innovation in the unit (1= Lowest and 10=Highest)	8.35	6.58
Level of acceptance and willingness to change/innovation by public officials (1= Lowest and 10=Highest)	8.10	6.08
2.3. Innovation Strategy		
Percentage of respondents who said their unit has specific strategies for innovation (%)	68.2	35.7
Percentage of respondents who said their unit has long-term strategies for innovation (%)	13.6	9.1
Percentage of respondents who said their unit has medium-term strategies for innovation (%)	59.1	13.6

PSII Composite Index	Ministry	Province
Percentage of respondents who said their unit has short-term strategies for innovation (%)	4.5	
2.4. Innovation motivation		
Percentage of respondents who are motivated to generate new ideas and participate in the development of new ideas (%)	81.8	86.7
Percentage of respondents who generate new ideas and participate in the development of new ideas due to individual curiosity and inquisitiveness (%)	54.5	13.3
Percentage of respondents who are motivated to create new ideas and participate in the development of new ideas because they want to improve work efficiency (%)	77.3	80.0
Percentage of respondents who are motivated to generate new ideas and participate in the development of new ideas due to incentives from the unit (%)	27.3	26.7
2.5. Innovation management		
Innovation to improve efficiency and effectiveness (1=Lowest; 5=Maximum)	4.3	3.7
Risk management related to innovation activities (1= Lowest; 5=Maximum)	3.8	3.5
Content index 3: Innovation process		
3.1. Approach, select, develop and implement new ideas		
Number of innovation ideas recorded at the unit in the past year (.....ideas)	4.4	5
Percentage of respondents who said their units have a system to evaluate and develop ideas of public servants (%)	33.3	33.3
Percentage of respondents who said their units have information sources from departments and agencies have a great influence on their innovation (%)	57.1	73.3
Percentage of respondents believe that information sources from other government agencies and other provincial agencies have a great influence on their innovation (%)	66.7	73.3

PSII Composite Index	Ministry	Province
Percentage of respondents who believe that information sources from professional organizations have a great influence on their innovation (%)	33.3	46.7
Percentage of respondents who believe that information from seminars has a great influence on their innovation (%)	81.0	73.3
Percentage of respondents who believe that information sources from enterprises, business associations, and consultants have a great influence on their innovation (%)	90.5	86.7
Percentage of respondents who believe that information sources from non-profit/non-governmental organizations have a great influence on their innovation (%)	19.0	26.7
Percentage of respondents who believe that people's feedback has a great influence on their innovation (%)	47.6	60.0
Percentage of respondents who believe that information sources from universities and public research organizations have a great influence on their innovation (%)	38.1	40.0
Percentage of respondents who believe that foreign information sources have a great influence on their innovation (%)	23.8	20.0
The rate of needs assessment of service beneficiaries is an important source of ideas affecting the innovation of the unit.	76.2	64.3
Rate of assessment of ministry leadership is an important source of ideas affecting innovation of the unit	61.9	64.3
The rate of assessment of unit leaders is an important source of ideas affecting the innovation of the unit	61.9	71.4
Rate of evaluation of superior units is an important source of ideas affecting innovation of the unit	33.3	57.1
The rate of assessment of public officials and public servants at the unit is an important source of ideas affecting the innovation of the unit	57.1	42.9
Rate of assessment of inadequacies or ideas appearing in the management process is an important source of ideas affecting the innovation of the unit.	61.9	50.0
Percentage of respondents who believe that their units spend financial resources on idea selection, development and implementation (%)	47.6	41.7

PSII Composite Index	Ministry	Province
The number of ideas developed into an innovation project and piloted is 1 unit in the last 2 years	1.9	2.8
3.2. Innovation collaboration		
Percentage of respondents who said that their units cooperate with other units in the process of innovation implementation (%)	81.0	66.7
Percentage of respondents who said that their units cooperate with other ministries and ministerial-level agencies (%)	57.1	33.3
Percentage of respondents who said that their units cooperate with provincial agencies (%)	38.1	58.3
Percentage of respondents who said that their units cooperate with other government agencies (%)	19.0	25.0
Percentage of respondents who said that their units cooperate with higher education institutions and research institutes (%)	14.3	41.7
Percentage of respondents who said that their units cooperate with organizations/associations (%)	33.3	33.3
Percentage of respondents who said that their units cooperate with other organizations (%)	33.3	
The level of cooperation within the unit for innovation (1= Lowest; 5= The most)	4.3	3.6
The level of cooperation with other units for innovation (1= Lowest; 5= The most)	4.3	3.1
3.3. Innovation diffusion		
Percentage of respondents who said that their units have disseminated/shared innovation results they have developed so that other places can apply	50	53.3
Percentage of respondents who said that their units diffuse innovation results on websites and newsletters (%)	50.0	46.7
Percentage of respondents who said that their units diffuse innovation results through conferences and seminars (%)	45.5	33.3
Percentage of respondents who said that their units diffuse innovation results on newspapers, radio and social networks (%)	40.9	40.0
Percentage of respondents who said that their units diffuse innovation results through seminars (%)	40.9	33.3

PSII Composite Index	Ministry	Province
3.4. Innovation assessment		
Percentage of respondents who said that their units evaluate innovation results in the past 2 years (%)	65.0	66.7
Percentage of respondents who said that their units have plans to evaluate innovation results in the past 2 years but have not yet implemented them (%)	10.0	-
Percentage of respondents who said that their units self-assess through the survey of innovation beneficiaries	53.8	90.0
Percentage of respondents who said that their units assess through professional rating units	46.2	10.0
Content index 4: Innovation output		
4.1. Product and service innovation		
Percentage of respondents who said that their units have product and service innovation (%)	36.4	26.7
Percentage of respondents who said that their units have internal software (%)	37.5	100
Percentage of respondents who said that their units have a "common" service to share resources or reduce duplication across branches, departments or agencies (%)	75	50
Percentage of respondents who said that their units provide services to people or businesses, including online services (%)	50	50
Percentage of products and services introduced/developed first by the unit (%)	57.1	25.0
Percentage of products and services inspired by other units/departments and changed accordingly (%)	14.3	25.0
Percentage of products and services that are duplicates of solutions of another unit/department (%)	14.3	50.0
Percentage of respondents who said that their units have online public services at 1	28.6	0.0
Percentage of respondents who said that their units have online public services at 2	28.6	0.0
Percentage of respondents who said that their units have online public services at 3	0.0	25.0

PSII Composite Index	Ministry	Province
Percentage of respondents who said that their units have online public services at 4	42.9	75.0
The implementation of the above products and services helps to increase publicity and transparency (1= Low, 5= High).	4.86	3.75
The implementation of the above products and services helps to shorten the service delivery time (1=Low, 5=High)	4.29	3.75
The implementation of the above products and services helps to increase the volume of services provided (1= Low, 5= High).	4.83	3.75
The implementation of the above products and services helps to increase the satisfaction level of users of products and services (1= Low, 5= High).	4.57	3.75
4.2. Process innovation		
Percentage of respondents who said that their units have process innovation (%)	54.5	60.0
Percentage of respondents who said that their units have a new or significantly changed product or service delivery process (%)	58.3	44.4
Percentage of respondents who said that their units have new or significantly changed support activities (maintenance, procurement, accounting, etc.)	25.0	11.1
Percentage of respondents who said that their units have new or significantly changed organizational or decision-making methods (%)	25.0	33.3
Percentage of respondents who said that their units have new or significantly changed systems for collecting, managing, and analyzing knowledge and information (%)	41.7	22.2
Percentage of respondents who said that their units have an education and training system for new or significantly changed employees and managers (%)	8.3	11.1
Rate of process innovation first introduced/developed by the entity (%)	72.7	28.6
Rate of process innovation inspired by other units/departments and changed accordingly (%)	18.2	14.3

PSII Composite Index	Ministry	Province
Process innovation rate that is a solution copy of another unit/department (%)	9.1	42.9
The implementation of the above processes helps to simplify administrative procedures (1=Low, 5=High)	4.36	3.88
The implementation of the above processes helps to increase the processing speed (1=Low, 5=High)	4.36	4.25
The implementation of the above processes helps to increase work efficiency (1= Low, 5= High)	4.36	4.33
The implementation of the above processes helps to save costs	3.91	4.38
4.3. Innovation of communication methods		
Percentage of respondents who said that their units have innovative communication methods in the past 2 years (%)	0.0	6.7
Percentage of respondents who said that their units have a new or improved method of promoting an organization or service (%)	There is only 1 provincial-level unit answering this item, so the calculation results have no reference value	
Percentage of respondents who said that their units have new or improved methods of promoting advice and guidance (%)		
Percentage of respondents who said that their units have new or improved internal methods of promoting innovation (%)		
Percentage of communication method innovation rate first introduced/developed by the unit (%)		
Percentage of communication method innovation inspired by other units/departments and changed accordingly (%)		
Rate of innovation in communication method that is a copy of another unit/department's solution (%)		
The implementation of the above communication methods helps to raise people's awareness (1=Low, 5=High)		
The implementation of the above communication methods helps to increase the percentage of users (1=Low, 5=High)		
The implementation of the above communication methods helps people/businesses know about the public services that the unit provides (1=Low, 5=High)		
4.4. Policy innovation		

PSII Composite Index	Ministry	Province
Percentage of respondents who said that their units have innovation policy in the past 2 years (%)	9.1	6.7
Percentage of respondents who said that their units implement government policy initiatives (%)	There are only 2 ministerial-level units and 1 provincial-level unit answering this item, so the calculation results have no reference value.	
Percentage of respondents who said that their units develop new or significantly changed strategies (%)		
Percentage of policy innovation first introduced/developed by the entity (%)		
Percentage of policy innovation inspired by other units/departments and changed accordingly (%)		
Policy innovation rate is a solution copy of another unit/department (%)		
The implementation of the above policies serves the implementation of the guidelines and policies of the Government (1= Low, 5= High).		
The implementation of the above policies serves the implementation of interdisciplinary policies and strategies, involving many units (1= Low, 5= High).		