Innovation capacity in local government organizations: a comparative case study of three innovation labs in the U.S

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Innovation Capacity in Local Government Organizations: A Comparative Case Study of Three Innovation Labs in the U.S.

by

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ABSTRACT

Innovation in the public sector is a high priority on the agenda of both practitioners and academics, as government recently faces increasing citizens’ demands and growing wicked problems. It has been increasingly regarded as necessary to improve current practices that improve government performance in terms of efficiency, effectiveness, and equity. In response to this demand for innovation, many government organizations established innovation labs to strengthen their capacity to introduce new and innovative solutions. Being agile and small and having a certain level of autonomy, they are advocated as a “safe space” that applies a variety of approaches, methods, and toolkits to help introduce new ideas and solutions without disrupting the traditional bureaucratic structure.

Innovation labs have only begun to receive attention from scholars in public administration and most of them have described innovation labs’ features and how labs conduct innovation projects. Studies about innovation labs have not thoroughly explored what determines innovation capacity in the labs to further achieve public sector innovation. To address the knowledge gap, this study aims to explore the following research question: What are the key determinants of innovation capacity in innovation labs?

To explore the research question, the study develops a conceptual framework of innovation capacity that identifies determinants in the four dimensions (i.e., resources, management, collaboration, and knowledge and learning). Further, the study examined these determinants through a multiple-case study of three innovation labs in the U.S.: (1) Boston Mayor’s Office of New Urban Mechanics (MONUM), (2) Seattle Innovation and Performance Office (IP), and (3) Minneapolis Office of Performance and Innovation (OPI). Embedded in the three cities with similar demographic characteristics, political party, and form of government, the three
innovation labs were selected as comparable cases to understand the similarities and differences in the determinants of innovation capacity in the innovation labs. I collected relevant documents including the official website, news reports, and blogs to understand the features, activities, and impacts of those labs. Forty semi-structured interviews in total were conducted with three groups of actors, (1) staff in the innovation lab, (2) public sector employees in the local governments, and (3) external partners in the innovation projects.

The multiple-case study identifies key determinants in four dimensions that are critical to innovation capacity within the innovation labs. First, resources determinants such as a multidisciplinary team of lab staff with a flexibility to use funding for innovation increase innovation capacity in the labs. Second, a committed lab leader cultivating a risk-taking culture allows lab staff to break away from stability and predictability to generate new ideas in innovation labs. Third, collaboration with both internal and external actors, especially with research institute or non-profit actors, enhances innovation capacity in the innovation labs by providing various information, knowledge, and resources. Fourth, having a learning orientation and absorbing knowledge increases diverse knowledge and perspectives for identifying new changes in the city government. The use of information technology seems to only matter in the city with advantages in technology. A proven method or technique of innovation seems matter more to gain labs’ credibility for innovation in a context lack of political sponsors. The study makes contributions to the literature about innovation capacity in government organizations by examining key determinants in a structured and comprehensive way. It makes contribution to understanding the importance of those determinants, the interaction among them, and their effects in the early stages of the innovation process.
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TABLE OF CONTENTS

ABSTRACT .................................................................................................................................................. ii
ACKNOWLEDGMENTS ........................................................................................................................... iv
LIST OF FIGURES ................................................................................................................................... viii
LIST OF TABLES ....................................................................................................................................... ix
CHAPTER ONE INTRODUCTION ............................................................................................................ 1
CHAPTER TWO LITERATURE REVIEW ................................................................................................ 9
  1. Innovation Capacity in an Organization ........................................................................................................ 9
     1.1 Definition of innovation capacity ........................................................................................................ 9
     1.2 Innovation capacity in government organizations ........................................................................ 12
     1.3 Determinants of innovation capacity ................................................................................................. 16
  2. Innovation Labs in the Public Sector ........................................................................................................ 43
     2.1 Definition of Innovation Labs ........................................................................................................... 43
     2.2 Purpose of Innovation Labs in the Public Sector ............................................................................ 45
     2.3 Characteristics of Innovation Labs in the Public Sector ................................................................ 48
     2.4 Innovation Capacity in Innovation Labs .......................................................................................... 53
CHAPTER THREE METHODOLOGY AND RESEARCH DESIGN ..................................................... 58
  1. Epistemology and Methodology ............................................................................................................ 58
  2. Research Design: Multiple Case Study .................................................................................................... 59
  3. Case Identification and Selection ........................................................................................................ 61
  4. Operationalization and Coding Scheme ................................................................................................. 66
  5. Data Collection ................................................................................................................................... 68
     5.1 Document collection ........................................................................................................................ 68
     5.2 Semi-structure interviews ................................................................................................................. 70
  6. Data Analysis ...................................................................................................................................... 74
     6.1 Within-case analysis ......................................................................................................................... 74
     6.2 Cross-case comparison ..................................................................................................................... 78
  7. Research Validity and Limitation .......................................................................................................... 80
CHAPTER FOUR THE MAYOR’S OFFICE OF NEW URBAN MECHANICS (MONUM) IN BOSTON .................................................................................................................................................... 83
  1. Determinants of innovation capacity in the MONUM ........................................................................ 84
     1.1 Resources ...................................................................................................................................... 84
     1.2 Management ................................................................................................................................. 94
1.3 Collaboration....................................................................................................................................... 106
1.4 Knowledge and learning .................................................................................................................. 115

2. Summary of the MONUM .................................................................................................................. 123

CHAPTER FIVE THE SEATTLE CITY’S INNOVATION AND PERFORMANCE TEAM (THE SEATTLE IP) ................................................................................................................. 125

1. Determinants of innovation capacity in the Seattle IP........................................................................... 126
1.1 Resources ...................................................................................................................................... 126
1.2 Management ................................................................................................................................. 135
1.3 Collaboration ............................................................................................................................... 147
1.4 Knowledge and learning ............................................................................................................. 156

2. Summary on the Seattle IP .................................................................................................................. 165

CHAPTER SIX THE MINNEAPOLIS OFFICE OF PERFORMANCE AND INNOVATION (THE OPI) .............................................................................................................................................. 167

1. Determinants of innovation capacity in the OPI ................................................................................ 168
1.1 Resources .................................................................................................................................... 168
1.2 Management ............................................................................................................................... 176
1.3 Collaboration ............................................................................................................................... 187
1.4 Knowledge and learning ............................................................................................................. 195

2. Summary on the Minneapolis OPI ....................................................................................................... 203

CHAPTER SEVEN CROSS-CASE COMPARISON AND DISCUSSION OF FINDINGS .......................................................................................................................... 205

1. Importance and interaction in the determinants of innovation capacity ........................................... 210
1.1 Human resources .......................................................................................................................... 210
1.2 Lab leadership ............................................................................................................................. 212
1.3 Intra-organizational collaboration ............................................................................................... 214
1.4 Knowledge and learning ............................................................................................................. 216

2. Important determinants in the different stages of innovation process .............................................. 217
2.1 Financial resources ...................................................................................................................... 217
2.2 Knowledge absorption ................................................................................................................ 219

3. Important determinants in the public sector ....................................................................................... 220
3.1 Organizational culture toward risks ............................................................................................ 220

4. Important determinants in each innovation lab ............................................................................... 222
4.1 Collaboration and flexibility of funding in the MONUM ............................................................... 222
4.2 Use of information technologies in the Seattle IP ....................................................................... 223
4.3 The credibility of human-centered design in the Minneapolis OPI .............................................. 224

CHAPTER EIGHT CONTRIBUTIONS AND FUTURE RESEARCH .......................................................................... 227
LIST OF FIGURES

Figure 2.1 Framework of innovation capacity in an organization ............................................................. 18
Figure 4.1 Highest degree achieved by staff .............................................................................................. 86
Figure 4.2 Major achieved by staff ............................................................................................................ 86
Figure 4.3 Professional experience prior to MONUM ............................................................................... 86
Figure 4.4 Percentage of funding from different sources .......................................................................... 90
Figure 4.5 Idea generation procedure in the MONUM ........................................................................... 102
Figure 5.1 Highest degree achieved by staff ............................................................................................ 128
Figure 5.2 Major achieved by staff .......................................................................................................... 128
Figure 5.3 Professional experience prior to IP ......................................................................................... 129
Figure 5.4 Idea generation procedure in the Seattle IP ............................................................................ 142
Figure 6.1 Highest degree achieved by staff ............................................................................................ 170
Figure 6.2 Major achieved by staff .......................................................................................................... 170
Figure 6.3 Professional experience prior to OPI ...................................................................................... 170
Figure 6.4 Idea generation procedure in the Minneapolis OPI ................................................................. 183
LIST OF TABLES

Table 2.1 Organizational resource determinants ................................................................. 19
Table 2.2 Organizational management determinants ............................................................ 25
Table 2.3 Collaboration determinants and operationalization ............................................... 32
Table 2.4 Knowledge and learning determinants ................................................................. 38
Table 2.5 Terms and definitions of innovation labs in the public sector .............................. 43
Table 3.1 Similarity and differences in three cases .............................................................. 62
Table 3.2 Example of the coding scheme of Resources ....................................................... 68
Table 3.3 Number of interviews for each innovation lab ....................................................... 73
Table 3.4 Examples of coding process in the data analysis (Human resource) ....................... 77
Table 7.1 Determinants of innovation capacity in the innovation lab .................................. 208
CHAPTER ONE

INTRODUCTION

Innovation has become a recurring theme in the public sector. It has been used to frame the transformation of public sector organizations in order to enhance the effectiveness, efficiency, and legitimacy of their public value creation processes (Bekkers et al., 2011). The growing demands for innovation in the public sector emanate from rising citizens’ expectations about the quality of life, an increasing number of “wicked problems”, and public managers’ growing ambitions concerning improved public governance mechanisms and their ability to solve social problems (Bekkers et al., 2011; Borins, 2001). In response to this demand for innovation, government organizations around the world have adopted a variety of tools to stimulate and implement new solutions to issues related to public policies and public services (Hartley et al., 2013). Those tools to support the development of public sector innovation include data analytics, co-creation, and/or crowdsourcing among others (NESTA, 2019).

Facing the increasing demand for innovation, government organizations need to further increase their innovation capacity to successfully generate and implement innovation (Boukamel et al., 2019; Meijer, 2019). Innovation capacity refers to an organizational capacity to utilize resources to continuously develop and realize new ideas into new products, services, and/or processes (Lawson & Samson, 2001; Saunila & Ukko, 2012b). In the public sector, it is often found affected by a set of factors at the individual, organizational, and network levels (Gieske et al., 2016; Mendoza-Silva, 2020). Scholars advocate that government organizations need to strengthen their innovation capacity so that they are able to act more adaptively to tackle new problems that require innovative solutions (Farazmand, 2009) and produce innovation (at least internally) more adapted, more sustainable, and more accepted (Boukamel et al., 2019). A higher
level of innovation capacity enables government organizations to obtain more resources and to better manage changes in organizations to fully implement or routinize innovative solutions and then achieve better organizational performance.

While recognizing the importance of innovation capacity in government organizations, empirical studies are still limited to explore key determinants of innovation capacity. A few number of studies have developed conceptual frameworks of innovation capacity (Boukamel et al., 2019; Gieske et al., 2016; Meijer, 2019). They reveal that innovation capacity is a multi-factorial concept that is influenced by a set of organizational attributes and components (Inków, 2020; Slater et al., 2014b). However, empirical studies that comprehensively explore those determinants are still limited. Only specific aspects of innovation capacity have been scrutinized such as collaboration (Torfing, 2019), leadership (Lewis et al., 2018), technological capacity (Lember et al., 2018), or inter-organizational learning (Hartley & Rashman, 2018). Yet, the findings of those studies still seem fragmented and other aspects of innovation capacity are not fully examined to understand their importance and the interaction among those determinants to build innovation capacity.

Recently, innovation labs are one type of government organizations to help introduce public sector innovation and build innovation capacity (Tõnurist et al., 2017). Innovation labs can be defined as any unit or team “established for the purposes of supporting public or social innovation” (Lewis et al., 2019, p. 10). Innovation labs are seen as experimental forms of government acting as innovation catalysts that take risks (Gascó-Hernandez et al., 2017). Being agile and small with a certain level of autonomy, innovation labs are a “safe space” that helps to introduce new ideas and solutions without disrupting the traditional bureaucratic structure (Carstensen & Bason, 2012; Schuurman & Tõnurist, 2017). Innovation labs apply a variety of
approaches, methods, and toolkits to address public problems and advance public sector innovation (Olejniczak et al., 2019; Piffre & Soutullo, 2017; Puttick et al., 2014; Williamson, 2015b).

An increasing number of government organizations all over the world have created innovation labs. There are over 140 innovation labs worldwide (Olejniczak et al., 2019), most of which are located in European Union member states and North America. A recent catalog of innovation labs in the U.S. shows over 120 innovation labs are created by public or private organizations, of which 24 are established by municipal governments (Wellstead & Nguyen, 2020). Exemplary cases include the Lab @ DC (2017), the Los Angeles Innovation Team (2015), the Innovation Office in San Francisco (2014), iZone (New York City Innovation Zone, Department of Education) in New York (2010), and Mayor’s Office of New Urban Mechanics in Boston (2010). The burgeoning of innovation labs around the world was facilitated by entities that advocate and propel public sector innovation and innovation labs, such as Nesta and Bloomberg Philanthropies (Fuller & Lochard, 2016). Since 2015, nearly 20 innovation labs around the world have emerged with the supporting funding of Bloomberg Philanthropies (Bloomberg Philanthropies, 2020).

Those innovation labs are based on the idea that the competencies and mindsets needed for innovation are not the same as those required for stable, daily operations and service delivery at the front line (Carstensen & Bason, 2012). Innovations are not even the same as needed for traditional, linear project design and “stage-gate” implementation (Bason, 2010). Therefore, dedicated spaces for public sector innovation are needed to bring in such different skillsets to promote innovation (Nepali et al., 2022), where the innovation process is a professional discipline and not a rare singular event. Being a dedicated unit or structure for public sector
innovation, those innovation labs are assumed to have innovation capacity by creating innovation-friendly organizational culture, available resources, and structures (Fuglsang & Hansen, 2021; Torvinen & Jansson, 2022).

At the same time, through an ongoing learning process, innovation labs are assumed to help support the uptake of new ideas and approaches in the parent organizations, where new ideas are further executed and exploited (Carstensen & Bason, 2012; Torvinen & Jansson, 2022). Scholars suggest that innovation labs engage in organizational learning with parent organizations to understand how new ideas and practices emerge and can be supported in parent organizations (Fuglsang & Hansen, 2022). Parent organizations further absorb new knowledge and ideas to transform structures and procedures (Seravalli, 2021). New knowledge and learnings are translated and materialized into new procedures and objects from innovation labs to parent organizations in tackling innovation barriers related to individual and organizational competencies (Ferrarezi et al., 2021; Torvinen & Jansson, 2022).

Those innovation labs provide an opportunity for researchers to examine innovation capacity in government organizations. As a recent phenomenon, innovation labs have only begun to receive attention from scholars in public administration to understand their role in the development of public sector innovation (Lewis et al., 2019; McGann, Blomkamp, et al., 2018; McGann et al., 2019; Williamson, 2015b). Most of these studies have focused on describing the characteristics of these labs (McGann, Blomkamp, et al., 2018; Tõnurist et al., 2017), showing a diverse landscape of innovation labs across different countries and cities in Europe, North America, South America, and Asia (Kieboom, 2014; Mulgan, 2014). While those studies seem to assume that innovation labs have innovation capacity to encourage public sector innovation, there is less discussion on what determines labs’ innovation capacity. Only a few studies have
examined specific aspects of innovation labs that influence innovation capacity (Haug & Mergel, 2021; Kimbell, 2019; Timeus & Gascó, 2018). There still lacks a structured way to thoroughly examine innovation capacity in innovation labs or lacks enough evidence on how specific determinants influence their innovation capacity.

In this regard, this study aims to further address the knowledge gap by exploring the following research question:

*What are the key determinants of innovation capacity in innovation labs?*

First, the purpose of this study aims to explore key determinants that influence innovation capacity in government organizations by examining innovation labs as one type of government organizations assumed to have innovation capacity. To answer the research question, I first built an analytical framework of innovation capacity based on an organizational capacity framework (Bryan, 2011). This framework of innovation capacity proposes the determinants in the four dimensions (i.e., resources, management, collaboration, and knowledge and learning) that influence innovation capacity in an organization. This framework is used to direct the examination of innovation capacity in the labs. It focuses on identifying what determines innovation capacity and how different determinants influence innovation capacity in the lab situation.

Second, this study focuses on city governments in the U.S. due to the following reasons. First, as most of the current knowledge is based on studies in Europe (Wellstead et al., 2021), this study intends to provide a more nuanced picture of their contribution to innovation capacity by investigating innovation labs in the U.S. While many innovation labs have been established in the U.S. (Puttick et al., 2014), there is limited academic work about their determinants of innovation capacity (Vrabie & Ianole-Călin, 2020). Second, city governments are found to have
a more pressing need to innovate (Dixon et al., 2018), since they face large scale challenges, including scarce financial resources, increasing citizens’ demands, and more wicked problems regarding policy areas such as poverty, education, and/or public health (OECD, 2019). Third, cities, where most people work and live, are displaying tremendous innovation potential in local public administrations, exploring new and different solutions to achieve goals related to residents’ well-being (Cankar & Petkovsek, 2013; OECD, 2019). They are taking a number of steps to reach their goals with local public sector innovation, among which is creating innovation labs (Bartelt et al., 2020; Nesi & Paolucci, 2018). Cities also need to build up their knowledge base to assemble the right organizational, financial, and human resource infrastructure to support their innovation efforts. This study, thus, focuses on city governments to bring a better understanding of innovation labs.

This study aims to make both theoretical and practical contributions. This study first makes theoretical contributions to the literature on innovation labs by understanding key determinants of innovation capacity within innovation labs. It opens the black box of innovation labs to understand what determinants and how they determine innovation capacity in labs (Wellstead et al., 2021). The findings of this study can be generalized to similar innovation labs in the city governments. Furthermore, by examining innovation labs as one type of government organizations, the study also contributes to public sector innovation literature by identifying key determinants of innovation capacity in a structured and comprehensive way. This may also avoid a normative discourse on innovation that is treating innovations as something the public sector “should” pursue because it produces “good” results (Timeus & Gascó, 2018). Instead, it focuses on how innovation could happen in government organizations and what skills and competencies organizations need in order to innovate continuously. Finally, the study makes contributions to
the literature about innovation capacity by understanding the importance and interaction of those determinants to build innovation capacity. The cases of innovation labs help to show how the determinants in the analytical framework influence innovation capacity in government organizations during the early stages of innovation process and identify determinants that are particularly important in the public sector.

Furthermore, this study also makes practical contributions. First, for innovation labs and their parent organizations, understanding the determinants and the dynamics between those determinants can help them to make decisions about how they can best invest in innovation capacity-building efforts in those labs (Meijer, 2019). It provides local government organizations with a clear framework for evaluating their current capacities to address complex problems that require innovative solutions, rather than counting how many innovations they are producing regardless of their needs (Timeus & Gascó, 2018). Second, given the resources flowing into public sector innovation and innovation labs, it is worthwhile to take these first steps in evaluating those innovation labs’ level of innovation capacity (Timeus & Gascó, 2018). The fact that innovation labs are emerging in one part of the world and at the same time are closing at other locations makes both practitioners and scholars wonder how they can make innovation labs more capable to further facilitate public sector innovation (Wellstead et al., 2021).

The dissertation is structured as follows. Chapter two reviews the literature on innovation capacity and innovation labs. It first clarifies the core concept of innovation capacity and identifies key determinants to create an analytical framework. It further discusses the contribution of innovation labs and identifies the knowledge gap that leads to the research question for this study. Chapter three describes the research design and methodology. Chapter four through six shows what specific determinants influence innovation capacity in three
innovation labs. Chapter seven further compares the three cases of innovation labs and discusses the findings to the research question. Chapter eight provides summary of the main results and highlights contributions of this dissertation.
CHAPTER TWO

LITERATURE REVIEW

The literature review consists of two parts. The first part of the review focuses on the literature about innovation capacity in an organization. It explains the definition of innovation capacity in an organization, how it is related to innovation performance in government organizations, and the key determinants of innovation capacity to create an analytical framework. In the second part, the review focuses on the literature about innovation labs to identify their purposes and characteristics for the development of public sector innovation. Further, I discuss the innovation capacity of innovation labs and identify the knowledge gap that leads to the research question for this study.

1. Innovation Capacity in an Organization

1.1 Definition of innovation capacity

One of the core concepts of this study is the innovation capacity in an organization. Innovation literature understands innovation capacity through different theoretical perspectives and identify what constitutes or determines innovation capacity (Djoumessi et al., 2019; Iddris, 2016b; Mendoza-Silva, 2020). Most of the literature understands innovation capacity from the perspective of organizational capacity (Arias-Perez et al., 2017; Liu & Jiang, 2016) and scholars have explored innovation capacity from three specific perspectives: as resources, as capabilities, and as outcomes (Boly et al., 2014; Doroodian et al., 2014). This sub-section reviews the definitions of innovation capacity from these three perspectives. In the end, the perspective of capabilities is selected to conceptualize innovation capacity in this study.

From the perspective of resources, innovation capacity is often understood through a resources-based view (RBV). This view suggests an organization’s competitive advantage is
connected to the kind and the number of specific resources that organizations are able to acquire, develop, and manage. Following this perspective, scholars have defined innovation capacity as resources that organizations obtain or own as inputs into innovation processes (Jørgensen & Ulhøi, 2010; O’Connor et al., 2007). For instance, Jørgensen & Ulhøi (2010) understand innovation capacity as the “resource [human and relational] inputs and intermediate transformative assets” (p. 537) that enable a firm to engage in activities needed for innovation. Scholars have distinguished between tangible and intangible resources that influence the organizational capacity to innovate (Capaldo et al., 2003; Costa & Ramos, 2015). Those tangible resources often include financial, physical, and technological resources that are available and often quantifiable inputs into an organization for innovation processes (Bao et al., 2020). Other scholars have drawn on the intellectual capital perspective to understand intangible resources that are not easily discretely measured, including human capital (knowledge, skills, satisfaction, and motivation of employees), structural capital (organizational structure, procedures, and processes, and administrative programs), and relational capital (the relations with customers and suppliers and their loyalty toward an organization) (Hasan & Abdullah, 2018; Nazarpoori, 2017).

From the perspective of capabilities, while those scholars assert the importance of the availability and attraction of resources, they argue that organizations must also have the ability to utilize those resources in ways that can contribute positively to the performance of the organization. Most of the literature defines innovation capacity following the perspective of capabilities (Fores & Camison, 2011; Olsson et al., 2010). For instance, Lawson and Samson (2001, p. 384) define innovation capacity as “the ability to continually transform knowledge and ideas into new products, processes and systems for the benefit of the firm and its stakeholders”. Similarly, Romijn and Albaladejo (2002, p. 1054) refer to innovation capability as “the skills and
knowledge needed to effectively absorb, master, and improve existing technologies, and to create new ones”. From this perspective, innovation capacity in organizations includes not only resources, but also abilities of applying the collective knowledge, skills, and resources to innovation activities relating to new products, processes, services, or management, marketing, or work organization systems, in order to create added value for the firm or its stakeholders (Frishammar et al., 2012; Hogan et al., 2011; Iddris, 2016b).

The third perspective, capacity as outcomes, is an output-based understanding of capacity and emphasizes organizational resources and capabilities that are positively related to organizational performance. Following this perspective, Liao and Li (2019) contend that innovation capability refers to a firm’s ability to efficiently and effectively launch new products in response to changes in the business environment. Similarly, Saunila and Ukko (2012a) understand innovation capacity consists of the elements influencing an organization’s capacity to manage innovation effectively that can have an effect on performance. It consists of the drivers of successful innovation, or aspects influencing an organization’s capability to manage innovation (Saunila & Ukko, 2013). It, therefore, implies the firm’s ability to conduct more effective and efficient innovation processes, thereby superior innovation performance (Wang et al., 2019). Other scholars have sought to make a less concrete linkage between capacity and organizational outcomes and argue that innovation capacity can be described as the potential to generate innovative outputs (Neely et al., 2001). This perspective on innovation capacity is focused on understanding how the structures, operating processes, and managers may impact innovation performance in organizations.

In this study, the perspective of capabilities is selected to conceptualize innovation capacity in an organization. In this regard, innovation capacity in organizations is understood as abilities
of applying the collective knowledge, skills, and resources to innovation activities relating to new products, processes, services, or management, marketing, or work organization systems (Frishammar et al., 2012; Hogan et al., 2011; Iddris, 2016b). The perspective of capabilities is selected due to the following reasons. First, the perspective of capabilities not only recognizes the importance of resources as key inputs to build innovation capacity but also emphasizes the importance of the ability to apply resources. Resources as inputs can only make contributions if they are managed or leveraged to do innovation activities (Hogan et al., 2011). Second, the capability perspective also captures both successful innovation and failed innovation attempts so that it does not limit key determinants to those leading to the success of innovation performance. A failed innovation project may not be necessarily caused by the lack of innovation capacity but is influenced by other determinants outside of organizations. Using this perspective, therefore, could give an accurate evaluation of innovation capacity, not limiting key determinants to those leading to positive innovation performance.

1.2 Innovation capacity in government organizations

In the public sector, the general term, public sector innovation, is used more often in the literature than innovation capacity to capture the generation and production of new products, services, processes, and/or systems in a public organization (Cinar et al., 2019; de Vries et al., 2018; Meijer & Thaens, 2020). Only recently, the literature shifts the discussion to innovation capacity in government organizations that aims to systematically raise innovation outputs over time and achieve better innovation outcomes (Gullmark, 2021; Trivellato et al., 2021). This subsection illustrates the relations between public sector innovation and innovation capacity and shows the importance of understanding innovation capacity in government organizations.
In the literature about public sector innovation, innovation capacity is broadly defined as a capacity to generate and implement new ideas for public problems (Gieske et al., 2016). A few works suggest that it is considered as a set of organizational capacities whose specific results are innovation (Boukamel et al., 2019; Gieske et al., 2016; Meijer, 2019). Lewis et al. (2018) argue that innovation capacity is related to innovation drivers and barriers and define it as “a set of conditions that supports innovation or provides a supportive infrastructure that either allows innovation to occur or (more positively) actively encourages it.”

As suggested by those definitions, innovation capacity matters in government organizations since it may result in increased innovation performance in terms of tangible innovation outputs and positive outcomes of innovation. Tangible innovation outputs are achieved, implemented, and embedded in the existing structure and process in organizations (Arias-Perez et al., 2017; Meijer, 2019) that can be counted quantitatively (Mergel et al., 2019), while outcomes of innovation refers to consequences generated by those new changes, such as improved process, improved services/products, or users’ satisfaction (Urgal et al., 2013; Wang & Hu, 2020). The current research suggests that the possession of innovation capacity explains why government organizations can continuously develop, manage, and implement innovation (Clausen et al., 2019; Trivellato et al., 2021). Scholars argue that innovation-friendly organizational culture, available resources, and structures and systems can stimulate government organizations to continuously innovate and to achieve expectations regarding their responsiveness, the quality, and effectiveness of the public services, and growing disenchantment with representative democracy (Trivellato et al., 2019). Innovation capacity enables government organizations to adapt themselves to the external environment, learn new knowledge, and reconfigure internal
resources/knowledge rapidly while going through changes so that they manage to achieve sustainable public sector innovation (Gullmark, 2021; Trivellato et al., 2021).

Scholars also highlight the need of innovation capacity to innovate necessarily in a balanced, legitimate, and fair manner, instead of proposing more and faster public sector innovation (Meijer & Thaens, 2020). While most scholars further suggest that public sector innovation achieves positive effects, some scholars find a “perverse effect”, which refers to unforeseen negative consequences that are sometimes even exactly the opposite to the intended effect (Larsson & Brandsen, 2016; Meijer & Thaens, 2020). A range of risks includes lack of stability, limited public control to hold accountability, waste of money, denial of democratic processes, and unforeseen security risks that may lead to perverse effects. They may result from fundamental features of public innovation processes and the way the innovation is managed, implemented, or influenced by administrative and political dynamics. A high level of innovation capacity allows government organizations to manage properly risks and uncertainties in the innovation process so that they achieve public sector innovation fit for public needs (Serrano Cárdenas et al., 2019; Trivellato et al., 2021).

Having recognized the importance of innovation capacity in government organizations, recent academic works start to explore key determinants of innovation capacity. A few scholars have developed comprehensive frameworks of innovation capacity in public organizations (Boukamel et al., 2019; Gieske et al., 2016; Meijer, 2019). Those scholars have drawn upon theories about innovation management and innovation system in the private sector to build a conceptual framework of innovation capacity for government organizations. They reveal that innovation capacity is a multi-factorial concept that is influenced by a set of organizational attributes and components (Inków, 2020; Slater et al., 2014b). The following section 1.3 further
illustrates those determinants that are considered key to influence innovation capacity in an organization.

Yet, those frameworks were barely empirically examined in the public sector to explore how specifically those determinants influence innovation capacity in government organizations. Some scholars have scrutinized specific aspects of innovation capacity such as collaboration (Torfing, 2019), leadership (Lewis et al., 2018), technological capacity (Lember et al., 2018), or inter-organizational learning (Hartley & Rashman, 2018). However, the findings of those studies are still limited and fragmented. Some scholars suspect that how those determinants influence innovation capacity may be different across the stages of innovation process (Boukamel et al., 2019) and between public and private sectors (Meijer, 2019). They suggest that learning capacity and knowledge management may matter throughout the innovation process, and particularly at the beginning (idea emergence requires knowledge), while technological resources may matter more in the latter stage when communicating and formalizing new changes (Boukamel et al., 2019). Others suggest that institutionalizing innovation in government organizations requires more leadership commitment and top support to secure resources and legitimacy for new practices and policies (Lewis et al., 2018). Others show that innovation in the private sector is often driven by competition and users’ needs, while innovation in the public sector is driven by public value where both users’ and non-users’ interests shall be considered (Meijer & Thaens, 2020). Innovation capacity in public organizations may need more changes in organizational structure, culture, communication, employees’ incentive, and time for innovation to encourage public sector innovation (Cankar & Petkovsek, 2013; Demircioglu & Audretsch, 2017). Some determinants, such as customer relationship management (e.g., Lin et al., 2010) or quality management (Sahoo, 2019), while making important influence on innovation capacity in the
private sector, may not have the same influence or importance on innovation capacity in government organizations. The knowledge is still limited about how those determinants influence innovation capacity in the public sector and their importance and interaction to enhance innovation capacity.

1.3 Determinants of innovation capacity

To further understand determinants of innovation capacity in government organizations, I resort to the innovation literature about private sector innovation, since the study of innovation capacity in the private sector has a longer history (Mendoza-Silva, 2020). I use an analytical framework of organizational capacity proposed by Bryan (2011) to further categorize the determinants of innovation capacity. According to this framework, four dimensions of organizational capacity (i.e., Resources, Management, Knowledge, and Collaboration) are important to identify key determinants of innovation capacity. Bryan’s framework of organizational capacity represents broad constructs that disentangle the complex set of determinants directly influencing organizational capacity. As innovation capacity can be regarded as an organizational capacity in the particular case of innovation, this framework helps to point out key determinants of innovation capacity. Furthermore, Bryan’s framework combines the perspectives of resource dependence theory and the perspectives of strategic management theories to understand organizational capacity. This aligns with the definition of innovation capacity in this study by highlighting the importance of both resource availability and organizational process to acquire and utilize those resources for organizational advantage. It provides not only a static view but also a dynamic perspective to understand key determinants of innovation capacity.
I further reviewed private sector innovation literature and public sector innovation literature to identify key determinants within four dimensions. First, multiple online databases have been included to locate relevant literature and studies, including Academic Search Complete, Business Source Complete, Web of Science, and ScienceDirect. The following key terms were searched in the field of abstract that combined innovation capability/capacity and determinants/drivers/factors/enablers/barriers. Both empirical and theoretical studies published in English from peer-reviewed journal articles, conference papers, books, and other documents were included. I filtered the results by reading titles and abstracts. Further, the whole paper was scanned for those papers that were difficult to decipher. Eventually, 259 articles were included in the next step of review and analysis. Among them, only 15 studies are specifically about innovation capacity in public organizations. The analysis of those studies focused on the key determinants identified to influence innovation capacity in an organization.

Figure 2.1 illustrates the analytical framework of innovation capacity developed in this study. The specific components in each dimension are components that are commonly mentioned by private sector innovation literature. The rest of the section further discusses the specific determinants of innovation capacity under the four dimensions to build the analytical framework.
1.3.1 Resources

Scholars have identified three types of resources that are critical to influence innovation capacity in organizations: human resources, financial resources, and information technological resources. Table 2.1 shows the organizational resource determinants mentioned in the literature.

**Figure 2.1 Framework of innovation capacity in an organization**
### Table 2.1 Organizational resource determinants

<table>
<thead>
<tr>
<th>Sub-category</th>
<th>Determinant</th>
<th>Description</th>
<th>Reference</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Human resources</strong></td>
<td>Level of employees’ knowledge and skills</td>
<td>Staff’s personal educational background and professional experience, competencies and skills related to creativity, learning, communication, and networking</td>
<td>(Costa &amp; Ramos, 2015; Donate et al., 2016; Nazarpoori, 2017)</td>
</tr>
<tr>
<td></td>
<td>Diversity of employees’ knowledge and skills</td>
<td>Diversity in staff’s personal educational background and professional experience</td>
<td>(Costa &amp; Ramos, 2015)</td>
</tr>
<tr>
<td></td>
<td>Employees’ attitude and motivation</td>
<td>Staff’s attitudes relate to the orientation towards cooperation, knowledge sharing, risk assumption, creativity</td>
<td>(Costa &amp; Ramos, 2015; Tierney et al., 1999)</td>
</tr>
<tr>
<td><strong>Human resource management</strong></td>
<td>Hiring</td>
<td>Recruiting the right employees with the right competences for innovation</td>
<td>(Chen &amp; Huang, 2009; Donate et al., 2016)</td>
</tr>
<tr>
<td></td>
<td>Training</td>
<td>Training programs to increase creativity for innovation</td>
<td>(Chen &amp; Huang, 2009; Donate et al., 2016)</td>
</tr>
<tr>
<td></td>
<td>Performance and reward</td>
<td>Monetary and nonmonetary incentives to encourage employees’ innovation activities</td>
<td>(Al Othman &amp; Sohaib, 2016; Donate et al., 2016)</td>
</tr>
<tr>
<td></td>
<td>Employee empowerment</td>
<td>Empower employees with a certain degree of autonomy and self-efficacy</td>
<td>(Cakar &amp; Erturk, 2010; Chen &amp; Huang, 2009)</td>
</tr>
<tr>
<td><strong>Financial resources</strong></td>
<td>Availability of financial resources</td>
<td>Retention of excess capital for innovation</td>
<td>(Bao et al., 2020)</td>
</tr>
<tr>
<td></td>
<td>Discretion of financial resources</td>
<td>Authority to use funding for innovation</td>
<td>(Sharfman et al., 1988)</td>
</tr>
<tr>
<td><strong>Information technology</strong></td>
<td>IT for knowledge management</td>
<td>Technology platforms for knowledge exploration, sharing, and exploitation</td>
<td>(Al Othman &amp; Sohaib, 2016; Aramburu &amp; Saenz, 2011)</td>
</tr>
<tr>
<td></td>
<td>IT for collaboration and interaction</td>
<td>Technology platforms for networking and collaboration</td>
<td>(Aramburu &amp; Saenz, 2011; F. Wang et al., 2017)</td>
</tr>
</tbody>
</table>

### Human resources

Human resources are generally defined as the knowledge, expertise, competencies, skills, attitudes, values, and motivation of the employees within organizations (O’Connor et al., 2007). In the literature, staff’s knowledge and skills as well as their attitudes and motivation toward innovation determine innovation capacity in organizations. In this regard, an organization’s human resource management, consisting of those activities designed to provide for and
coordinate the people of an organization, is also critical to develop necessary human resources for innovation activities (Chow & Gong, 2010; De Saá-Pérez & Díaz-Díaz, 2010).

First, most of innovation literature agrees employees with a high level of professional knowledge and a high level of skills related to creativity, learning, and communication are likely to learn faster, apply new and existing knowledge more creatively, and hence resulting in more new knowledge to enhance the ability of generating new ideas (Hasan & Abdullah, 2018; Hitt et al., 2002; Verma & Rao, 2016). In the public sector literature, scholars suggest that public employees are needed who are more reflective and creative as well as have empathy towards users’ and colleagues’ needs and issues to increase innovation capacity in public organizations (Boukamel et al., 2019). Considering the argument in most literature, a high level of employees’ skills and knowledge related to innovation is critical to enhance innovation capacity.

Second, innovation literature suggests that employees with heterogeneous education backgrounds and diverse knowledge are more capable to produce new ideas and to develop product innovation (Aramburu & Saenz, 2011; Zohra, 2017). Innovation is a complex task which often requires more information than is possessed by a given individual. The combination of different backgrounds, competencies, and perspectives of employees sources the collective knowledge of the organization. And by means of collective knowledge, the organization reaches a higher level of innovation capacity as a result of exchanging and sharing information and perspectives become possible (Koc, 2007). In this regard, the diversity of the employees’ knowledge and skills enhances innovation capacity in an organization.

Third, literature shows that employees with high motivation for innovation often have an orientation toward taking risks and are not afraid to experiment with new things and apply resources for new ideas (Mazzucchelli et al., 2019; Moussa & Arbi, 2020). They are more
willing to search for new knowledge and tend to become more inventive, resourceful, and perseverant in the face of obstacles, thereby enhancing innovation capacity for innovation processes which is often associated with uncertainty and risks (Lei et al., 2020; Verma & Rao, 2016; Wasko & Faraj, 2005). However, in the public sector innovation, scholars often suggest that public employees’ neutral or even negative attitudes toward innovation may hinder the innovation to take place and thus reduce innovation capacity in public organizations (Gieske et al., 2019; Lewis et al., 2018; O’Connor et al., 2007). The risk-averse mindsets often discourage public employees to invest their time and energy in new idea exploration and experimentation so that limited resources hinder innovation capacity in public organizations (OECD, 2019).

Given the importance of human resources, many scholars further point out that human resource management toward innovation is also critical to developing necessary human resources to enhance innovation capacity (OECD, 2019; Sikombe et al., 2019; Zohra, 2017). Scholars suggest that when organizations use creative skills and/or innovative characteristics as hiring and selection criteria, their employees are likely to spawn a diversity of ideas and commit to more innovative behaviors (Chen & Huang, 2009). Recruiting and selecting the right employees with the right competencies for innovation enable organizations to integrate diverse sources of knowledge and hence stimulate innovations (Chow & Gong, 2010; Hosseinpour & Kordlouie, 2018).

Second, Chen and Huang (2009) show that training enables employees to be exposed to a variety of knowledge that innovation activities require and helps them to become more open to new trends and ideas from outside of an organization. Through training, staff’s knowledge, skills, and abilities are found to be evaluated to more quickly produce new ideas or to introduce organizational changes (Koc, 2007). Training is also found to help retain employees as they feel
indebted to the organization so as to ensure a sustained supply of abilities and talents demanded by innovation capacity (Zohra, 2017).

Third, scholars show that employees are motivated by both extrinsic and intrinsic rewards to take the challenging work and to generate more new ideas and products (Al Othman & Sohaib, 2016; Donate et al., 2016). Rewarding employees on learning and knowledge acquiring, staff are encouraged to generate new knowledge, share their knowledge, and accumulate multiple skills for creativity and thus more abilities for innovation (Kim & Chang, 2009; Saunila, 2017).

Finally, employees’ involvement and empowerment in the innovation process is found to create the conditions to encourage employees to bring new ideas and exchange knowledge in the ongoing innovation process and, in turn, enhance innovation capacity in organizations (Jiménez-Jiménez & Sanz-Valle, 2011; Tsai, 2018). Scholars suggest empowerment makes people feel they possess a certain degree of autonomy and power in decision-making, feel less constrained by rule-bound aspects, and are self-effective in enacting their work; combined, these features enable people to be more innovative (Cakar & Erturk, 2010).

**Financial resources**

Financial resources refer to the availability of funding leveraged into different environments, technologies, and products (Smith et al., 2008). Both availability and discretion of financial resources for innovation are found critical to influencing innovation capacity.

First, most innovation literature seems to agree that slack resources offer flexibility for organizations to rapidly and decisively respond to environmental change, which determines their innovation capacity (Bao et al., 2020; Damanpour, 1991; Raghuvanshi et al., 2019). As innovation activities require a lot of resources, lacking financial resources increases the possibility of failure, leading to a lower capacity to manage innovation activities (Kim et al.,
Yet, some research suggests that while small organizations do not have sufficient funds, they are still able to utilize the limited resources in creative ways with “lean innovation capability” (Bicen & Johnson, 2014, 2015). In the public sector, the lack of sufficient monetary assets for piloting and scaling up innovation projects is regarded as a critical challenge to make an investment in innovation (O’Connor et al., 2007; OECD, 2019). Considering the argument in most literature, the high availability of financial resources enhances innovation capacity in an organization.

Second, a high level of discretion of financial resources is found to determine innovation capacity by granting managers more utilization choices. It refers to a high flexibility in using financial resources in adjusting to alternative purposes (Sharfman et al., 1988). In line with the resource-based theory, high-discretion slack also enables organizations to conduct exploratory research and external communication activities that are outside organizational routines, which would promote learning, sharing, and creation of knowledge to increase innovation capacity in organizations (Chandy & Tellis, 2000; Huang & Li, 2012). In the public sector, Vigoda-Gadot (2003) recognizes that a short-term budget and planning is one of the main barriers to increase innovation capacity in public organizations. It often limits the flexibility of using financial resources and public organizations rarely have the autonomy to explore new possibilities in providing public services using funds with specific purposes, which limits innovation capacity in public organizations. Considering the argument in most literature, the high discretion of financial resources enhances innovation capacity in an organization.

**Information technology**

Generally speaking, organizations using information technologies more intensively are likely to have more innovation capacity than those using them less (Barkat et al., 2018; Siddiqui et al.,
In the public sector, the use of information technology has been considered as a key determinant to explore, develop and/or adapt new solutions in public service design, delivery, and evaluation (Lember et al., 2018).

First, the literature shows that the use of information technology for knowledge management helps organizations to more quickly explore, access, share, and retrieve new knowledge about users, competitors, or general trends in society (Al Othman & Sohaib, 2016; Vicente et al., 2015). Scholars found that with the help of IT, staff have gained easier access to a wide range of knowledge resources and are able to draw together fragmented knowledge more effectively that cross-fertilize new ideas or solutions (Siddiqui et al., 2019). In the public sector, data management technologies are found to build innovation capacity by revealing new trends in organizational performance and identifying causes of public or social problems (OECD, 2019). Government organizations are able to re-think holistically to tackle their challenges and foster new products, processes, and organizational methods that bring down the marginal costs and inefficiencies of public services (Boukamel et al., 2019; Gieske et al., 2016).

Second, scholars also found that using information technology for interaction and collaboration enhance innovation capacity by building frequent communication and connection among innovation partners through formal platforms (e.g. online conferencing tools and groupware systems) and informal mechanisms (e.g. blogs and e-community) (Aramburu & Saenz, 2011; Hosseini et al., 2017). With those digital platforms, focal organizations are able to build a wider connection and collaboration with multiple partners at low cost and high efficiency so that more knowledge and expertise are leveraged from those partners for quicker generation of new ideas, regardless of time and space (Wang et al., 2017).

1.3.2 Management
In the literature, four sub-categories of determinants in the management are identified as critical to influence innovation capacity in organizations: leadership, vision and strategy, ideation and organizational structure, and organizational culture. Table 2.2 shows determinants in four sub-categories of management.

**Table 2.2 Organizational management determinants**

<table>
<thead>
<tr>
<th>Sub-category</th>
<th>Determinant</th>
<th>Description</th>
<th>Reference</th>
</tr>
</thead>
<tbody>
<tr>
<td>Leadership</td>
<td>Leaders’ attitudes and commitment</td>
<td>Leaders’ attitude and mindset toward innovation development</td>
<td>(Al Othman &amp; Sohaib, 2016)</td>
</tr>
<tr>
<td></td>
<td>Leaders’ activities and skills</td>
<td>Leaders’ actions in developing strategies, human resources, networking, legitimization, culture development</td>
<td>(Tikas &amp; K.B., 2017)</td>
</tr>
<tr>
<td>Vision and strategy</td>
<td>Innovation strategy</td>
<td>Strategic goals and vision that promote innovation and a balanced innovation project portfolio</td>
<td>(Aramburu &amp; Saenz, 2011; C. L. Wang &amp; Ahmed, 2004)</td>
</tr>
<tr>
<td></td>
<td>Strategic alignment</td>
<td>Aligning innovation strategies with organizational overall goals and with environmental changes</td>
<td>(Vicente et al., 2015)</td>
</tr>
<tr>
<td>Organizational structure and procedure</td>
<td>Idea generation process</td>
<td>An organization’s process of interaction with customers, suppliers, employees, and other partners to generate innovative products or service ideas</td>
<td>(Doroodian et al., 2014; Saunila &amp; Ukko, 2013)</td>
</tr>
<tr>
<td></td>
<td>Decentralization</td>
<td>The extent to which the right and authority to make decisions and evaluate activities within an organization is distributed among different organizational sections.</td>
<td>(Dekoulou &amp; Trivellas, 2017; Kim et al., 2018)</td>
</tr>
<tr>
<td>Organizational culture</td>
<td>Innovative culture</td>
<td>The values and beliefs shared by members of an organization that guide the expected behavior toward innovation</td>
<td>(Aramburu &amp; Saenz, 2011; Jin &amp; Lee, 2020)</td>
</tr>
<tr>
<td></td>
<td>Tolerance of mistakes, failure, or risk</td>
<td>Tolerant toward entrepreneurial risk-taking and ambiguity and entailing experimentation, freedom, playfulness, risk-taking, and empowerment</td>
<td>(Andersson et al., 2020; Dost et al., 2018; Jin &amp; Lee, 2020)</td>
</tr>
<tr>
<td></td>
<td>Proactiveness</td>
<td>Put high level of efforts to understand and monitor environment in order to predict new opportunities and trends for innovation</td>
<td>(Dost et al., 2018; Jin &amp; Lee, 2020)</td>
</tr>
<tr>
<td></td>
<td>Citizen-orientation</td>
<td>Place the highest value on creating superior customer value and meeting citizens’ needs</td>
<td>(Grawe et al., 2009)</td>
</tr>
</tbody>
</table>

**Leadership**

Leadership has been widely recognized as one of the most important determinants to influence innovation capacity (Boukamel et al., 2019; Mendoza-Silva, 2020). Organizational leaders or top managers are the people who decide how an organization’s resources are spent and
in what strategic direction the organization is heading. The overall leadership attitudes, skills, and activities are found important to build innovation capacity (Frishammar et al., 2012).

First, it is important to have the support and recognition from top management to build innovation capacity in organizations. The innovation literature suggests that leaders with a clear strategic intent toward innovations create a sense of urgency among employees and focus them on achieving innovative solutions (Frishammar et al., 2012). It also enables organizations to have a continuous allocation of financial and human resources to the exploration of new ideas and thus build innovation capacity (Slater et al., 2014a). In the public sector innovation literature, leaders’ commitment and supportive attitude toward innovation is able to provide recognition and rewards that motivate public employees to participate in innovation activities and allocate essential resources to build innovation capacity for the development of public sector innovation (Emery et al., 2016; Lewis et al., 2018; Ricard et al., 2017). Yet, most leaders in the public sector are rarely tuned to innovation but to keep stability and remain unchanged (Carstensen & Bason, 2012).

Second, scholars suggest that leaders’ behaviors and skills have a considerable effect at the strategic level, resource level, and network level to build innovation capacity (Le & Lei, 2019; Tikas & K.B., 2017). First, at the strategic level, leaders are found to articulate strategic intent as a rallying point for their organization and communicate important organizational values to their employees. They enable employees to focus on utilizing resources for innovative solutions and motivate them to share knowledge so that new knowledge could be developed to enhance innovation capacity in organizations (Al Othman & Sohaib, 2016). Second, at the resource level, leaders play an important role in further developing human resources through recruitment and training that are capable of innovation activities (Slater et al., 2014a). They directly enhance
innovation capacity by allocating resources to include the right people, funds, and time duration that facilitates the action of introducing new initiatives, activities, procedures, or structures (Tikas & K.B., 2017). Leaders also help to develop communication systems amongst employees to transfer knowledge and skills that facilitate organizational learning to build innovation capacity (Gil et al., 2018). Third, at the network level, leaders facilitate connections with external organizations in order to access resources that are lacking internally to enhance innovation capacity (Kim et al., 2018). In the public sector innovation literature, a recent study by Ricard et al. (2017) shows that the articulation of strategic intention and networking are regarded as commonly shared activities to stimulate innovation activities.

**Vision and strategy**

Organizational innovation strategy, in general, refers to the strategic goals and vision that promote innovation (Mendoza-Silva, 2020) and the principles that indicate to an organization’s members in which area knowledge creation or innovation should be pursued. Organizations with a clear strategic vision for innovation and a good strategic alignment with an organization’s goals are found to enhance innovation capability (Frishammar et al., 2012).

First, the existence of an innovation strategy determines the configuration of resources, products, processes, and systems that organizations adopt to develop and implement innovation (Iddris, 2016a; Lawson & Samson, 2001). It increases the alignment of the existing resources, systems, and processes that organizations need to build innovation capacity to meet market uncertainty (Samson & Gloet, 2014; Wang & Ahmed, 2004). Scholars argue that while organizations may be able to innovate in a non-routine or ad hoc manner, it is unlikely that they will have innovation capacity persistently without a strategy or a common vision to generate new
products or services (Clausen et al., 2019; Essmann, 2009). In this sense, innovation strategies are critical to enhance innovation capacity.

Second, the innovation literature suggests that alignment of innovation strategy with organizational overall goals is also important to ensure the allocation of sufficient resources for different stages of the innovation process and for innovation outputs (Frishammar et al., 2012). An appropriate innovation strategy that goes along with corresponding internal structures and processes is found to help design suitable initiatives that effectively mobilize those resources that organizations need most for the development of their innovation capacity (Hosseini et al., 2017). Besides, scholars also suggest that adapting innovation strategy along with changing environments enables organizations to achieve superior innovation capacity over time (Vicente et al., 2015). It reconfigures the structure, process, methods, and technology strategies so that organizations are able to find the most appropriate ways to effectively mobilize resources for innovation in response to environmental changes.

**Organizational structure and procedure**

Organizational structure and process are understood as the set of ways in which organizational work is divided into separate tasks, delegated, and coordinated toward the achievement of corporate goals (Mintzberg et al., 1976). In the literature, scholars commonly mention that an idea generation process and a decentralized structure are two important determinants to enhance innovation capacity.

First, an idea generation process refers to an organizational interaction with customers, employees, and other partners to generate and implement innovative products or service ideas (Iddris, 2016a). The innovation literature suggests that it enables organizations to collect and analyze different types of data, including existing customers’ preferences and characteristics, and
to synchronize different units’ activities in new product development (Tikas & K.B., 2017). Organizations are able to mobilize resources from multiple sources, optimize innovation processes along with their supply chain, and effectively utilize resources to generate a large number of ideas (Bessant et al., 2012; Tan et al., 2015). Lawson and Samson (2001) further argue that an idea generation process enables employees to have sanctioned time to think, or “creative slack” that enables them to be free from short-term operational challenges and have time for “blue-sky” thinking (Vicente et al., 2015).

Second, most scholars agree that a decentralized organizational structure facilitates idea generation and enhances innovation capacity (Gil et al., 2018; Koc, 2007). Feeling less constrained by the rule-bound aspects, employees are willing and able to seek innovative solutions to their tasks or problems (Liu et al., 2018). Other studies show that a decentralized structure facilitates both internal and external communication and increases not only the quantity but also the quality of ideas, information, and knowledge generated and diffused within the organization (Dekoulou & Trivellas, 2017). Those interactions increase the availability of resources for innovation development and thus increase innovation capacity in organizations. In the public sector innovation literature, a high level of centralization and strict hierarchies reinforce silo mentality and traditional roles, which are assumed to be characteristics that inhibit employees’ ability to generate innovative ideas (Sørensen & Torfing, 2012). Therefore, public organizations will have greater innovation capacity when their internal divisions and hierarchies enable communication across levels.

**Organizational culture**

Organizational culture refers to the values and beliefs shared by members of an organization that guide the expected behavior (Yesil, 2014). Most scholars agree that organizations with an
innovation-supportive culture are able to learn from previous experiences and motivate employees to build innovation capacity for generating new ideas and innovative solutions to problems (Bastic & Leskovar-Spacapan, 2006; Bennett & Parks, 2015). Such culture is found to be associated with tolerance toward risks and ambiguity, proactiveness, and orientation to customers.

First, since the innovation process is often associated with ambiguity, uncertainty, and risks, a risk-aversion culture steers organizations away from potential failure or mistakes of experiments on new ideas and refrains them from innovation activities (Aljanabi, 2018). Contrarily, tolerance toward failure or mistakes increases employees’ psychological safety and reduces their perceived interpersonal threats (Dost et al., 2018). Under such a culture, they are found to apply substantial resources into an unknown territory of innovation and thus build their innovation capacity. It further encourages them to learn from their mistakes, voice new insights, and exchange rich information among organizational members for new ideas, which is regarded as beneficial to building innovation capacity in organizations (Andersson et al., 2020). In the public sector, recent practitioners’ reports show that government organizations with a more risk-tolerant culture invest more resources and recruit additional public employees to further build their innovation capacity (Emery et al., 2016; OECD, 2019).

Second, an organizational culture that promotes proactiveness and change is found to enhance innovation capacity. As innovation demands more or less radical changes in existing practices and routines, a proactive culture enables organizations to understand potential changes ahead of time and then make preparation for them early in the innovation process (Aljanabi, 2018). The innovation literature suggests that proactiveness culture encourages employees to search for new knowledge in the context and experiment with new opportunities during the
dynamic environmental trends (Dost et al., 2018). This further drives an organization to invest more of their resources to come up with unique products or services far ahead of their competitors to gain an advantage (Aljanabi, 2018).

Third, the innovation literature agrees that customer orientation enables organizations to build innovation capacity by being well-positioned to anticipate changes in needs and develop new products and services. By thinking on behalf of the customer, scholars show that organizations are driven to explore their resources to introduce cutting-edge services that effectively and timely respond to the needs (Bastic & Leskovar-Spacapan, 2006; Slater et al., 2014a). Other scholars further argue that anticipating customers’ latent and future needs is also critical to proactively develop new products or services to fulfill customers’ demands (Mohr et al., 2012; Slater et al., 2014a). Applying this notion to public sector innovation, citizen-orientation enables public organizations to mobilize more resources for the development of new solutions to better deliver public services. It drives public organizations to place a higher priority on citizens’ needs, to collect information about different citizens’ demands, and to effectively and timely respond to them through the adaption of public services (Alves, 2013; Ansell & Torfing, 2021).

1.3.3 Collaboration

Collaboration refers to establishing and maintaining connections between external and internal actors and knowledge so that public sector organizations could combine new ideas, resources, knowledge, and actors for innovations (Boukamel et al., 2019; Lewis et al., 2018). Generally speaking, collaboration with multiple actors helps organizations acquire additional resources to combine with their own knowledge to enhance their innovation capacity (Ze et al., 2018; Zhang & Hartley, 2018). In the literature, scholars find that internal collaboration among
subunits, collaboration with external partners, and network governance are three sub-categories of determinants that influence innovation capacity in organizations. Table 2.3 shows determinants in three sub-categories of collaboration.

**Table 2.3 Collaboration determinants and operationalization**

<table>
<thead>
<tr>
<th>Sub-category</th>
<th>Determinant</th>
<th>Description</th>
<th>Reference</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intra-organizational collaboration</td>
<td>Cross-functional communication</td>
<td>The exchange of resources and mutual understanding between parties within an organization to achieve goals of all participants and involves the various roles played by the members of the collaboration</td>
<td>(Ganguly et al., 2019)</td>
</tr>
<tr>
<td>Collaboration with external partners</td>
<td>Inter-organizational collaboration</td>
<td>The exchange of resources and mutual understanding with external organizational partners</td>
<td>Ahavvan &amp; Hosseini, 2016; Wang &amp; Hu, 2020b; Weber &amp; Heidenreich, 2018</td>
</tr>
<tr>
<td>Collaboration with citizens/users</td>
<td>The exchange of resources and mutual understanding with end-users or citizens</td>
<td></td>
<td>Pedron et al., 2018</td>
</tr>
<tr>
<td>Shared motivation, understanding, and commitment</td>
<td>Partners share a similar level of commitment toward innovation projects, a shared vision about joint action to achieve innovation outputs.</td>
<td></td>
<td>Ahavvan &amp; Hosseini, 2016; Ganguly et al., 2019; Weber &amp; Heidenreich, 2018</td>
</tr>
<tr>
<td>Trust</td>
<td>Partners have confidence that the other party in the exchange relationship will not exploit its vulnerabilities</td>
<td></td>
<td>Ahavvan &amp; Hosseini, 2016; Weber &amp; Heidenreich, 2018</td>
</tr>
<tr>
<td>Network governance</td>
<td>Boundary-spanning</td>
<td>Identifying, communicating, and engaging in networking opportunities within a diverse range of external actors.</td>
<td>Kulongara et al., 2016; Meijer, 2019; Ze et al., 2018</td>
</tr>
<tr>
<td>Relationship management</td>
<td>Investing in the build-up of stakeholder relationships and engaging in trust-building and goal identification exercises</td>
<td></td>
<td>Saenz &amp; Perez-Bouvier, 2014; Weber &amp; Heidenreich, 2018</td>
</tr>
</tbody>
</table>

**Intra-organizational collaboration**

Some scholars point out that innovation comprises activities involving the joint use of skills, information, and knowledge as well as a collective bearing of risks (Frishammar et al., 2012; Liao & Li, 2019; Yang et al., 2018). Those studies show that intra-organizational collaboration is a way to ensure that the expertise of each relevant department, unit, or function is incorporated into the process innovation activities (Liao & Li, 2019; Yang et al., 2018). It enables knowledge
sharing among individuals so that employees can have access to and be equipped with new and valuable knowledge/skills which increase their own innovation capacity to generate new ideas into innovation (Lin, 2007).

Particularly, the innovation literature shows that cross-functional communication is a useful way to establish intra-organizational collaboration for the purpose of innovation. It helps to maximize knowledge sharing and exchange of key resources needed for the development of innovation as well as to find the right mix of skills and competencies when developing innovation (Yang et al., 2018). Jansen et al. (2006) suggest that dense intra-organizational networks support the diffusion of shared norms and behavioral expectations, but those shared norms may constrain members from thinking out-of-box and limit creativity, which may constrain radical innovation. In the public sector innovation literature, scholars suggest that internal networks by socialization and coordination tactics help to build innovation capacity in organizations by facilitating knowledge sharing for new ideas (Gieske et al., 2016; O’Connor et al., 2007).

**Collaboration with external partners**

As innovation often involves the use of skills, information, and knowledge that are not included within the organizational boundaries, scholars argue that organizations need to strengthen their internal innovation capacity through collaboration with other organizations or individuals (Kim et al., 2018; Meijer, 2019). The literature suggests that collaboration with both external organizations and individual citizens results in better availability and utilization of resources that further enhance innovation capacity. Within the collaboration, a shared understanding and trust relationship helps to ensure continuous contribution from partners to build innovation capacity in the focal organizations.
Most innovation literature suggests that connecting with multiple organizations from different fields of expertise enables focal organizations to gain diversified information and/or skills that help to increase the resources for innovation and thus to increase their innovation capacity (Akhavan & Hosseini, 2016; Ze et al., 2018). Such collaboration helps focal organizations reach previously unknown ideas and to break through existing assumptions that prevent them from thinking creatively (Wang & Hu, 2020b; Weber & Heidenreich, 2018). Focal organizations are able to acquire resources or skills that are complementary to internal resources more quickly to cross-fertilize new ideas and develop new products (de Souza Bermejo et al., 2016; Tikas & K.B., 2017). In the public sector, scholars have started to recognize the importance of inter-organizational collaboration to increase innovation capacity (Hartley et al., 2013; Sørensen & Torfing, 2011; Torfing & Triantafillou, 2016). Among different organizations, large and small companies, social entrepreneurs, societal organizations, and knowledge institutes are often mentioned as important partners that could help public sector organizations to enhance innovation capacity (Sørensen & Torfing, 2011). They may play important roles in transferring new knowledge, and delivering ideas and means for innovation generation (Kuehne et al., 2015; Slater et al., 2014a).

Furthermore, citizens are a special group to be mobilized for innovation who can help to assess what is valuable and engage in the innovation processes as end-users. Some works on innovation management have reported the significance of customer engagement in building innovation capacity (Baldwin & von Hippel, 2011; von Hippel, 2005). Specifically, involving end-users in the early stage of the innovation process helps to develop more differentiated products and services for particularly targeted customers. It improves the capacity to design new products and allows the organization to better understand its needs and leads to higher service
advantage and service newness (Berenguer De Vasconcelos & Gois De Oliveira, 2018; Zhang & Zhu, 2019). Collaborating with users in the later stage further introduces ongoing feedback for the improvements to the potential of established designs, processes, and markets (Lin et al., 2010). In the public sector, literature has found that openness toward individual citizens’ inputs is useful to find ideas, develop new projects, and empower these citizens to formulate their own initiatives and present more innovative insights to governments (Emery et al., 2016; OECD, 2019).

What’s more, in the collaboration with external partners, scholars argue that it is important to build a shared motivation, commitment, and understanding of the collaborative relations to effectively enhance innovation capacity (Konsti-Laakso et al., 2012). Innovation literature shows that a shared common goal helps those partners in visualizing the benefits of these exchanges and hence leads to increased intention to share resources that are necessary to build innovation capacity (Akhavan & Hosseini, 2016; Weber & Heidenreich, 2018). It develops a shared language, vocabulary, and/or narrative that reduces misinterpretation or conflicts so that knowledge from multiple sources is recombined without losing the rich sets of meaning to give rise to more creative thinking and new ideas (Bashir et al., 2018; Camps & Marques, 2014). Yet in the public sector, scholars often find that innovations involving multiple actors are not straightforward and barriers such as lack of shared understanding, lack of trust, and inappropriate accountability are often identified (Cinar et al., 2019; Pietroburgo, 2012).

Finally, scholars also frequently suggest that trust among actors is critical in collaboration to build innovation capacity. The innovation literature shows that trust dissolves the boundaries between organizations, mitigates conflicts, and helps foster common interest, enabling organizations to increase the depth, breadth, and efficiency of their mutual exchange of
knowledge, and thus build their innovation capacity (Bashir et al., 2018; Delbufalo, 2017). Akhavan and Hosseini (2016) show that trust also decreases perceived uncertainty among partners so that they are more willing to explore each other’s useful knowledge for the development of innovation. In the public sector, scholars also argue that mutual trust between governments and partners helps to build a strong relationship in collaboration and thus to enhance knowledge sharing and innovation capacity for new information technology projects (Carbonara & Pellegrino, 2018; Luna-Reyes, 2013; Surva et al., 2016).

Network governance

The literature, in general, agrees that network governance decreases potential conflicts and generates agreed-upon innovations, where multiple actors interact and collaborate to generate new solutions that suit their interests (Blind, 2005; Boukamel et al., 2019; Mendoza-Silva, 2020). Network governance refers to practices or routines in an organization to create and sustain relations with both internal and external actors (Gieske et al., 2016; Meijer, 2019). The active management of collaboration like selecting and evaluating partners, assessing partner’s resources as well as implementing inter-organizational routines for leveraging network resources help to build the focal organizations’ innovation capacity (Weber & Heidenreich, 2018). According to the literature, both boundary spanning and relationship management are able to better build innovation capacity from collaboration.

First, boundary-spanning refers to management activities that consistently identify potential actors and engage them in networking opportunities to establish new relations with a diverse range of external actors. The innovation literature suggests that it allows organizations to acquire new resources to augment their internal resources, and as a result, to increase their internal variety to enhance the innovation capacity (Ze et al., 2018). As the environmental trends are
dynamic and often changes the knowledge and skills needed for innovation, boundary-spanning effort enables organizations to update their internal knowledge more quickly by constantly connecting with external partners in the cutting-edge fields (Weber & Heidenreich, 2018). This enables organizations to align their innovation capacity with the needs of innovation driven by the external context.

Second, relationship management refers to investing in the build-up of stakeholder relationships to establish mutual trust, shared goals and commitment, and collaboration routines among multiple actors. According to the innovation literature, regular network meetings for structuring complex inter-organizational collaboration helps to increase the level of trust in knowledge exchange and develop common ways of understanding and articulating knowledge (Saenz & Perez-Bouvier, 2014). Formal contracts are made at the start of the collaborative innovation project for a commitment of trust in such a complex setting (Olsson et al., 2010). Those formal mechanisms enable partners to build rules and guidelines for collaboration in the innovation network and ensure equal power distribution between the participants for continuous resource exchange to build innovation capacity (Weber & Heidenreich, 2016).

1.3.4 Knowledge and learning

The literature suggests that innovation capacity often depends on how well organizations can enhance and manage their own knowledge through ongoing organizational learning and reflection for the purpose of generating new ideas and solutions (Boukamel et al., 2019; Gieske et al., 2016). By importing external knowledge as well as exploiting existing knowledge, organizations break their inertia, increase new and different technological skills with existing ones, and broaden the available assets that enhance innovation capacity in organizations (Carmona-Lavado et al., 2010; Lopez-Nicolas & Merono-Cerdan, 2011). The literature shows
knowledge absorption, knowledge sharing, and learning orientation are three sub-categories of determinants commonly mentioned that help to build innovation capacity in organizations. Table 2.4 shows determinants in three sub-categories of knowledge.

### Table 2.4 Knowledge and learning determinants

<table>
<thead>
<tr>
<th>Sub-category</th>
<th>Determinants</th>
<th>Description</th>
<th>Reference</th>
</tr>
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<tbody>
<tr>
<td>Knowledge absorption</td>
<td>Potential absorptive</td>
<td>Comprises knowledge acquisition and assimilation capabilities to recognize, value and acquire the external knowledge and to understand, analyze, interpret and include information from external sources</td>
<td>(Donate &amp; Guadamillas, 2011; Liu et al., 2017)</td>
</tr>
<tr>
<td></td>
<td>Realized absorptive</td>
<td>Comprises knowledge transformation and application capabilities to facilitate the transfer and combination of existing knowledge with newly acquired and assimilated knowledge and to apply new external knowledge commercially to achieve organizational objectives</td>
<td>(Berghman et al., 2013; Donate &amp; Guadamillas, 2011; Liu et al., 2017)</td>
</tr>
<tr>
<td></td>
<td>Knowledge collection</td>
<td>The process of obtaining knowledge from other individuals via a consultation or to persuade and invite other individuals to be willing to share their knowledge</td>
<td>(Gunu &amp; Ajayi, 2015; Lin, 2007; Stelmaszczyk, 2020)</td>
</tr>
<tr>
<td></td>
<td>Knowledge donation</td>
<td>The process of bringing or providing knowledge through communication between individuals.</td>
<td>(Gunu &amp; Ajayi, 2015; Lin, 2007; Stelmaszczyk, 2020)</td>
</tr>
<tr>
<td>Learning orientation</td>
<td>Commitment to learn</td>
<td>The extent to which a firm value and promotes learning</td>
<td>(Calantone et al., 2002; Yang, 2012)</td>
</tr>
<tr>
<td></td>
<td>Shared vision</td>
<td>An organization-wide focus on learning among employees</td>
<td>(Calantone et al., 2002; Ganguly et al., 2019)</td>
</tr>
<tr>
<td></td>
<td>Open-mindedness</td>
<td>The willingness to critically evaluate the organization’s operational routine and to accept new ideas</td>
<td>(Calantone et al., 2002; Ganguly et al., 2019)</td>
</tr>
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</table>

**Knowledge absorption**

Knowledge absorption, or absorptive capacity, refers to “ability to recognize the value of new and external information, assimilate it and apply it for commercial purposes and for its critical innovative capabilities” (Cohen & Levinthal, 1989). It enables organizations to have access to knowledge and resources that cannot be generated internally, develop a diverse knowledge base, upgrade their core competencies, and thus increase their capacity to conduct innovation activities (Fores & Camison, 2011; Wuryaningrat, 2013). Scholars argue that
organizations with higher levels of absorptive capacity are less likely to miss the opportunities created by emerging market demands as they have the ability to understand and anticipate customer needs, new technologies, and new market trends (Aljanabi, 2018; Berghman et al., 2013). In the public sector, when an organization is able to learn, it is more likely to absorb accommodate ways of doing things and opinions which are prerequisites for innovation (Hartley & Rashman, 2018). Knowledge absorption allows codification of collective knowledge, and improving managerial skills, through which public organizations improve their strategic and operating routines to build innovation capacity (Gieske et al., 2016).

The literature has divided knowledge absorption into two complementary components: potential absorptive capacity (acquisition and assimilation) and realized absorptive capacity (transformation and application) (Cohen & Levinthal, 1989; Fores & Camison, 2011; Zahra & George, 2002). First, scholars find that acquiring new knowledge helps to build innovation capacity in organizations by enabling deviations from existing heuristics in the organizational knowledge base. It helps to identify new market trends and to enter new strategic domains for innovative products and processes (Fores & Camison, 2011; Stelmaszczyk, 2020) by scanning the external environment (Berghman et al., 2013). Further, knowledge assimilation combines external knowledge with an existing knowledge base, stimulates critical reflections on current knowledge, and creates a new shared knowledge base to increase innovation efforts (Donate & Guadamillas, 2011). This helps to reflect upon multiple hypotheses, when external knowledge is path-breaking, to further enhance the pluralism of new ideas in organizations to build innovation capacity (Liu et al., 2017).

Second, for innovation to really occur, knowledge content should be further transformed and applied. Some studies find that some firms may be able to acquire and assimilate external
knowledge but may fail to transform and apply this knowledge. Consequently, they are not able to maximize the potential of new knowledge to develop new products or services and thus fail to build innovation capacity in organizations (Alavi & Leidner, 2001; Gold et al., 2001). Camisón and Forés (2010) find that innovation capability is influenced by both external learning capacity (knowledge acquisition) and internal learning capacity (knowledge application). Therefore, knowledge transformation and application are needed to renew organizational structure, procedures, skills (competencies), and/or business models so that innovation capacity could be upgraded for new needs of innovation (Doz & Kosonen, 2010).

**Knowledge sharing**

Knowledge sharing refers to the process through which organizational actors—teams, units, or individuals—exchange, receive, and are influenced by the experience and knowledge of others (Van Wijk et al., 2008, p. 832). Such sharing enables more effective transformation and application of knowledge that stimulates a faster problem-solving and quicker response to the changes in the business environment, which is critical to innovation capacity (Akhavan & Hosseini, 2016; Le & Lei, 2019). Wuryaningrat (2013) has found that knowledge sharing allows employees to discuss their individual learning in more depth so that they have a mutual understanding of the knowledge to have a common ground for more effective cooperation in the development of innovation. This further leads staff to integrate knowledge residing in different parts of the organization and to cross-fertilize more new ideas (Huang, 2011; Wang et al., 2020; Yaghoubi et al., 2017).

Knowledge sharing includes both knowledge donation and collection to increase the organizational stock of available knowledge, skills, and experiences for new ideas and new opportunities for innovation (Gunu & Ajayi, 2015; Siddiqui et al., 2019). First, knowledge
donation aims to see individual knowledge become a group and organizational knowledge over time, which in turn improves the stock of knowledge available to the organization. Podrug et al. (2017) show that knowledge donation in IT companies helps employees to have more knowledge within groups and they are able to learn more new insights to generate new ideas and develop new business opportunities, thus building innovation capacity. Second, knowledge collection enables an organization with proficiency in gathering and integrating knowledge, which is more likely to be unique, rare, and difficult for rivals to replicate, and hence has the potential to sustain high levels of innovation capacity in organizations (Akhavan & Hosseini, 2016; Stelmaszczyk, 2020).

**Learning orientation**

A learning-oriented organization develops the organization-wide activity of creating and using knowledge to enhance competitive advantage. It has a strong commitment to learning, a shared vision among employees, and open-mindedness (Calantone et al., 2002). Studies show that those organizations are able to incorporate new information from the customers and competitors that are transformed into unique knowledge to further build innovation capacity to design new products or services (Podrug et al., 2017; Wu & Nguyen, 2019). In the literature, learning orientation is comprised of three components: commitment to learning, shared vision, and open-mindedness.

First, commitment to learning refers to the extent to which an organization values and promotes learning. An organization committed to learning builds feelings of confidence and provides support to organizational members for proposing new ideas that depart from existing practices and allocate resources to acquire and implement them (Fores & Camison, 2011). Studies show that a firm committed to learning is more likely to own state-of-the-art technology,
and in turn, this results in a high level of innovation capacity (Gunu & Ajayi, 2015; Yang, 2012), since it proactively monitors and absorbs new knowledge from outside organizations. Leaders build a common understanding of the learning process, articulate a strategic view of learning, and create a climate of egalitarianism, trust, and empowerment so that employees become more creative and willing to learn and share their personal knowledge capital with colleagues (Fores & Camison, 2011).

Second, a shared vision refers to an organization-wide focus on learning among employees. It entails bringing the organizational members together around a common identity, shared strategic goals, and coordinated tasks and work contributing to attaining them (Calantone et al., 2002; Fores & Camison, 2011). Those scholars find that a shared vision helps to create a clear direction for learning that coordinates the focus of various parts of the organization and enhances the quality of learning (Aziz & Omar, 2013; Ganguly et al., 2019). Otherwise, learning motivation remains at low levels and employees are not even aware of what they have to learn (Stelmaszczyk, 2020). Employees with shared working problems or concerns are found more willing to share knowledge and to find creative ways that help all concerned improve their knowledge and skills for innovation (Donate & Guadamillas, 2011; Lopez-Nicolas & Merono-Cerdan, 2011).

Third, open-mindedness refers to the willingness to critically evaluate the organization’s operational routine and to accept new ideas. Scholars suggest that to maintain innovation capacity, organizations need to cope with rapidly changing technology and turbulent environment, where the rate of knowledge obsolescence is high in most sectors (Calantone et al., 2002). Stelmaszczyk (2020) argues that being open-minded also means learning from the past. The study show that it is instructive to question the existing assumptions or procedures in the
organizations and to unlearn old ways as it is to renew or update the knowledge base so that organizations could build a high level of innovation capacity along the way.

2. Innovation Labs in the Public Sector

Innovation labs are one type of government organizations established to encourage public sector innovation. In this section, I first discuss various definitions of those innovation labs in the literature and give the definition for the rest of the study. Further, the review identifies the main purposes and diverse practices of those innovation labs. Finally, the review discusses the innovation capacity of those innovation labs and identifies the research gap.

2.1 Definition of Innovation Labs

In the literature, multiple terms appeared in the literature that refer to similar innovation labs (Kieboom, 2014; Williamson, 2015b), such as “innovation lab” (Tõnurist et al., 2017), “government innovation lab” (Acevedo & Dassen, 2016), “policy lab” (Fuller & Lochard, 2016), “public innovation lab” (Osorio et al., 2019), or “public and social innovation lab” (Kieboom, 2014; Williamson, 2015b). Table 2.5 shows some examples of the terms and definitions applied in the current literature.

**Table 2.5 Terms and definitions of innovation labs in the public sector**

<table>
<thead>
<tr>
<th>Term</th>
<th>Definition</th>
<th>Reference</th>
</tr>
</thead>
<tbody>
<tr>
<td>Innovation Lab</td>
<td>Innovation labs are dedicated organizations created for public-sector innovations.</td>
<td>(Tõnurist et al., 2017)</td>
</tr>
<tr>
<td>Innovation Lab</td>
<td>Innovation labs are organizational tools for improving local governments’ innovation capacity.</td>
<td>(Timeus &amp; Gascó, 2018)</td>
</tr>
<tr>
<td>Innovation Lab</td>
<td>Innovation labs are an organizational response to create dedicated safe spaces and catalysts for collaboration on innovation across units, departments, and sectors.</td>
<td>(Carstensen &amp; Bason, 2012)</td>
</tr>
<tr>
<td>Innovation Lab</td>
<td>Innovation labs are semi-autonomous organizations that engage diverse participants - on a long-term basis - in open collaboration for the purpose of creating, elaborating, and prototyping radical solutions to open-ended systemic challenges.</td>
<td>(Gryszkiewicz et al., 2016)</td>
</tr>
<tr>
<td>Government Innovation Lab</td>
<td>Government innovation labs are dynamic places that stimulate creativity for the design of public policy solutions.</td>
<td>(Acevedo &amp; Dassen, 2016)</td>
</tr>
</tbody>
</table>
### Table of Innovation Lab Terms

<table>
<thead>
<tr>
<th>Term</th>
<th>Definition</th>
<th>Reference</th>
</tr>
</thead>
<tbody>
<tr>
<td>Public Sector Innovation Lab</td>
<td>PSI labs are any unit or team that was established for the purposes of supporting public or social innovation.</td>
<td>(Lewis et al., 2019; McGann, Lewis, et al., 2018)</td>
</tr>
<tr>
<td>Public Innovation Lab</td>
<td>Public innovation labs are trans-disciplinary collaborative spaces where professionals from different sectors coexist to create a mature democratic sphere, working together with the government and other key stakeholders.</td>
<td>(Unceta et al., 2019; Westley et al., 2012)</td>
</tr>
<tr>
<td>Public and Social Innovation Lab</td>
<td>They are institutions using experimental methods to design or discover new ways of working that address social and public needs.</td>
<td>(Mulgan, 2014)</td>
</tr>
<tr>
<td>Policy Innovation Lab</td>
<td>Policy innovation labs are an organizational hybrid combining elements of the political think tank, media production, disciplinary expertise in social and political science, and digital R&amp;D.</td>
<td>(Williamson, 2015b)</td>
</tr>
<tr>
<td>Policy Lab</td>
<td>Policy Labs are dedicated teams, structures, or entities focused on designing public policy through innovative methods that involve all stakeholders in the design process.</td>
<td>(Fuller &amp; Lochard, 2016)</td>
</tr>
</tbody>
</table>

Despite the use of different terms, scholars have defined innovation labs quite similarly. They seem to agree that public sector innovation labs are, first of all, established units, teams, entities, or organizations rather than “one-off events, or time-limited projects” (Puttick et al., 2014). They have their own purposes, principles, staff, structure, process, and funding for innovation activities (Kieboom, 2014; Tõnurist et al., 2017). They include “units within government, or the public sector, as well as non-government organizations and labs that work with governments on public sector innovation” (Lewis et al., 2019). Second, those organizations see innovation in the public sector as their main task and organizational purpose (Acevedo & Dassen, 2016; Timeus & Gascó, 2018). It aims to stimulate creativity in the design of solutions to public problems and improve governments’ innovation capacity for disruptive, potentially systems-tipping solutions (Kieboom, 2014; Torjman, 2012).

Further, some scholars start to refine their definition of innovation labs in the public sector by specifying the features of those units. For instance, some definitions of innovation labs emphasize the adoption of collaborative approaches to innovation (Carstensen & Bason, 2012;
Wascher et al., 2018). Others, instead, conceptualize innovation labs more broadly as units using diverse methods inspired by different disciplines that are not traditionally involved in the public sector, not limited to collaborative approaches (Piffre & Soutullo, 2017; Williamson, 2015b). A few scholars conceptualize innovation labs in terms of their features as a “safe space” or “infrastructure” for public sector innovation, which emphasizes the resources, facilities, and culture of innovation labs dedicated to promote public sector innovations (Osorio et al., 2019). This may result in using the same term with different specifications among scholars.

In this study, I conceptualize innovation labs in the public sector with elements those previous definitions commonly refer to. This study defines innovation labs as organizations, units, or entities established for the purpose of developing and supporting public sector innovation for public and social needs. This definition depicts key aspects of purposes in those innovation labs as well as allows variations in the practices of those labs.

2.2 Purpose of Innovation Labs in the Public Sector

Generally speaking and by definition, the purpose of innovation labs is to encourage innovation in the public sector (Bason & Colligan, 2014; Colligan, 2014). Scholars find that there exists a common goal among innovation labs to achieve public sector innovation aimed at solving social problems in specific contexts (Criado et al., 2020; Fuller et al., 2016). They are created in response to the need for innovation in the public sector (Lewis, 2020). They work across the spectrum of innovation—from focusing on incremental improvements to aiming for radical transformations (Puttick et al., 2014). Despite the common purpose, the literature has shown four different paths (or priorities) that innovation labs take to achieve innovation in the public sector: (1) generating solutions to specific public or social problems; (2) involving
external actors in collaborative innovation; (3) initiating systemic change or transformation; (4) developing the skills and mindsets of mainstream government departments.

According to the literature, most innovation labs aim to generate new solutions to specific problems prioritized by government organizations, developing usable and scalable solutions, often in collaboration with colleagues in government agencies (Puttick et al., 2014; Tõnurist et al., 2017). Those innovation labs usually are not specialized or geared towards a specific type of policy or service within their specific structure (Fuller & Lochard, 2016; Olejniczak et al., 2019). The thematic scope of labs’ actual operations varies substantially, depending on the public-sector reform trajectory and the leader’s priorities. Those trends in the innovation process are driven by technological change (ICT), user- and citizen-centric governance, and/or evidence-based policy making (Fleischer & Carstens, 2021; Roth et al., 2020). In general, those innovation labs produce programs and projects that seek to explore ideas, solve problems, and deliver a tool to develop new solutions, encourage experimentation, co-creation, data generation, and data use to stimulate creativity in the innovation process (Acevedo & Dassen, 2016; Criado et al., 2020; Nesti, 2018).

Second, the literature suggests that innovation labs not only collaborate with colleagues inside government but also bring citizens, nonprofits, and private sector actors together with government officials to devise innovative solutions to specific social and economic challenges (Piffre & Soutullo, 2017; Puttick et al., 2014). These innovation labs focus on opening up government to voices and ideas from outside the system, often adapting the open innovation and challenge-led approaches more commonly seen in the private sector and making use of strong communications and engagement strategies. Those innovation labs connect public innovation to citizens, assigning them a role in the design and co-creation of solutions, beyond the “citizen participation.” In this sense, by creating a collaborative space to enable participants with varied
skill sets to reach a common understanding of a policy challenge, those innovation labs aim to explore design and test user-centered solutions for potential implementation across the system (Bellefontaine & Policy Horizons Canada, 2012; El-Haddadeh et al., 2013).

Third, a large number of innovation labs claim to promote innovations that drive systemic change or transformation looking beyond specific interventions to the wider policy context and complex systems (Kieboom, 2014; Puttick et al., 2014). The establishment of innovation labs is often driven by the large and pressing societal problems in the external context that government organizations face and the need for innovation and new forms of organization to deal with those multiple challenges and issues (Ferrarezi et al., 2021). In principle, innovation labs focus on systemic social problems, and target institutions, such as governments, by developing new solutions to cause “systems to tip” (Kieboom, 2014), for example in healthcare, energy, education, or digital governance (Acevedo & Dassen, 2016; Williamson, 2015b). They aim to create designs and blueprints that others can follow and implement linking changes in policy, business models, technology, and behavior.

Fourth, the literature shows that a number of innovation labs, but not many, aim to promote public sector innovation by developing the skills and mindsets of mainstream government departments (Piffre & Soutullo, 2017; Puttick et al., 2014). Those innovation labs aim to transform the way that government approaches innovation and to support the growth of an innovation culture within a government that further stimulates public sector innovation. They provide the insights and knowledge needed to empower others inside a government to achieve innovation (Bloom & Faulkner, 2016). Through conducting projects with government organizations, some innovation labs demonstrate other ways of dealing with wicked problems and help a government to build capacity (through learning by doing) that lead to public sector
innovation (Ferrarezi et al., 2021). Other innovation labs offer training on those innovation methods or tools for public employees (Acevedo & Dassen, 2016).

While the literature has identified four different paths (or priorities) of innovation labs to promote public sector innovation, most innovation labs in practice work across several of those paths, developing different methods and abilities relevant to the focus of operation required (Criado et al., 2020; Olejniczak et al., 2019). Cole (2021) found different initiatives within the same innovation lab may hold a variety of priorities. Studies of innovation labs in different locations show different combinations of those paths. For instance, the Chilean Governmental Lab aims to promote a shift toward more participatory and collaborative approaches to driving public and policy innovation (Piffre & Soutullo, 2017), as the overall innovation strategies focus on open government and open data. Instead, The Policy Lab in the UK aims to promote innovative techniques such as design-based thinking and ethnography to approach policy problems in a new way (Kimbell, 2015), reflecting a turn towards new forms of policymaking characterized by a greater emphasis on the values of empathy and creativity, and the use of abductive forms of reasoning (Bailey & Lloyd, 2016; Kimbell, 2017).

In summary, innovation labs are established to promote public sector innovation in response to the growing need for new solutions to public and social problems, either specific or systemic, in specific contexts. While four paths can be identified, most of the innovation labs in practice work across several of those paths and different innovation labs vary in selections of particular paths.

2.3 Characteristics of Innovation Labs in the Public Sector

As innovation labs have only begun to receive attention from scholars in public administration (Lewis et al., 2019; McGann, Blomkamp, et al., 2018; McGann et al., 2019;
Williamson, 2015b), most current studies focus on describing core features and practices of those labs for the purpose of encouraging public sector innovation (Lewis, 2020; Wellstead et al., 2021). They show the diverse landscape of innovation labs, given that they in practice have been set up with different organizational forms, sources of funding, approaches, or methods to explore new solutions that solve public problems (Kieboom, 2014; Mulgan, 2014; Roth et al., 2020). Among those features, scholars have commonly mentioned three aspects that characterize those innovation labs: (1) level of autonomy, (2) multidisciplinary team, and (3) approaches and methods.

### 2.3.1 Level of autonomy of innovation labs

Most of the innovation labs enjoy a certain level of autonomy as independent parts of a government organization, more or less structurally set apart from the rest of the public sector (Tõnurist et al., 2017), in spite of being government-controlled or government-enabled. According to the literature, innovation labs are financed through different models with one or multiple sources of funding from government departments and/or from external sponsorship, such as research or knowledge exchange funding and not-for-profit funding (Whicher, 2021). They have the autonomy to determine their work priorities and to pursue what they consider as relevant in producing creative ideas or insights for public policies or services, while most of their work is rarely subject to specific performance measures or strenuous evaluations (Bevilacqua et al., 2019; Lewis et al., 2019). They become less restricted by strategic plans and institutional bureaucracy and more flexible in their agenda and working methods. The autonomy and flexibility come from innovation labs’ small, fluid, and dynamic organizations with less hierarchy and a lean budget (McGann, Lewis, et al., 2018; Puttick et al., 2014).
Those labs often rely on political patronage for survival and gaining autonomy to devote time and energy to public sector innovation (Lee & Ma, 2019). The small and autonomous structures that operate somewhat outside traditional bureaucratic lines of authority make the survival of innovation labs highly contingent on ongoing political patronage as they are comparatively easy to shut down compared with more established public sector organizations (Lewis et al., 2019; Mulgan, 2014). Some innovation labs are very close to executive leadership or politicians as they are physically based in the mayor’s or president’s office, with their priorities influenced by their executive leader (Puttick et al., 2014). Proximity to leadership also gives innovation labs authority and legitimacy to galvanize engagement across the government, as well as providing protection to try new things and take risk (McGann, Blomkamp, et al., 2018).

2.3.2 A multi-disciplinary team of staff

Innovation labs often employ a team of staff with multi-disciplinary backgrounds (Kieboom, 2014; Puttick et al., 2014). This feature seems to be driven by the complexity and multifaceted nature of public problems those innovation labs want to develop innovative solutions to (Holierhoek & Price, 2019). Public problems solving seldom fall within the boundaries of one domain knowledge. It also seems relevant to innovation process where a variety of skillsets are regarded as necessary to generate new ideas and initial designs for the development of public sector innovation (Criado et al., 2020).

In terms of their composition, they often have a team with experience in both the private and public sectors. They hire a mix of people with backgrounds not traditionally found in the public sector, such as designers, anthropologists, social geographers, engineering, anthropology, psychology, data science, law, economics, sociology, design, history, advertising, journalism, among others (Acevedo & Dassen, 2016). There are also staff with backgrounds from traditional
fields, including political science, economics, and law that are core to the creation of new solutions to public problems (Tõnurist et al., 2017). In particular projects, innovation labs’ core team may be accompanied by a collective “from the system”: end-users, service providers, and policymakers to make sure one resembles a “real system” (Kieboom, 2014).

2.3.3 Methods of innovation labs

Innovation labs are often distinguished from other forms of government teams or organizations given that they have the autonomy to try different innovation methods to tackle public problems (Bason & Colligan, 2014; Puttick et al., 2014). Different combinations of innovation methods are often applied (Lee & Ma, 2019; Olejniczak et al., 2019), including future strategic thinking and foresight, human-centered design thinking, ethnographies and visualization, and innovation challenge design (Kieboom, 2014; Roth et al., 2020). They make them into powerful sets of “governing resources” to understand social problems, get inside the public perspective, and generate insights and ideas for future policy interventions and practices of governance (Williamson, 2015a, 2015b). Those new methods or tools are suggested at the center of innovation labs’ activities, being essential to achieving real changes in the operational dimension of public sector organizations (Criado et al., 2020).

Among those methods and tools, the literature suggests three main types of methods being applied by innovation labs. First, “design thinking” is reportedly favored by those innovation labs as it focuses on identifying and testing proposals and solutions as a way of contributing to the policy and service process (Kimbell, 2015; Lewis, 2020; Mulgan, 2014). It includes five stages (i.e., empathizing, definition, ideation, prototyping, and testing). It remains a focal method of many innovation labs, with some proponents going so far as to suggest that the role of innovation labs is “to create motivation and commitment to design thinking for policymaking”
(McGann, Blomkamp, et al., 2018; Thorpe & Rhodes, 2018). While not as popular as design thinking, a number of innovation labs also use behavioral insights, another group of methods that has also proliferated rapidly around the world, in combination with other approaches (Lewis, 2020; Olejniczak et al., 2019). The use of such tools is associated with the growing interest in evidence-based policymaking (Fuller & Lochard, 2016). The third group of methods is data-driven, which refers to innovative approaches in data analytics such as applying new digital and web-based tools to open up and interrogate public data. This is found driven by the recent pursuit of “open government” agendas and the application of data science in the public sector (Acevedo & Dassen, 2016; McGann, Blomkamp, et al., 2018).

The literature on innovation labs finds that design-thinking process is often associated with collaboration (Villa Alvarez et al., 2022; Whicher, 2021). Innovation labs are often portrayed as a space that elicits active participation from the community as well as collaboration with stakeholders both within and outside government organizations to generate public sector innovation (McGann, Blomkamp, et al., 2018; Olejniczak et al., 2019; Roth et al., 2020; Unceta et al., 2019). With innovation labs being permanent units cutting organizational boundaries, they can establish contact with civil servants, authorities, activists, and other organized civil society through both formal and informal mechanisms, avoidance of classic challenges of bureaucratic functional differentiation and specialization, most notably turf wars and blind spots (Brock, 2021; Ferreira & Botero, 2020; Lindquist & Buttazzoni, 2021). In principle, innovation labs take end-users as the leading experts and promote the co-creation of products and services from design to testing through the involvement of different communities (Lee & Ma, 2019). Those users range from ordinary citizens who use public services to those with expertise in providing key insights
to design products or services. The needs of the end-user are steering the direction of the work process to make sure the solutions are covering their needs (Kieboom, 2014).

2.4 Innovation Capacity in Innovation Labs

In the literature, innovation labs are often assumed to have enough innovation capacity to encourage public sector innovation (Acevedo & Dassen, 2016; Vrabie & Ianole-Călin, 2020). Scholars suggest that as innovation labs are often structurally separated from the other bureaucratic parts of government, they are shielded from rigid structure of public bureaucracies and risk-aversion culture which may block different thinking, refuse new methods, and foster resistance to change and reluctance to accept innovation (Carstensen & Bason, 2012; Scholl & Kemp, 2016). Innovation labs become a “safe space” that allows more experimentation, risk-taking, and failure than their traditional counterparts to stimulate public sector innovation (Acevedo & Dassen, 2016; Bloom & Faulkner, 2016; John, 2014). In those innovation labs, new competencies or skills for innovation and innovation-oriented resources, structure, or culture can be developed without the interruption of mindsets that required for stable, daily operations and service delivery in the rest of the government (Bevilacqua et al., 2019; Bloom & Faulkner, 2016). It affords flexibility that traditional public sector bureaucracies do not have to try new techniques and disrupting methods conducive to public sector innovation (Lewis, 2020). Being a dedicated unit or structure for public sector innovation, those innovation labs are assumed to have innovation capacity without disrupting the traditional bureaucratic structure (Fuglsang & Hansen, 2021; Torvinen & Jansson, 2022).

Other scholars argue that innovation labs have innovation capacity by showing their outputs, such as new knowledge, ideas, or prototypes, to inform public sector innovation (Kimbell, 2015, 2017; Miyao et al., 2022). First, for public problems known to governments, they develop quick
answers and a clear project scope definition to deconstruct initial solutions and propose new ones through quick idea iteration (Ferrarezi et al., 2021; Haug & Mergel, 2021; Hinrichs-Krapels et al., 2020). Innovation labs’ agile methodologies and the flexibility of the process help to create new ideas and proposals to “jump-start” user-driven service redesigns or prototypes (Tõnurist et al., 2017). This lean and start-up type of structure enables much quicker communication among government staff and diverse perspectives easily shared so that “out-of-box thinking” could emerge for new ideas or solutions to public policies and services problems (Bevilacqua et al., 2019; Bloom & Faulkner, 2016).

Second, innovation labs have the expertise in methods to get inside the public perspective and propose new problems in public services and public policies (Piffre & Soutullo, 2017). They explore and propose alternative ways to achieve and deliver services, feeding into the process of service innovation and transformation, where a particular issue is not ready to be on the policy agenda (Hinrichs-Krapels et al., 2020; Scholl & Kemp, 2016). Innovation labs re-order the hierarchy of evidence and enable more open thinking and quicker insight building for new policy problems that have not been discussed before and for new ideas that fit within the user’s worldview and behavior (Bloom & Faulkner, 2016; Holierhoek & Price, 2019).

Third, innovation labs open up mindsets of public employees to discuss possible future visions by bringing in different sets of experience, concerns, information, and knowledge from outside government to the innovation process (Ferrarezi et al., 2021; Höflehner et al., 2016). Some scholars show that they foster a new idea of solutions to complex social problems by breaking down traditional models of public administration where responsibility for policy design is monopolized by public officials (Evans & Cheng, 2021; Nesti, 2018). Others show innovation labs manage to foster foresight and collective vision building to push the frontiers of emerging
technologies for public policy making, such as blockchain or artificial intelligence (S. Kim et al., 2022; Pólvora & Nascimento, 2021). Innovation labs have the strength in opening up possibilities where there is little received wisdom and not many rules (Ferreira & Botero, 2020; Kimbell & Bailey, 2017) and to facilitate public-sector-wide changes when new ideas fit with the constraints and realities of policymaking (Komatsu et al., 2021).

Despite innovation labs are assumed to have innovation capacity by most scholars, there is a limited number of studies that explore what determines innovation capacity in those labs (Bevilacqua et al., 2019; Vrabie & Ianole-Călin, 2020). The existing studies scrutinize specific aspects of innovation capacity in those innovation labs, yet very few studies have conducted a structured and comprehensive examination of innovation capacity in the lab situation. Most of those studies focus on the aspect of resources for innovation capacity in innovation labs, such as human resources (Bevilacqua et al., 2019; Timeus & Gascó, 2018), financial resources (Haug & Mergel, 2021; Vrabie & Ianole-Călin, 2020; Whicher, 2021), and technological resources (e.g., Bevilacqua et al., 2019; Vrabie & Ianole-Călin, 2020). Other aspects of innovation capacity have been less explored such as leadership inside and outside labs (Haug & Mergel, 2021; Lehtinen, 2022), organizational culture, (Komatsu et al., 2021), or knowledge management (Seravalli, 2021; Timeus & Gascó, 2018). There still lacks a comprehensive understanding of innovation labs’ innovation capacity. To further understand the topic, more exploration is needed to show how other dimensions of determinants might influence their innovation capacity.

Furthermore, effects of resources on innovation capacity in innovation labs seem inconsistent across current studies. For instance, both Vrabie and Ianole-Calín (2020) and Bevilacqua et al. (2019) show that data management tools and skills are critical to innovation capacity in the labs since those tools allow lab staff to generate new insights from administrative data trends that
have not been discovered before. Yet, Timeus and Gascó (2018) show that innovation labs did not emphasize a central role of information technology in the innovation process given their organization’s overall policy goals and innovation strategy. In another example, most scholars seem to agree that a lab needs sufficient financial resources to have innovation capacity (Whicher, 2021) and budget constraints are one of the most important challenges (Ferreira & Botero, 2020; Lewis, 2020). However, Haug and Mergel (2021) show lack of financial resources is not necessarily a barrier. Instead, a small budget motivated the participants of one of the studied labs to find creative solutions. More studies seem necessary to explore the importance and the influence of those determinants on the innovation capacity in innovation labs to resolve the inconsistency in those findings and the disputes among scholars.

In this regard, our knowledge is still limited about the determinants in the innovation labs that influence their innovation capacity. Most scholars have described the characteristics of innovation labs and assume innovation labs have innovation capacity. Yet, they do not fully explain what determines innovation capacity in innovation labs. Even though some studies have explored specific determinants of innovation labs, there still is a lack of a comprehensive examination of all dimensions of innovation labs’ innovation capacity. While some scholars have developed a framework based on innovation management and innovation system literature about private sector innovation, there is not enough empirical examination on how those identified determinants influence innovation capacity in government organizations. The importance of specific determinants may not be the same to influence innovation capacity in innovation labs. In this regard, more research on innovation labs is needed to explore other key dimensions to fully understand their innovation capacity. Based on the above literature review, I refine the research
question: What are the key determinants and how do they influence innovation capacity in innovation labs?
This study aims to further examine the key determinants of innovation capacity in innovation labs. This section of the research design explains the epistemology this study follows, the research design of this study, and specific methods of data collection and analysis.

1. Epistemology and Methodology

This study follows positivism philosophy to guide the research design. The idea that there is an external reality that can be described and explained objectively and in a value-free manner is the key tenet of positivism (Turner, 2001). Positivists believe in empiricism; observation and measurement are the core of the scientific endeavor in this paradigm. In positivism, phenomena are described. It adheres strongly to the rules of formal logic and scientific method, with a hypothesis being confirmed or rejected on the basis of data. Humans are biased in their perceptions of reality and that hence we can approach the truth of reality but can never reach the absolute truth (Mills et al., 2010). Knowledge is relative and shaped by a variety of factors, including the cognition of the subject and social and cultural conditions, as well as symbols and their interpretations. Instead of relying on a single method, positivism draws on multiple methods of observation. These different methods are applied in an attempt to correct for problems of validity and bias.

The positivism philosophy is followed to guide this study for the following reasons. First, an innovation lab is a social phenomenon and there is an external reality about key determinants of innovation capacity in those labs to be described and explained. The determinants of innovation capacity can be observed in those innovation labs and can be measured by a set of indicators identified in the literature. The influence of those determinants on innovation capacity can be
formulated into propositions that are further examined with systematically collected data. Therefore, researchers can understand innovation capacity in those labs through deductive empirical investigation. In this sense, the central tenet of positivism fits well with the nature of this study in that it tries to discover what determinants and how they influence innovation capacity.

However, as a researcher and observer, I recognize potential bias I could have because of my personal belief in public sector innovation and life experience in the non-U.S. region. Researchers being value neutral to achieve objectivity is critical in the positivism philosophy to create scientific knowledge through empirical data. I need to become sensitive to cultural values and the relevance of meaning for action so that I as a researcher can be separated from the observations. To improve the object of research, multiple methods across disciplines are recommended in conducting the research to make use of triangulation. These different measurements are used in an attempt to correct for problems of validity and bias (Little, 2020).

2. Research Design: Multiple Case Study

To answer the research question, this study uses a case study research design. First, in general, “a case study is a methodological approach that involves the in-depth exploration of a specific bounded system, utilizing multiple forms of data collection to systemically gather information on how the system operates or functions” (Mills et al., 2010). Case studies show how particular practices are developed in specific organizations, which is particularly useful to respond to questions related to why or how (Yin, 2009) and, therefore, help refine theory (Scapens, 1990). They also allow scholars to study the research questions in depth while leaving room for unexpected, interesting findings that can form the basis for specific hypotheses to be tested in future research (Marshall & Rossman, 2014; Yin, 2009). Second, case study approach is
suitable to investigate distinct phenomena characterized by a lack of detailed preliminary research. In this study, given that innovation labs in the public sector are a relatively new field of public administration and knowledge is still limited about the determinants of their innovation capacity, the case study approach fits well with the purpose and research questions of this study.

This study follows a theory-guided case study design (Kaarbo & Beasley, 1999; Levy, 2008). In such a case study, researchers aim to interpret or examine a particular case with guidance of some theories. The analysis on those cases is explicitly structured by a well-developed conceptual framework that focuses attention on some theoretically specified aspects of reality (Eckstein, 2009). In this dissertation, the focus is on the innovation capacity in innovation labs. To interpret the key determinants of innovation capacity, I developed a theoretical framework based on organizational capacity to guide my examination of innovation labs in the city governments in the U.S. I further examined those innovation labs along the determinants of four dimensions to understand whether and how they influence innovation capacity in innovation labs. It allows me to reveal the key determinants in the innovation labs and to interpret mechanisms to influence innovation capacity. It also allows me to examine the importance of those determinants and how they might interact with each other to influence innovation capacity in those innovation labs in the public sector.

Further, in this study, a multiple case study design is applied. A multiple case study examines several instrumental bounded cases are selected to develop a more in-depth understanding of the phenomena (Yin, 2009). According to Miles and Huberman (1994), this form of case study allows for in-depth exploration of a single case to identify key determinants that are patterned in each innovation lab and compares determinants across cases for a more generalizable interpretation of innovation capacity in those innovation labs. Case comparison is able to yield
consistent findings about determinants of innovation capacity across multiple cases or is able to explain logically why those determinants are inconsistent in different labs (Eckstein, 2009). As innovation labs appear to have different features or practices to pursue public sector innovation, investigating multiple innovation labs develops more extensive descriptions and a richer understanding of a phenomenon than a single case can provide.

3. Case Identification and Selection

To identify and select comparable cases for this study, I first conducted an environmental scan to find innovation labs working for local governments in the U.S. I reviewed the lists of labs identified in previous review articles, working papers, practitioner reports, and maps of the field. Those papers and articles include academic papers (Gryszkiewicz et al., 2016; McGann, Blomkamp, et al., 2018; Tõnurist et al., 2017; Wellstead & Nguyen, 2020), practitioner reports (Puttick et al., 2014), and maps of the field (GOV INNOVATION LABS Constellations, 2013; “Labs, ITeams, Designers,” 2016). This initial search resulted in 31 innovation labs established in the local governments that fit with the definition in this study. To confirm whether those innovation labs are still active, I further searched for their official websites to see their current status. The result shows that 20 of those innovation labs are still active, while eight of them are inactive and three of them are combined with the department of information technology in the local government. Those innovation labs are considered to have innovation capacity to encourage public sector innovation in local governments.

To select comparable cases, it is suggested researchers should choose cases in an effort to control for known and suspected alternative explanations of the results under investigation (Kaarbo & Beasley, 1999). Therefore, among 20 innovation labs, I further examined the form of government, government leaders’ political party, population size, and cities’ level of
innovativeness\(^1\) where innovation labs are embedded in. Those aspects are important to be comparable as the literature suggests that innovation labs’ legitimacy and resources for public sector innovation is influenced by political leaders’ attitude and authority (Lee & Ma, 2019) and that innovation labs’ resources are also influenced by availability of resources for innovation inside and outside government (McGann, Blomkamp, et al., 2018; Olejniczak et al., 2019; Roth et al., 2020; Unceta et al., 2019). Cases were selected that were comparable in those aspects to control for variation.

Based on the above criteria, I identified nine innovation labs that were comparable with publicly available information from innovation labs’ official websites, city governments’ websites, and census data. I then reached out to the director of innovation labs to acquire research access in May 2021. Among nine cases, six of them responded. Four of them granted research access, while two of them declined. In September 2021, one innovation lab dropped out of the research due to a change in the director of the lab. Eventually, the three selected innovation labs are (1) Boston Mayor’s Office of New Urban Mechanics (MONUM), (2) Seattle Innovation and Performance Office (IP), and (3) Minneapolis Office of Performance and Innovation (OPI).

<table>
<thead>
<tr>
<th></th>
<th>Boston MONUM</th>
<th>Minneapolis OPI</th>
<th>Seattle IP</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>City population size(^2)</strong></td>
<td>675,647</td>
<td>429,954</td>
<td>737,015</td>
</tr>
<tr>
<td><strong>City government form</strong></td>
<td>Mayor-council</td>
<td>Mayor-council (weak mayor)(^3)</td>
<td>Mayor-council</td>
</tr>
<tr>
<td><strong>Mayor’s political</strong></td>
<td>Democratic</td>
<td>Democratic</td>
<td>Democratic</td>
</tr>
</tbody>
</table>

\(^1\) This study uses Innovation Cities™ Index 2018 which measures conditions for innovation in cities. The Index captures the cultural assets, human infrastructure, and networked markets to measure cities’ conditions for innovation.

\(^2\) The population information is from the United States census of 2020.

\(^3\) The government form in the City of Minneapolis changed to strong mayor-council after voters approve the chart amendment in December 2021.
<table>
<thead>
<tr>
<th>party</th>
<th>Boston MONUM</th>
<th>Minneapolis OPI</th>
<th>Seattle IP</th>
</tr>
</thead>
<tbody>
<tr>
<td>Innovation city ranking (2018)</td>
<td>4</td>
<td>22</td>
<td>7</td>
</tr>
<tr>
<td>Total number of projects</td>
<td>42</td>
<td>6</td>
<td>12</td>
</tr>
<tr>
<td>New projects within the past two years</td>
<td>11</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>Starting year</td>
<td>2010</td>
<td>2015</td>
<td>2017</td>
</tr>
<tr>
<td>Number of staff</td>
<td>10</td>
<td>6</td>
<td>8</td>
</tr>
<tr>
<td>Sources of funding</td>
<td>Government budget Grants from multiple foundations: Bloomberg Philanthropies; Knight Foundation; Eos Foundation;</td>
<td>Government budget Bloomberg Philanthropies</td>
<td>Government budget Bloomberg Philanthropies</td>
</tr>
<tr>
<td>Position in the government</td>
<td>Within the mayor’s office</td>
<td>Within the city coordinator’s office</td>
<td>Within the mayor’s office</td>
</tr>
<tr>
<td>Innovation methods</td>
<td>Human-centered Design Co-creation with the public Experiment and pilot</td>
<td>Data Analytics Community Engagement Human-centered Design</td>
<td>Data Science Design Approach</td>
</tr>
<tr>
<td>Collaboration</td>
<td>Internal departments Department of Neighborhood Development; Boston Planning &amp; Development Agency; Public Health Commission; Department of Public Works; Department of Transportation</td>
<td>Internal departments Office of Violence Prevention; Minneapolis Police Department; Public Health &amp; Safety Committee; Minneapolis 311; Minneapolis Health Department; City Coordinator's Office Evaluation and Performance;</td>
<td>Internal departments Department of Education and Early Learning; Seattle Department of Transportation; Seattle IT; Seattle Fire; Seattle Parks and Recreation;</td>
</tr>
<tr>
<td></td>
<td>External partners MIT Real Estate Innovation Lab; MIT Media Lab; Boston Society of Architects; Garrison Trotter Neighborhood</td>
<td>External partners Canopy Roots</td>
<td>External partners Expedia Group; F5; Tableau; Google.org; Microsoft; Facebook</td>
</tr>
<tr>
<td>Knowledge and learning</td>
<td>Boston MONUM Association (GTNA)</td>
<td>Minneapolis OPI</td>
<td>Seattle IP</td>
</tr>
<tr>
<td>------------------------</td>
<td>---------------------------------</td>
<td>----------------</td>
<td>------------</td>
</tr>
<tr>
<td>Visiting other cities for innovation experiences; Attending innovation workshops and conferences; Documentation for each innovation project</td>
<td>Attending innovation workshops and conferences; Documentation for each innovation project</td>
<td>Visiting other cities for innovation experiences; Inviting guest speakers to share knowledge; Documentation for each innovation project</td>
<td></td>
</tr>
</tbody>
</table>

According to Table 3.1, these three innovation labs are comparable in the form of government, government leaders’ political party, and population size. All three labs are embedded in a mayor-council government system led by a democratic mayor. The three city governments are slightly different in two aspects. First, they are different in terms of mayor’s political power. Minneapolis has a weak-mayor system where the mayor shares the power with the city council president and three city council members who made up the committee that together came up with proposals for the city council to approve. Boston and Seattle have a strong mayor in the city government who is elected by voters as the head of the executive branch and is given almost total administrative authority and a clear, wide range of political independence, with the power to appoint and dismiss department heads without council approval or public input. In this sense, such differences may influence the labs’ legitimacy and autonomy to pursue public sector innovation.

Second, the three cities are slightly different in the level of innovativeness in that Minneapolis is lower. Boston’s colleges and universities exert a significant impact on the regional economy and their presence makes the city highly innovative, along with the access to venture capital and the presence of many high-tech companies. In contrast, Seattle’s economy is driven by a mix of older industrial companies, and “new economy” Internet and technology
companies, service, design, and clean technology companies. In Minneapolis, its economy is based on commerce, finance, rail and trucking services, health care, and industry. It is found to be a less innovative city than Boston and Seattle. This difference may indicate a different availability of resources in the city for innovation and thus may influence how many resources innovation labs can acquire outside government for innovation, which influences their innovation capacity.

While all three innovation labs are assumed to have innovation capacity, the total number of innovation projects and updates within the past two years are different. The MONUM in Boston has the highest number of innovation projects and updates within the past two years. They are different in the experiences of conducting innovation projects, given that the MONUM has established for more than ten years. Despite the difference in the experiences, all three innovation labs are still comparable due to the following reasons. First, they all focus on the front end or early stage of innovation process to initiate innovation projects or generate new ideas. The similar purpose may require similar determinants of innovation capacity in three innovation labs. Second, all three innovation labs use multiple methods and tools in the innovation projects. The application of those methods and tools in the innovation projects may also require similar determinants of innovation capacity in three innovation labs. Finally, all three innovation labs are structurally separated from traditional bureaucracy and have a certain level of autonomy to generate new ideas.

According to the information on labs’ websites, I find how three cases are comparable along four dimensions in the analytical framework (i.e., resources, management, collaboration, and knowledge). As is shown in Table 3.1, three innovation labs are comparable in terms of their size of team and the sources of funding. They are also similar in terms of ideation process with
multiple innovation methods and tend to collaborate with internal departments. All of them have documentation of innovation projects available on their website for knowledge sharing.

However, they are different in terms of their position in the city government and collaboration with external partners. First, while both the Boston MONUM and the Seattle IP are located in the mayor’s office, the Minneapolis OPI is located in the city coordinator’s office. The city coordinator’s office is one of the largest non-electoral administrative offices in the city, while the mayor’s office may change in every electoral cycle. The different locations could further influence how close innovation lab is to political authority and how it can secure legitimacy and resources for innovation. Second, three innovation labs have different external partners. While the Boston MONUM has a variety of academic institutes and non-profit organizations as main partners for innovation, the Seattle IP seems to prioritize technological companies. The Minneapolis OPI does not seem to focus on external collaboration for innovation. Such differences may influence how innovation labs acquire external resources for innovation and thus influence their innovation capacity.

4. Operationalization and Coding Scheme

To conduct a theory-guided case study that has been based upon the construction of an analytical model, the researcher needs to operationalize the variables of this analytical model (Kaarbo & Beasley, 1999). Operationalization is the development of specific operational definitions of these variables. According to Earl (2012), the operational definitions will result in empirical observations representing the analytical model in the real world. Each analytical model component requires adequate operationalization, regardless of its use in qualitative or quantitative research. The researcher is essentially constructing a case coding scheme to guide the collection and the analysis of evidence for the variables in the study (Yin, 2009). In this study,
I aim to interpret key determinants of innovation capacity in innovation labs and particularly how four dimensions of determinants (i.e., Resources, Management, Collaboration, and Knowledge) influence labs’ innovation capacity. The operationalization of those determinants in the four dimensions is needed to empirically examine whether and how those determinants influence innovation capacity in three innovation labs.

To operationalize the determinants of innovation capacity in the four dimensions, it is suggested that the researcher needs to determine a set of indicators or topics and to formulate an appropriate set of data elicitors (Doorewaard, 2010). The researcher needs to identify recordable topics that specify in advance what is necessary for the analysis to find in the evidence to code a variable in a particular way or to make a judgment of its value (Kaarbo & Beasley, 1999). To do so, I further reviewed innovation literature and analyzed how the determinants of innovation capacity are measured. As most determinants have multiple indicators in their operational definitions, I selected those indicators that were commonly mentioned in the literature. This is recommended as operationalization should be general and application to the class of phenomena, not just to the specific cases in the literature, so that the operationalization could be applied to other cases (Babbie, 2012). As most determinants were operationalized in the private sector, I also adapted those indicators to the context of the public sector. I dropped those indicators relevant to market or competition, since they are not regarded as the main driver of public sector innovation (Cankar & Petkovsek, 2013; Demircioglu & Audretsch, 2017). I also adapted customer-orientation to citizen-orientation given that public sector innovation is often found driven by public value in addition to users’ needs (Bekkers & Tummers, 2018; Meijer, 2019). Appendix A shows the operationalization of determinants of innovation capacity.
The operationalization further leads to the construction of a coding scheme to guide the collection and analysis of evidence for the determinants of innovation capacity in innovation labs. The codes are predetermined words or phrases derived from the indicators for each determinant (Lewins & Silver, 2007). Following the analytical framework, the coding scheme was organized hierarchically with four levels. The first level is the dimensions of innovation capacity. The second level is the sub-categories. The third level is the specific determinants. The fourth level is the measures/operationalization of each determinant. Here is an example of the coding scheme of Resources. A full list of coding scheme can be found in Appendix B. This coding scheme is used to identify key determinants in each innovation lab that determines its own innovation capacity.

**Table 3.2 Example of the coding scheme of Resources**

<table>
<thead>
<tr>
<th>First level</th>
<th>Second level</th>
<th>Third level</th>
<th>Fourth level</th>
</tr>
</thead>
<tbody>
<tr>
<td>Resources</td>
<td>Human Resources</td>
<td>Employee’s level of skills and knowledge</td>
<td>high education levels and specialized training</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>highly skilled with professional experience</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>specific competencies for innovation activities</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>participation in training related to innovation</td>
</tr>
</tbody>
</table>

5. **Data Collection**

Case study research often involves extensive data collection with multiple forms of data. The data collection is pointed in focus and provides rich, detailed, and in-depth information. In this study, the data collection includes two methods: document collection and in-depth interviews.

5.1 **Document collection**

First, this study has collected relevant documents about each innovation lab. Those documents include (1) information about the lab itself and its innovation projects, (2) news reports, and (3) blog entries. Information about the lab itself refers to the organizational features
regarding their starting year, the number of staff, missions, focusing innovation areas, funding, and methods they use. Its innovation projects refer to the description of the innovation lab and the work it has been doing, which includes the purposes, activities, partners, and/or outputs of those projects. This information helped me to learn how the innovation lab acts in each project and to understand how it functions in the development of public sector innovation. It, therefore, showed whether and how the innovation lab have innovation capacity to conduct innovation projects. This information was collected through innovation labs’ official websites.

News reports about each innovation lab were also collected. Those news reports described the work innovation labs have been doing as well as the results or impacts they may have achieved. The news reports further enriched the information about specific innovation projects and thus helped to understand specific ways in which the innovation lab managed to develop innovative solutions. Some new reports showed the preliminary results of those innovation projects developed by labs. The news reports were collected through the collection on innovation labs’ official websites and through Google search. In total, I collected 35 news reports for the Boston MONUM, 23 news reports for the Seattle IP, and 20 news reports for the Minneapolis OPI.

Blog entries refer to the content posted by innovation lab members regarding the updates on innovation projects, explanations about their approaches, and reflections on their work, among others. Those blog entries provided more detailed information about specific ways in which the innovation lab operates and how it builds features, components, or toolkits to encourage public sector innovation. Such information helped to understand what the innovation lab offered to enhance innovation capacity. The blog entries were collected through the innovation labs’ official websites and through medium.com, where lab staff wrote posts and shared ideas. I
collected 45 blog entries for the Boston MONUM, 21 blog entries for the Seattle IP, and 8 blog entries for the Minneapolis OPI.

5.2 Semi-structure interviews

For each case, data were further collected through semi-structured interviews with people in the innovation labs and people working or collaborating with labs in the innovation projects. Interviews are useful when trying to collect rich data and understand the outcomes of particular activities (Fischer & Miller, 2006). The participants interviewed were selected through purposeful sampling (Yin, 2009). It was utilized because the study focused on determinants in the innovation labs’ context. Thus, participants were sampled based on their involvement in the work of innovation labs. They were interviewed to learn multiple perspectives of determinants in the innovation labs. To comprehensively examine each innovation lab, specific innovation projects as examples of lab work were discussed to learn in detail about their practices and key determinants of innovation capacity. Considering the types of participants in each innovation project, three groups of actors were interviewed: (1) Staff members in the innovation lab, (2) Staff members in the local government (outside the innovation lab), (3) Partners outside the local government. The purposeful sampling were coupled with snowball sampling to satisfy saturation (Yin, 2009). During each interview, participants were asked for recommendations of organizations and people who could provide insight into the phenomenon under study.

In the first phase, I interviewed people working directly in innovation labs to gather qualitative data on how innovation labs worked and whether innovation labs have built innovation capacity to conduct innovation projects and activities for new solutions to public services or policy problems. Those people included the director or head of the innovation lab and the staff in the lab. I first contacted the director of each innovation lab to gain research access.
After the initial introduction to the lab staff, the director referred me to the lab staff who are responsible for different innovation projects. I was able to interview lab staff with various backgrounds and tasks for public sector innovation. I interviewed four members of staff for the Boston MONUM, six members for the Seattle IP, and four members for the Minneapolis OPI. Interviews of staff inside the innovation lab explored the key determinants in the analytical framework that influenced the innovation capacity in the innovation lab.

In order to get a more balanced idea of whether and how innovation labs have innovation capacity to encourage public sector innovation, the second group of interviews with local government organizations was conducted. This group of interviews focused on people inside the local government organizations who have worked with innovation labs on specific innovation projects. I first identified a list of local government participants from the labs’ official websites. Some of those government agencies were the department of housing, department of education, department of transportation, department of public safety, fire department, department of community engagement, and department of information technology. Depending on specific projects that innovation labs have been working on, the interviewees from government agencies may vary. Then, I gained access to research participants through cold-emailing and through the connections of other participants. Interviews with lab staff also recommended additional people in the local government who might provide insights on this topic. Seven interviews were conducted with government staff in Boston, five interviews with government staff in Seattle, and five interviews in Minneapolis. Interviews with staff members inside local government further explored their experience working and partnering with innovation labs, the role of innovation labs in the projects, their perceptions of the key determinants in the innovation lab that encourage public sector innovation.
The third group of interviewees was external partners who worked with the innovation lab and the local government on specific innovation projects. Those external partners played an important role in the collaboration to promote public sector innovation. They included research institutes, universities, private companies, non-profit organizations, and community groups. Similar to identifying local government staff, I first identified a list of external partners from the labs’ official websites and news reports. Then, I gained access to research participants through cold-emailing and through the connections of other participants. Interviews with lab staff and local government staff also recommended additional external partners who might provide insights on the collaboration with innovation labs. I conducted five interviews with private companies, research institutes, and non-profit organizations for the Boston MONUM, three interviews with private companies in the Seattle IP, and two interviews with private companies in the Minneapolis OPI. The interviews with those external partners helped to understand the determinants in the innovation lab that influenced the collaboration to influence its innovation capacity.

While the interviewees were identified by snowballing, not by random sampling, the number of interviews per stakeholder group was representative enough of the number of stakeholders in innovation projects of each innovation lab. For the staff in each lab, above half of the staff were interviewed with different job positions and responsibilities in the lab. For government employees, interviews reached multiple government agencies that have been working very often with innovation labs across different policy areas. They were involved in the innovation projects that were prioritized by innovation labs and by the city governments they embedded in. They represented different policy areas that innovation labs have been working on and key stakeholders who innovation labs have been interacting with inside city governments. For
external partners, interviews reached main actors who have been continuously working with innovation labs. Those interviews cover three main types of external actors working with the MONUM (private companies, research institutes, and non-profit organizations), one main type of external actors with the Seattle IP (private companies), and one type of external actors with the Minneapolis OPI (private companies). Table 3.3 represents the number of interviews for each group of actors in three innovation labs.

**Table 3.3 Number of interviews for each innovation lab**

<table>
<thead>
<tr>
<th></th>
<th>Boston MONUM</th>
<th>Minneapolis OPI</th>
<th>Seattle IP</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lab staff</td>
<td>5 (out of 10)</td>
<td>3 (out of 5)</td>
<td>6 (out of 8)</td>
</tr>
<tr>
<td>Government staff</td>
<td>6 (out of 15)</td>
<td>5 (out of 10)</td>
<td>5 (out of 12)</td>
</tr>
<tr>
<td>External partner</td>
<td>5 (out of 10)</td>
<td>2 (out of 2)</td>
<td>3 (out of 7)</td>
</tr>
</tbody>
</table>

An interview protocol was developed to guide the interview process. Using a standardized set of questions in the controlled comparison is recommended to assure acquisition of comparable data from multiple cases (George & Bennett, 2005). In this study, all semi-structured interviews were based on an almost identical interview protocol, which were slightly adapted to reflect the interviewee’s positions and roles in the innovation labs and local government organizations. This allowed me to identify and compare the similarity and difference in the determinants of innovation capacity across the three innovation labs.

The interview questions were developed to evoke the data and information in regard to the key determinants of innovation capacity identified in the literature (Doorewaard, 2010). In qualitative research, interview questions are often raised about both the selected variables and the relationship between the different variables (Yin, 2009). In this regard, the interview questions were framed based on the sub-categories and determinants in the operationalization of innovation capacity. For each sub-category (e.g., human resources), a main question was asked to seek
specific information about this sub-category and to find its relationship with innovation capacity. Follow-up questions in regard to specific determinants under each sub-category were asked to evoke information about this specific determinant (e.g., employees’ attitude and motivation) and how it is relevant to innovation capacity in the innovation lab. Appendix C shows the content of the interview protocol. All interviews were conducted and recorded by the same researcher through online meeting platforms or phones. On average, interviews lasted 60 minutes, ranging from 40 minutes to 90 minutes. The three 40-minute interviews were conducted with two local government staff and one external partner who did short-term projects with innovation labs.

6. Data Analysis

The data collected for this study included both the documents and the interviews described above. I followed the analysis strategy proposed by Miles and Huberman (1994) to identify, analyze, and report patterns across multiple cases. This strategy includes two parts (Bazeley, 2013). First, the researcher treats each case in the study as a stand-alone entity and conducts two or more descriptive case studies using the process known as thick description. The analysis begins by describing and documenting the characteristics of each case before moving into a pattern-making process (Bazeley, 2013, p. 257). Patterns emerge through the examination of those particular cases. Second, the researcher organizes cross-case comparison to identify the presence or absence of and alternatives to these patterns occurring in one or more other cases. It allows for the identification of similarities and differences across the cases and the identification of common patterns (Merriam, 1998). The specific steps for each part are outlined below.

6.1 Within-case analysis

In a within-case analysis, the purpose is to develop in-depth understanding and description of three innovation labs under study. It aims to identify and interpret each lab’s determinants of
innovation capacity before locating general patterns that exist across all innovation labs (Bazeley, 2013). To do so, I followed a deductive method of coding described by Miles and Huberman (1994) to identify and analyze key determinants of innovation capacity in each lab. As described by Miles and Huberman (1994), a deductive method of coding is suitable when the researcher knows what to look for and when the intention is to examine newly collected data with a developed conceptual model. The researcher uses some codes or themes suggested from a theoretical perspective, and the documents provide the means for assessing the relationship between themes (Berg, 2006, p. 6). They suggest a segment of text can be read on different levels and be re-considered, which lead to the identification and explanation of themes and patterns. I followed this coding method to conduct an analysis of both collected documents and semi-structured interviews for each innovation lab.

At the outset of the coding process when considering a segment of text for the first time, it is suggested to reveal the topics being presented in the data in order to present what it is descriptively about (Saldana, 2021, p. 102). During this process, the intent was to re-organize the data to reveal what innovation labs look like in respect to the determinants of innovation capacity. I broke down the texts in the documents and interviews into separate sections according to different points of view. Then, I assigned a code in the code scheme that matched most to each separate section of texts. This helped to describe key aspects of each innovation lab in relation to the determinants of the four dimensions in the analytical framework.

Subsequently, it is suggested to add a more detailed layer of meaning to the data coded descriptively (Saldana, 2021). Coded data were revisited in relation to the broad areas of interest and considered in more detail. This process aimed to interpret the perceived relationship between codes or categories that was shown in the documents and interviews (Berg, 2006). I began the
process with the question: how do the determinants in the four dimensions influence innovation capacity in innovation labs? I read coded data again to interpret whether and how a coded determinant was perceived by interviewees to influence innovation capacity in the lab. Further, I interpreted how important one coded determinant was perceived by interviewees. This aimed to further understand key determinants of innovation capacity in the context of the public sector and during the early stage of innovation process. This further helped to identify the link between those determinants in the lab and how they may be interdependent to influence innovation capacity. A memo was written to the code and the coded quotes to illustrate the perceived relationship and the importance of the determinant.

Finally, it is suggested to consider how themes, concepts, behaviors or processes identified occur within or are relevant across the dataset (Saldana, 2021). It is suggested that similar interpretations were integrated while differences were further examined to develop a coherent and meaningful pattern to show those key determinants. I compared interpretation of key determinants of innovation capacity by three groups of actors to identify similarity, difference, or contradiction. Further, I compared numbers to each code to assess the perceived importance of determinants to influence innovation labs’ innovation capacity among three groups. A note was created when any difference or contradictory among three groups of actors was identified. I further interpreted the coded quotes and identified the reasons behind such differences.

The following Table 3.4 showed examples of the coding process.
### Table 3.4 Examples of coding process in the data analysis (Human resource)

<table>
<thead>
<tr>
<th>Text</th>
<th>Fourth level</th>
<th>Third level</th>
<th>Second level</th>
</tr>
</thead>
<tbody>
<tr>
<td>&quot;I think they're diverse in terms of their staff in terms of experience, in terms of their thinking, in terms of their skills. So I think that's really important.&quot;</td>
<td>1. A heterogeneous academic education</td>
<td>Diversity of employees’ knowledge and skills</td>
<td></td>
</tr>
<tr>
<td>&quot;They're able to draw a really extended, they have a huge pool of talent to select from, and they're able to get really great people.&quot;</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&quot;I guess another piece is being excited by new things and not being afraid to take risks and try new things.&quot;</td>
<td>1. enterprising and willing to take risks</td>
<td></td>
<td></td>
</tr>
<tr>
<td>&quot;The people working directly in the lab are always very interested in new ideas. That's what brings them there. So I think they're the ones driving the exploration of new ideas.&quot;</td>
<td></td>
<td>2. enjoy new idea generation</td>
<td></td>
</tr>
<tr>
<td>&quot;I like people imagine things being different and have demonstrated that they could imagine that bring other people on board and make it happen.&quot;</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&quot;I think that they do get a lot of talented people who are interested in working there who are sort of interested in both working for government and sort of pushing the levers of how government might sort of function better or try new things or do things differently.&quot;</td>
<td></td>
<td>3. enjoy solving challenging and complex problems</td>
<td></td>
</tr>
<tr>
<td>&quot;I really like to get people who have been into systems change, and who've been able to look at something from a different perspective from events, other people to look at it from a different perspective and get them to get in a room and get down to business and some work about how things could be possible in another way&quot;</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&quot;And so I attended the Humphrey school of public affairs at the university of Minnesota to get my master of public policy degree.&quot;</td>
<td>1. high education levels and specialized training</td>
<td>Employees’ attitude and motivation</td>
<td></td>
</tr>
<tr>
<td>&quot;In terms of background and education, I went to the University of Puget sound and to come to Washington and have an English degree. And then I also did a project management certificate program at the University of Washington a few years ago.&quot;</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&quot;I've been with the city of Seattle for 20 years. Actually celebrated my work anniversary yesterday. I'm a senior data engineer within the information technology department.&quot;</td>
<td>2. highly skilled with professional experience</td>
<td>Employees’ level of knowledge and skills</td>
<td></td>
</tr>
<tr>
<td>&quot;I worked at the Seattle foundation for a few years and operations capacity. So similarly, it was kind of like a project management role, but specifically the grant-making and then found myself in city government and the last year and a half. So that's kind of my background.&quot;</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&quot;so we were trained to run randomized control trials and then be able to test that on services and programs within the city.&quot;</td>
<td>4. participation in training related to innovation</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

After the deductive coding process, a narrative summary was written to depict the essence of each innovation lab (Yin, 2009). For each innovation lab, I wrote narrative summaries for the
determinants of four dimensions and how they were perceived to influence innovation capacity in the lab. Those summaries were further developed into case findings, which would be reported in the subsequent chapter four to six.

6.2 Cross-case comparison

After within-case analysis for each innovation lab, a cross-case comparison was followed. Cross-case comparison aims to identify presence or absence of and alternatives to these patterns occurring in one or more other cases (Miles & Huberman, 1994). It shows similarities and differences across two or more cases so that the researcher can assess whether and how a pattern commonly exists in different contexts (Bazeley, 2013). According to Miles and Huberman (1994), the researcher subjects the themes across all of the cases to variable-oriented analysis. First, standard variables across the cases and within the themes are identified. Each case is then written up and presented in a matrix, in as much detail as possible, with reference to these standard variables. Finally, a meta-matrix is created through synthesis or “stacking” of the variables across all of the cases. In this way the researcher retains both the detail of the individual cases and partial but overall explanation of a number of cases. I followed this procedure to conduct cross-case comparison among three each innovation labs.

I created a matrix table with dimensions and sub-categories of innovation capacity in the analytical framework. The four dimensions and sub-categories in the framework (i.e., Resources, Management, Collaboration, and Knowledge) were treated as standard variables to interpret innovation capacity in innovation labs. All coded determinants from each innovation lab relevant to the analytical framework were included in one matrix table. I then utilized the narrative summaries and the matrix table to make comparison searching for common patterns existing across three innovation labs and/or contrasting variations.
The comparison looked across the descriptions to find what was unique and what was common across the data. It was useful to assess whether a pattern predicted by theories could commonly exist across different cases and to add generalizability of this pattern (Bazeley, 2013). I specifically compared the innovation labs in the following aspects: the presence of determinants, the perceived relationship with innovation capacity, and the importance of determinants.

First, the cross-case comparison began with the comparison of the presence of determinants in three innovation labs. It aimed to show whether the same determinants of innovation capacity were presented in all three cases. According to Merriam (1998), the repeatedly appeared themes or categories are considered to be more generalizable elements. In this regard, the determinants that were commonly shared among three innovation labs were identified to construct the core elements of the pattern to interpret the labs’ innovation capacity. The different determinants were also reported and were interpreted in relation to the political and social contexts of innovation labs.

Second, the cross-case comparison analyzed how the determinants were perceived to influence innovation capacity in three innovation labs. It aimed to show whether the determinants of innovation capacity influence innovation capacity through the same mechanism. According to George & Bennett (2005), there could be alternative causal paths to the similar outcome which may or may not have one or more variables in common. In this sense, the commonly shared relationship between determinants and innovation capacity among three innovation labs were identified to form the links between the elements of the pattern to interpret innovation capacity. The differences in the relationship were also identified and were further explored the reasons behind them.
Third, the cross-comparison analyzed the importance of determinants of innovation capacity in three innovation labs. It aimed to show whether the same determinants of innovation capacity had the same weight of influence across three cases. The commonly perceived important determinants and their relationship with innovation capacity were identified to become the core elements of the pattern to interpret innovation capacity. The difference in the importance of determinants were interpreted in relation to the political and social contexts of innovation labs.

After cross-case comparison, a pattern of determinants of innovation capacity was developed that could be generalizable to three innovation labs. This pattern of determinants was further compared with the analytical framework to see if the pattern predicted by the framework was matched against the pattern seen in the cases (Kaarbo & Beasley, 1999). This allowed me to examine to what extent the analytical framework developed based on organizational capacity fits innovation labs’ situation and whether the framework needs modification to understand innovation capacity in government organizations. I reported cross-case comparison in chapter seven.

7. Research Validity and Limitation

Despite taking the efforts to improve the validity of the research, there are several limitations associated with qualitative methods of data collection and analysis present in this study.

First, I acknowledge that qualitative research confronts from confirmability problem because of the possibility of bias in the researcher's interpretation of data. It is possible that the findings of the data reflect my opinion instead of a systematic deduction from the data. Transparency in data collection and analysis is one way to mitigate the problem. Thus, I have shared a detailed explanation of who and how I interviewed. Further, I rely on the conceptual
framework to guide data analysis and interpretation to assist in the inquiry. I include specific information from the interviews and documents to support my analysis.

Second, the credibility of the qualitative research depends on accurately capturing participants’ perspective. Although I have tried to capture the participants’ views as closely as possible, it is possible that I may have missed some point made by the interviewees. Also, in qualitative interviews, the participants can give the information they think is correct or I want to hear instead of the reality. The participants may provide information in social desirability response bias to only show the sunny side of innovation labs. To make sure participants trust me to give credible information, I informed them about the research and assured confidentiality.

Third, the transferability of the qualitative research findings is influenced by case selection. In qualitative research, the small sample size reduces the scope of transferability. The three cases selected in this study are located in a medium to large city with a mayor-council form of government led by a Democratic mayor. Such a political and social environment may influence the availability of external resources for public sector innovation and the top-level support to sponsor innovation labs for increasing innovation capacity. Further, all three innovation labs focus on the early stage of innovation process, which is to initiate innovation projects and generate new ideas. The findings of this study can be generalized to innovation labs in the context mentioned above. For government organizations whose responsibility is to implement innovation in a small to medium city with a different form of government, determinants may be different since they may not have sufficient external resources for innovation or may have to win the top-level support from leaders for innovation.

Finally, while all three innovation labs are embedded in the similar political and social environment, they still have the difference in the experiences of those innovation labs. The
difference in the experiences does raise concerns for cross-case comparison. Because they may
in the different stages, what determinants are key to innovation capacity may be different to them.
For instance, innovation labs with a longer history may become more sophisticated in recruiting
and training staff to acquire new expertise to increase innovation capacity, while those with a
shorter history may not have develop a training program. For those with more experiences,
innovation labs have built sustainable collaborative partnership to increase innovation capacity
while those with fewer experiences may not have sufficient evidence to show the effects of
collaboration. Therefore, those labs with a low level of activity may not provide enough evidence
for determinants of innovation capacity. This may limit the generalizability of the effects of
determinants on innovation capacity in innovation labs. I acknowledge the difference in the
experiences when comparing the differences among three innovation labs and discuss how the
difference in the experiences may influence the effects of specific determinants when necessary.
CHAPTER FOUR

THE MAYOR’S OFFICE OF NEW URBAN MECHANICS (MONUM) IN BOSTON

The Mayor’s Office of New Urban Mechanics (MONUM) in Boston was formed in 2010 as the mayor’s civic research and design team (one of the first in the nation). The office works across departments and communities to explore, experiment, and evaluate new approaches to government and civic life. It aims to explore and tackle experiments and prototypes that cover a range of topics. This includes everything from the future of mobility to City infrastructure to collective well-being. It has a mixed source of funding, which includes City funding and philanthropic funding. The philanthropic funding comes from those foundations including Bloomberg Philanthropies, Knight Foundation, and MacArthur Foundation, among others. Currently, the office has a team of ten members with two co-chairs leading the office.

Focusing on a wide range of policy areas, the MONUM managed to propose, design, and test over 50 new ideas and innovative solutions over the past decade, including everything from the future of mobility, smart streets, city infrastructure, education savings, playful public space, to digital transparency in a smart city. Some of those innovation projects have been further implemented by the other city agencies to create new public services or policies. Examples of implemented innovation include Smart Parking Meter, Boston 311, Additional Dwelling Unit, Compact Living Unit, Boston Saves, Public Realm Digital Transparency Iconography, and among others.

According to interviews, the MONUM is regarded as a unit with a high level of innovation capacity to support the city government conduct innovation activities and developing innovative solutions to public or social problems. Interviewees mentioned that MONUM has become a

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4 For the full list of innovation project in the MONUM, please visit: https://www.boston.gov/departments/new-urban-mechanics#all-projects
place they come to find help when they need new ideas to solve issues they encountered in public services or policies. It managed to absorb risks and uncertainty in the innovation process to enable more new ideas to emerge and to be tested for further improvement and implementation. One MONUM staff said, “we are the capacity and we’ve tried to position ourselves as an extra hand in supporting innovation in other departments. Because city hall is a very busy place and there's never a shortage of things to do. There’s a lot of stuff that they’re trying to struggle through, and innovation would just be adding new work to the queue. So, we show up as the capacity to support departments to do all those innovative things” (MONUM staff, June 3, 2021).

1. Determinants of innovation capacity in the MONUM

Interviews and documents highlighted key determinants of innovation capacity in the MONUM in the four dimensions: resources, management, collaboration, and knowledge. In the MONUM, a team of staff with diverse backgrounds and a high level of expertise for innovation, diverse sources of dedicated funding, an idea generation process and innovative vision and culture, and a broad and strong collaborative relationship with actors inside and outside the city government, as well as effectively managed knowledge within the lab were found critical to building its innovation capacity. However, the use of information technology did not seem to be the key determinant. The rest of the section further elaborated on each determinant with quotes from interviewees and examples of innovation projects.

1.1 Resources

Human resources. Interviews with the MONUM and city agency staff showed that dedicated human resources for innovation were key to determining innovation capacity in the MONUM. Ten out of 16 interviewees mentioned that staff in the MONUM did not have to
conducted day-to-day tasks associated with routine public service programs like other city agencies do. This granted them the freedom from routines so that it was able to pursue creative ideas different from current practices. They were motivated about solving public or social problems with innovative ideas, which drove them to challenge the status quo of public management. According to interviews, the dedicated staff increased innovation capacity in the lab by focusing their time to find new resources, methods, or knowledge that were not thought about before to drive new ideas or solutions, which ultimately build innovation capacity in the MONUM.

“There are two full-time staff that have the freedom and their job descriptions to explore new ideas and/or run projects from start to finish, whereas all our other staff have specific programs or things that they run. So, other staff doesn’t have the capacity to start new things. So, I think those are really key components of what makes somebody good at this work. Those dedicated, passionate members are the most important assets the MONUM have to explore new ideas. They are actually innovation capacity. People are the most important in the MONUM to do those projects we cannot think about. They have time to talk to different people, to look at new things outside Boston, go visit other cases, whereas we don’t have that luxury” (City agency staff, July 23, 2021).

Second, interviews further showed that a diverse and high level of education and professional backgrounds in the MONUM was also key to increase innovation capacity. It helped to build innovation capacity by increasing project management and increasing knowledge acquisition for innovation. The collected information in the following Figures 5.1-5.3 showed that most of the staff members in the MONUM have a graduate degree, and they have had professional experience in diverse fields. This indicated that the MONUM staff have developed particularly
strong skills relevant to innovation design and project management through their previous professional experiences or self-training activities.

According to interviews, the staff’s different perspectives and angles helped to increase innovation capacity by acquiring new knowledge in the multiple domains for innovation. Interviewees mentioned that the lab staff’s background outside the public sector brought additional angles and knowledge to understand public problems. They provided new knowledge to broaden the mindset and knowledge in the lab by bringing in alternative practices based on their own professional practices. In this sense, it increased knowledge acquisition in the lab to inform new changes and ideas for innovation in the city government. One MONUM staff said, “I
think one is an interdisciplinary team. There is a team that has a background in industrial design, but it also has an expert who has a more technology background and knows a bunch of different coding languages, too. They bring in and gather different expertise and skills that are important to develop those innovation projects, because no solution relies on a single type of skills. What I found most amazing in this team is how we bring in our own knowledge, experiences, skills to the team. For example, I can bring in the expertise in design thinking, while another one could add data skills to it. I worked in the non-profit before so I can say something about how we can work with non-profits to solve the problem. We bring those different things inside the team so that we have more information to innovate” (September 9, 2021).

In addition, interviewees mentioned that a high level of project management skills was critical for the MONUM staff. Such project management skills enabled the lab to navigate through the non-linear innovation process and to deal with unexpected challenges. They managed to organize innovation projects into tangible deliverables, to integrate insights from multiple stakeholders, and to track the project progress step by step for achieving final innovative solutions. One city agency staff said, “I think they are extremely organized and great project managers, which are what makes them good at this work. The biggest challenge to manage housing innovation is that it is often complex and iterative in process, involving many people. You really need to manage well those different interests, a long process with rounds and rounds of conversation, and aspects you may not foresee that can pro-long the process. And MONUM is creative in what this process looks like and manages different components well to really have a new idea with impacts” (July 23, 2021).

Third, all five interviewees at the MONUM mentioned that hiring extra interns through summer and yearlong fellowships was a key determinant of innovation capacity in the MONUM
by increasing the number of staff focusing on innovation. Those interns allowed the MONUM to support more policy areas that need innovative solutions. At the same time, they added extra new knowledge and skills that sparked new thoughts and ideas to be further explored and that addressed unexpected issues in the non-linear innovation process. In this regard, the MONUM managed to build its innovation capacity by adding extra human resources oriented toward innovation.

“I think one big thing is that they have annual fellows and because of their reputation, they’re able to draw a really extended, they have a huge pool of talent to select from, and they’re able to get really great people. They come from an academic background, the others have really relevant and interesting practical experience in their work or their lived experience, but they’re able to select every year, a group of people that come in and work on projects who are smart, thoughtful, bring a really interesting perspective to innovation work” (City agency staff, September 16, 2021).

In spite of a dedicated team of staff with diverse expertise and knowledge, the size of the team did not seem enough to meet the increasing demands of public sector innovation. All five interviewees in the MONUM and four interviews from city agencies mentioned that lab staff have their own limits on the number of innovation projects they can work on simultaneously. After initial exploration of new ideas, the MONUM does not seem to have the capacity to follow up with the innovation projects long enough to see them being fully implemented. It seemed that the size of the team in the MONUM was another key determinant of innovation capacity. The challenge to expanding the lab was mentioned in the following quote from one MONUM staff.
“So hiring is hard for us because we don’t have direct control of our budgets. So, the challenge of not being a vertically oriented department means that we don’t have a specialized budget. As a result, it is harder to staff up or hire people. The other small thing that I would say is that we still have to go through some of like the HR bureaucracy. We bend those rules as much as we can in ways that we think are positive for the team as well as for equity. But sometimes we were tied up in that” (MONUM staff, June 3, 2021).

Financial resources. The interviews and collected information first showed that a variety of sources of funding dedicated to innovation was an important determinant of innovation capacity in the MONUM. The multiple sources of funding increase innovation capacity by adding the lab’s flexibility to use funding for exploring new ideas. As is shown in Figure 4.4, over 60 percent of the funding that the MONUM has received in the past came from private sector actors and philanthropies. According to interviews, the external funding was more flexible to use compared to the budget in other government departments. This allowed the MONUM to use the fund to conduct an innovation project more quickly without waiting a long time for budget approval so that the lab can initiate more new ideas. One MONUM staff said, “we can use it to buy a couple things here or there, we can use it to fund a project that we don’t have to wait a year to get something into the budget cycle, which is the way the team works. We need to be able to rapidly implement and deploy something in a matter of months. The external funding sponsors the projects that are not usual areas for innovation in the government. They are really long-term partnership with the MONUM” (MONUM staff, July 7, 2021).

For example, TD Bank and The Trustees provided over $300,000 since 2018 to explore new ideas to reimagine public spaces in Boston for environmental protection, community engagement,
and equitable public health outcomes. This funding enabled the MONUM, along with the City of Boston’s Public Works Department, to develop innovation projects such as portable reading rooms, community gardens, city green space with original artworks, and customized compost bins for reducing contamination. Through their partnership, 14 projects at six community gardens in Dorchester, Roxbury, Fenway, Jamaica Plain, and East Boston have been launched. Selected projects have supported food access, storytelling, community dinners, performances, and interactive play. “The TD Bank was an amazing partner in the public space re-inventing events. Because the grant it provided, we were able to organize the competition and attract designers with great talents. With this money, we can organize contests, we can try those great ideas in different locations. This might be challenging with Public Work budget because the purpose of each funding was pre-determined. You need this extra money to try new things that were not thought about at the beginning of the year” (MONUM staff, July 7, 2021).

![Figure 4.4 Percentage of funding from different sources](image)

Second, interviews with the MONUM staff showed that the small amount of grant for each innovation project also provided more flexibility to use it than a large amount of funding. In the initial stages of the innovation cycle, the availability of small grants allowed MONUM staff to...
examine innovative ideas that could have serious policy implications if it goes wrong. One of the MONUM staff said, “the value of small chunks of money, in the $10,000 range, can often kickstart some really interesting work. Having a big budget for us has not worked. We can’t spend the money fast enough. And just having flexible and smaller trumps of money has worked really well for us. And by working in that grey, I think you do actually get a lot done. To me, people who have time and energy to think and explore is more critical than money to spend. Sometimes, you only need our MONUM staff to dig into issues you have and to find what we might do to improve them. You don’t really need a lot of money to come up new ideas to test. So doing the big thing is hard to do. So doing the smallest thing that chips away at the big thing over time, I think has proven most successful” (June 3, 2021). The innovation lab intentionally tried to be nimble and small in the amount of funding so that they can try innovative ideas that are very different from existing practices and are not yet tested.

In spite of the usefulness of small and flexible funding in the MONUM to initiate innovation projects, those projects still needed a larger amount of stable financial resources so that it could be implemented or institutionalized on a wider scale in the rest of government. Three interviewees in the city agencies and two external partners mentioned that the lack of sufficient funding for just one iteration may neither be enough to prove the concept nor to allow other city agencies for large-scale implementation. For those innovation outputs being implemented, the MONUM’s initial new ideas led to another round of financial investment from city agencies responsible for implementing those new public services or policies. Such a stable flow of funding would allow the MONUM to transit mere ideas to concrete implementable solutions. The MONUM further helped government agencies in making transition plans, walking through changes, and figuring out how to further fund extra staff, equipment, or methods of service
delivery. “I think other important factors would be to some extent funding because there’s always a point at which an idea would transition from a recommendation to something that’s actually funded. So that can be important in deciding what ideas are pursued further. It influences decision-making about which projects to pursue and what scale to pursue them because they have to be very targeted and strategic about piloting something”, said one city agency staff (September 9, 2021).

**Information technology.** Interviews with the MONUM and city agency staff mentioned that information technology did not seem to be an important determinant of innovation capacity in the MONUM. The lab conducted a variety of innovation projects on different policy topics, such as housing, public space, education, or environmental protection. Most of them did not involve information technologies at all. The lightweight of information technology in the MONUM was explained by its principle that innovation is not always the shining and futuristic technological artifacts, but appropriate solutions to public problems that eventually generate public value. It was demonstrated in one of the blogs about housing.

“While technology surely has a place in innovative housing, a limited definition of this type leaves many marginalized publics unaddressed and does not necessarily forward an affordability agenda. The ideas generated through the Housing Innovation Competition, however, demonstrate the kind of relevant innovation necessary for affordability’s sake; Building spaces, which meet community needs and desires, in untraditional ways and use nonconventional tools” (New Urban Mechanics, 2017b).

According to interviews, the use of data was perceived as key to innovation capacity in the MONUM by providing a better understanding of public or social problems and the potential
impacts of proposed new ideas. Regardless of the IT for data analysis, the results from data allowed the MONUM to better decide how to utilize resources or skills to further explore or improve those new ideas and initial designs. For instance, the MONUM focused on collecting data to allow for better decisions on the city streets with community members. The innovation lab was laying the foundation for a future public realm that is devoid of parking signs and meters that clutter the sidewalks (MONUM, “A year in reflection 2020”, 2021). Another example was the smart parking system, which was used to collect data for better planning decisions and providing real-time on-street parking availability information to drivers through an app. “By collecting real-time data and providing actionable analytics, our hope is that we can help our customer take the first steps towards being a truly smart city” (City Implementing Parking Changes, 2017).

While the COVID-19 pandemic seemed to give rise to the use of ICTs for more connection and coordination with partners within and outside the city government, such use of IT for coordination did not seem to build innovation capacity in the MONUM. Interviews with the MONUM staff showed that the use of such IT enabled the MONUM to collect feedback and information more efficiently for initial ideas and designs of innovative solutions, yet those ideas and inputs were sometimes “different”, “radical”, or “difficult to understand”. The efficiency in collecting feedbacks does not automatically translated into creativity since those ideas needed to be further discussed and elaborated on to assess the feasibility and realization of those ideas. The use of IT did not facilitate such a level of discussion as the in-person interaction did, because it lacked partners’ physical interaction with designs of new solutions.

“I still missed in-person meetings where people can share their ideas openly and freely. We can show people those new designs of housing models. They can
experience those models by themselves, which you cannot do online. The conversation is more casual, and they often expressed some things that we did not expect. They felt more confident to talk about their own experiences than via screen and helped me to understand the logic and reasons behind their inputs. Although IT could help us to reach more people, to gather more inputs or feedbacks, but that did not reflect the real feelings from the real person. It did not really get to interact with them to find those wow moment of truth for our projects”

(City agency staff, September 9, 2021).

1.2 Management

Leadership. Eleven out of 16 interviews mentioned that leaders who are committed to public sector innovation are a critical determinant of innovation capacity in the MONUM. According to interviews, the MONUM’s leaders helped to build innovation capacity in three ways: by protecting and empowering employees, by setting strategies for the MONUM, and by connecting with partners for additional resources.

Both leaders played a key role as policy entrepreneurs to bring in new ideas or new possibilities ahead of other public employees. It helped increase innovation capacity by adding new knowledge and ideas to the lab for generating innovative solutions. This was demonstrated in several interviews and news reports that they brought in new opportunities as a starting point for public sector innovation. “I would say it is key that you have somebody like [one director of the MONUM] who are looking to understand the new technologies appropriately. He opened the conversation between the city government and us to look for new solutions with those technologies. If not him, I don’t think the government would initiate such a project or even open its mind to think about it. What he did was crucial to bring such new opportunities in the
autonomous vehicles to the government attention and to start think about how that might change the public transportation”, said one external partner (November 9, 2021).

First, the leaders played a key role in offering protection for their staff from being criticized for taking risks or failure. This helped to enhance human resources’ motivation for innovation. Being protected, the lab staff felt safe to explore new ideas with certain risks and to challenge current routines of government practices to seek alternative solutions. The leaders enabled the staff to utilize their expertise and knowledge for exploring new ideas that have not been tried before. In the example of the chatbot for food access, the leaders’ protection provided the staff with confidence and encouragement to pursue a new tool that pushes notifications of food resources to local residents. Interviewees mentioned that the MONUM staff were open to sharing new bold ideas with their leaders and trusted their leaders to help with those challenging questions and took initiatives to explore new versions of chatbot. This gave rise to the initiation of the project and enabled the piloting of this chatbot.

“I think having that partner and having somebody that I knew I could trust [is important]. If nobody responded to me, the chatbot would have been a certain risk to the department. Let's scrap it. And thank you so much for trying out. But because she [MONUM staff] is open, if I would come up with a new chatbot version, she would be happy to talk about it. The MONUM was to manage failure and get over it. This is the kind of attitude I need when I think about new things but not sure if that would work. So, I think that made starting new things even easier given that we were both open to taking a couple of risks” (City agency staff, September 22, 2021).
Second, the leaders actively developed innovation strategy and articulated the importance of innovation across the city government. This thus helped to build innovation capacity by actively promoting the MONUM’s legitimacy to use resources for innovation. Interviewees mentioned that the leaders of the MONUM often expressed themselves to other city leaders as an internal consultancy to help solve their problems. This allowed the MONUM to convene the leaders from multiple agencies to discuss the idea and to win their support for new idea exploration. One MONUM staff explained, “people are policy. It really depends on leading. When department heads come together to try different ways of thinking and to offer some support, it brings new opportunities where a lot of the folks try to think about how we can synchronize around the work that we're all doing. We made ourselves to be an extra hand for them to find and solve the problems. We made our team to be an added value to them. Let them know we are not breaking things but building new possibilities with them. [One leader of the MONUM] was really skilled at storytelling and making videos to convey such ideas from MONUM to others. He created such an ethos where people can truly be themselves, talking about innovation work and making sure that it is still traveling along. This really wins their agreement on the innovation work we are doing” (MONUM staff, July 7, 2021).

Finally, the leaders also actively connected with people inside and outside the city government to find the support of resources and knowledge that further increased innovation capacity in the lab. Leaders became liaisons among external and internal actors to bring new or additional resources, knowledge, or expertise to MONUM. It helped to increase its own resources and knowledge of innovation can be upgraded to build innovation capacity. One city agency said, “[innovation] requires some very specific skills that often are not present inside city departments. And it requires a really thoughtful and careful approach to building allies and
managing risks that I think MONUM is uniquely suited to do. They have very collaborative leaders and staff. That helped to bring those ideas, supports, thoughts, emotions, skills around the MONUM so that it has those specific skills they need to be creative” (City agency staff, September 16, 2021).

**Vision and strategy.** Interviews with the MONUM and city agency staff first showed that a vision toward public sector innovation and a flexible innovation strategy was one key determinant of innovation capacity in the MONUM. According to the mission statement, the MONUM “works across departments and communities to explore, experiment, and evaluate new approaches to government and civic life. We explore and tackle experiments and prototypes that cover a range of topics. This includes everything from the future of mobility to City infrastructure to collective well-being.” This vision toward innovation increased the lab staff’s motivation toward innovation and focused their time on discovering and initiating new ideas for innovative solutions. This also drove the development of procedures and culture in the MONUM to better utilize resources for idea exploration, which would be further demonstrated in the sections below.

Further, the MONUM had a flexible innovation strategy that explored different methods or tools for innovative solutions. Interviews with the MONUM staff and external partners showed that the lab did not limit itself to one particular way to develop innovation. This granted its flexibility to utilize new innovation tools or methods that were not common in the city government. Such new methods or tools brought new perspectives to explore public problems and helped to increase new knowledge for generating new ideas. It enabled the MONUM to meet the changing demand for different types of innovation in the public sector and answer public problems that often require more than one single innovation method.
“I think of a lot of approaches that other innovations teams have taken is they're just overly rigid. They work at these very narrow things in a world that is big. A few years ago, it was all about performance management, and then it was all about open data. Then it was all about design thinking. None of those things are bad, but when we specialize in those things, you limit yourself and you can't really be responsive to a changing world. So, I think that we tend to be on the side of flexibility. We try to keep our ability to move in different directions and to adapt. This helped us to meet the different things that need innovation and did not ignore other things if we were to focus on only one of them. We don’t stick to one tool or method, imagining it is the one to solve everything. But try to get the target from another angle. This definitely enriched our skills to be responsive to different questions” (MONUM staff, June 3, 2021).

Second, according to interviews, the MONUM’s aligning its innovation strategy with city government goals played an important role to build its innovation capacity. As stated in the previous section about leadership, it enabled the MONUM to build innovation capacity by creating a network of city agencies and acquiring their ongoing support of resources for innovation development in the long term. For example, in alignment with the CIO’s office, the MONUM has been funded $10,000 for each technology pilot ($50,000 in total) that supported the development of the smart city in Boston. One MONUM staff said, “I think we don’t want to be in a position of trying to push new ideas on other people unnecessarily. We show up and we are always thinking about how we can help the departments think about or do these new ideas that they don't have time to do. We always look for opportunities in their context, talking to what they are stating. We showed them how we might be a pair of extra hand to them to help them do
what they may not have skills to accomplish. Innovation is not just moving fast and breaking things, just in our own life bubble. We need to be clear about what new things to be created at the first place and how that new things could go back to the departments” (MONUM staff, June 3, 2021).

The lab leaders played a key role in keeping the MONUM’s alignment with city government goals, primarily with the mayor’s office. The change in the mayor’s priorities caused damage to the innovation capacity in the MONUM since it may disrupt the continuity of the resources or skills in the MONUM to build innovation capacity for certain innovation projects. The lab leader adapted the MONUM’s priorities over time to the changes in the leadership of the city government. The adaptation helped to continuously build innovation capacity by better aligning the mayor’s strategy to obtain financial resources for innovation. One MONUM staff said, “we have gone through two elections and one change in the mayor. Luckily, we had a rather consistent leadership in the city, but there were some changes here and there. What we did was to keep adaptive to those changes and became the spearhead to those priorities in the new leadership, while keeping our eyes on those projects that were still on-going. Those projects may be hibernating under this mayor, but they could be useful in another mayor’s term” (MONUM staff, June 23, 2021).

**Organizational structure and procedure.** According to interviews, positioning in the mayor’s office and having a permeable structure was key to innovation capacity in the MONUM. First, being in the mayor’s office helped to build innovation capacity by establishing the MONUM’s legitimacy to pursue public sector innovation. Legitimized by a political sponsor, the mayor, the MONUM was not constrained by performance metrics or guidelines that were often followed by specialized city departments. It allowed the lab to have a certain level of autonomy
to utilize resources for innovation projects that often did not have a clear performance metrics to evaluate their return of investment. It also allowed the MONUM to have a global view of the city government so that the lab jumped out of the political or administrative constraints to imagine new ideas. One city agency staff said, “to have a space that is not constrained by political and financial context is really critical to innovation. Every city employee has internalized to the point where it’s often difficult for them to even imagine anything outside of those constraints ever possibly exists. Back by the mayor’s office, MONUM is such a space with a free mindset to find answers to open-ended questions. It engages with blue sky ideation and thinks outside the box to boil it down into some concrete new ideas that can then be implemented” (City agency staff, September 16, 2021).

Second, the MONUM’s permeable structure further facilitated communication across different city agencies to cross-fertilize new ideas. Interviews with city agency staff showed that the MONUM became an information hub where it collected new thoughts or ideas from other government agencies and across various disciplines. Such frequent communication increased innovation capacity by increasing lab’s new knowledge acquisition so that they were able to increase their innovation capacity for new ideas or proposals. For example, in affordable housing innovation, the MONUM managed to involve various departments in the city hall, including the Department of Neighborhood and Development, Inspectional Services Department, Public Works, Library, Fire operations, and among others, to explore housing with public assets. Those city agencies worked together to collect responses to the Request for Information and offered a list of public assets for consideration. With such information, the MONUM managed to re-define the public benefits (and necessary trade-off), consider procurement law constraints, and eventually propose new ideas of adding apartment housing over libraries.
“In this project, so many of these resources have really come into play and have really helped to support the work of the lab. It needs to be done given that housing is often a complex issue in the city that is linked to various city branches. We should thank our connections to both the mayor's office and also to our colleagues in the Department of Neighborhood and Development and also across a number of other departments. Otherwise, there will be a lot of missed opportunities because they're just not communicating clearly or have not found access to some resources others are offering, even if some of those things are being done. They really helped us to collect the new information that led to reconsideration of what is needed to affordable housing” (MONUM staff, July 15, 2021).

In addition to organizational structure, the three-step ideation procedure of exploration, experimentation, and evaluation helped to build innovation capacity in the MONUM by creating a quasi-formalized pipeline of the innovation process to speed up idea generation in the lab. Outside the MONUM, interviewees mentioned that the working procedure focuses more on day-to-day tasks, and finding new solutions is a secondary concern (City agency staff, September 16, 2021). Such a work procedure, focusing on developing and testing new ideas enabled the MONUM to develop innovative ideas or solutions that might take a lot longer to go through in other regular city agencies. Figure 4.5 illustrates this idea generation procedure in the MONUM.
The procedure helped to speed up the ideation by first widening the inputs from various disciplines for potential ideas. Starting with open questions about public or social challenges, it enabled the MONUM to explore key issues in the public policies or services, build a holistic insight into the core causes, and creatively generate new ideas that have not been thought of before. Using multiple techniques for exploration (e.g., challenge/competition, human-center design workshops, field observation, interviews, behavioral insights, and among others), the MONUM managed to widely collect information and knowledge around multifaceted public or social issues. One interviewee said, “I think the pipeline of innovation in the MONUM is the key. Because often, where do you get the idea to do something that's not business as usual? And there's no one answer to that question. So you have to have a wide novelty pipeline or a wide intake to that funnel. When you look at the MONUM, they do a lot of work to take in ideas from startups and city staff. They ask a really basic, but open-ended question and try to find various plausible answers without constraints” (City agency staff, September 16, 2021).
Second, through experimentation, the procedure helped to gauge the impact of these new ideas before scaling up, thus managing the risk of potential failure which often limited innovation outside the MONUM. According to the blog, the MONUM has established itself as a space for risk-taking and where failure is acceptable, with small-scale, low-cost, and short-term pilot projects to test the feasibility, favorability, and potential impact of an idea without overcommitting city resources (Stearns, 2019). In such a way, the MONUM reduced the cost of potential failure and through trial-and-error practices, learnt new insights from those failures to develop more informed proposals and change management for innovation. This was explained by the following quote.

“The MONUM is really optimized for rapid learning from experimentation, and they're optimized for failure. This is not to say that everything they do fails, but in order to learn and innovate, you have to try things that don't work or those things that do. What makes the MONUM distinctive is that they're actually designed so that they can absorb that risk as a learning opportunity through trial and error and let us understand the new change in the process” (MONUM staff, July 7, 2021).

Organizational culture. Interviewees stressed that an organizational culture that is innovation-oriented, risk-taking, and citizen-oriented was another important determinant of innovation capacity in the MONUM. First, eleven out of 16 interviewees had the impression of the MONUM’s organizational culture as creative, imaginative, and open-minded to pushing innovation projects. Under such innovative culture, the lab staff were curious and driven to look into the future for new visions in the city and for new opportunities to initiate innovation projects. They were able to free themselves from political or administrative constraints in the city
government but to imagine new changes through multiple lenses. In such a way, lab staff were enabled to utilize resources for exploring new ideas. It is stated in one of the blogs that “MONUM’s culture of joy, curiosity, and delight ignites my desires to tinker with different modes of understanding and thinking about solutions. My MONUM fellow family has given me the courage to try new things and explore my project from multiple lenses. This type of work environment encourages us to balance the rigors of conscientious public service with a need to discover innovative ways to problem-solve” (New Urban Mechanics, 2019).

Second, a high tolerance toward risk and failure, cultivated by the lab leaders, helped to build innovation capacity. Because of the leaders’ protection and the mindset that failure is acceptable, the lab staff were open and welcome to discuss failure within such space, which is an unusual sentiment in the city government. It increased lab staff’s motivation to explore bold new ideas that could have serious policy implications if failed. Not afraid of being criticized by failure or mistakes, the lab staff were allowed to utilize their time and resources to initiate new ideas with certain risks, which increased lab’s innovation capacity. One external partner said, “I think that there’s most of the city does not feel the freedom to experiment in that way. Most of the people I work with are perpetually afraid of getting critiqued and getting in the newspaper for the wrong thing. And so, in MONUM, at least, for the most part, people do not feel that constraint” (External partner, November 1, 2021). The lab staff was not to blame for failure, and they had the flexibility and courage to explore new things that other government agencies may prevent themselves to try.

The organizational culture in MONUM added innovation capacity by encouraging the lab staff to see even failed projects as a source of innovation. The failures became generative, while not necessarily hitting their intended mark, and provided valuable learnings, future experiments,
or unexpected utility. According to interviews, the lessons learnt enabled the MONUM to reflect upon and improve its own knowledge or skills to increase innovation capacity. The analysis of the failure also allowed the MONUM to better re-allocate resources for a more promising direction so that it managed to utilize resources more effectively to build innovation capacity.

“If it doesn’t go anywhere, I think that that’s okay because we still get to keep the learned lessons of that as well. And if there’s any sort of like negative impacts that we’re tasked with really helping to mend what that impact was. We don’t see a failed experiment as a failure of our team until we cannot learn from it. If we cannot find anything new or different from what we already know, then it is a true failure. Otherwise, I see it is a good chance to improve our team’s skills. We all have that growth mindset” (MONUM staff, July 15, 2021).

Third, the MONUM’s culture of citizen orientation and driven by citizens’ needs to pursue innovation projects also helped to build innovation capacity. While being tolerant toward risks, it does not mean that the MONUM takes unnecessary risks and pursues innovation for innovations’ sake. It does not necessarily have a culture of proactiveness to become the first. The MONUM has a culture of citizen-orientation and been driven by citizens’ needs to pursue innovation projects. In this respect, the MONUM emphasized listening to citizens’ feedback and perspectives on certain innovation projects. It allowed the MONUM to collect extra information and insights from citizens to further increase knowledge for new idea exploration. The blogs and news reports showed that citizens’ inputs drove the MONUM’s staff to reflect upon the use of resources and their own knowledge for public sector innovation to build innovation capacity.

“The initial Housing Innovation Competition and the winning proposal were shaped by the community. Fundamentally, it is necessary to ensure the community
not only has the opportunity to say yay or nay, but also, to have a voice to (1)
direct how proposals should look and the needs they must meet; and (2) identify
which aspects of the proposals best meet those expectations” (New Urban
Mechanics, 2017c).

1.3 Collaboration

**Intra-organizational collaboration.** Interviews with the MONUM and city agency staff showed that collaboration with internal city agencies was key to innovation capacity in the MONUM. Such collaboration helped to build innovation capacity by increasing the lab’s own knowledge and resources for exploring new ideas and new solutions, bringing in subject matter expertise and resources. First, various types of subject matter expertise are regarded as necessary since public sector innovation aims to solve public or social issues that do not fall in a single domain of expertise but require knowledge in different specialized departments in the city government. In this regard, through collaboration with multiple city agencies, the MONUM managed to increase its knowledge and expertise by integrating different aspects of public policy or service issues that were necessary to build a holistic understanding of new ideas or innovative solutions.

It provided opportunities for public employees from different agencies who may not have known each other before to communicate and connect the dots and exchange knowledge or ideas for current city challenges. It, therefore, helped to increase knowledge about government operations so that the MONUM built innovation capacity to generate new ideas or alternative solutions. For example, in Project Oscar⁵, the MONUM collaborated with the Department of Public Works and the Department of Environment to design compost bins that collect food waste

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⁵ Project Oscar is Boston’s 24-hour community compost pilot program. Project Oscar compost bins give communities a place to drop off residential food scraps for composting. [https://www.boston.gov/departments/public-works/project-oscar](https://www.boston.gov/departments/public-works/project-oscar)
at residents’ homes. Collaboration with the two departments enabled the MONUM to learn from professionals about specific rules of food waste and environment protection as well as devices and practices for food waste collection. Combining both policy subject expertise with implementation expertise, the MONUM managed to identify 15 locations to locate compost bins and regulate what can be composted. One MONUM staff said, “The two departments did not talk to each other before. I tried to bring them together on the same page, because the problem needs both parties, the policy knowledge from the environment and practical knowledge from public works. After they talked, they find both of them were targeting the same goal. This further brought two parties together and exchanged ideas to design compost bins” (MONUM staff, August 6, 2021).

Second, in addition to increasing subject matter knowledge, having a connection with those agencies enabled the MONUM to have access to resources (e.g., human, financial, data, etc.) from different departments that are needed to develop new ideas or solutions. For human resources, city agency staff who are interested in innovation work were gathered to build a collective innovative mind that creatively explore new ideas. For non-human resources other than financial resources, often included data resources and physical locations for piloting. For example, the MONUM collaborated with the Department of Transportation which supported the MONUM with multiple sites in the city streets to test smart city infrastructure (e.g., performance parking pilot, street bump, pick-up and drop-off pilot for passenger cars, among others). It also worked with Analytical Team to collect sensor data in the pickup and drop-off zones to evaluate the productivity of curb usage and the effects on parking incidents. Such collaboration was perceived as important to a small team like the MONUM with limited human and financial
resources that may not have all the necessary skills to support various stages of public sector innovation.

“I would also say what MONUM does really well is this interdepartmental collaboration. So sometimes we’re just a convener. When the housing innovation lab tried to figure out where we could build more housing on city properties, we turn to the transportation department, which owns parking lots for buildings, and then had the parking lot underneath. Before all the transportation department does is parking and cars and bikes, but housing is not their thing. This is the land for transportation. Well, MONUM brought in the housing department. And they said the neighborhood has very little permanent space for affordable housing. And there are a few city-owned parcels where we could build that housing and one of those parcels is a transportation department-owned lot” (MONUM staff, July 7, 2021).

With a permeable structure and leaders networking with internal agencies, being in the mayor’s office enabled MONUM to easily connect with other city agencies. City agencies would like to further align with those projects and priorities from the mayor’s office, winning support and attention from the mayor, which helped MONUM to connect with and win support from other city agencies in conducting innovation projects.

Collaboration with external partners. According to interviews, collaboration with actors outside the city government, like intra-organizational collaboration, was another major determinant of innovation capacity in the MONUM. Since the MONUM is a relatively small unit in the city government, it needed extra skills and expertise outside the unit to further enhance its resources for the exploration of new ideas and the development of public sector innovation. One
of the MONUM staff said, “So I think that the more innovators can be out there the better so that we can be working directly with them as well in different capacities, in different ways, and building our capacity that way as well. I think that when we’re talking about a smaller team it is always helpful to have a larger network and also sort of a larger team to work with internally and externally” (MONUM staff, July 15, 2021). Such collaboration helped to build innovation capacity by increasing new knowledge and resources from private and non-profit sectors to increase the lab’s own ability for exploring new ideas and new solutions. Interviews with the MONUM staff showed that collaboration with research and non-profit organizations helped to build innovation capacity by bringing in new knowledge from academic research or experiences in other sectors or regions, and meanwhile involving citizens helped by sharing their lived experiences with the MONUM to identify new changes needed in the city government.

First, according to the collected documents, the MONUM collaborated more with organizations or institutions in the research/academia community and the non-profit sector, but less with the private sector (e.g., startups) (A full list of external partners is shown in Appendix D2). Because of the large number of universities and research institutes in Boston, the MONUM can easily find external partners who are interested in the development of public sector innovation (MONUM staff, June 3, 2021). As shown in section 1.1, collaborating with non-profits and philanthropies enabled the MONUM to have more flexible funding for innovation than the rest of the city government. Further, additional academic knowledge from research institutes helped the MONUM to discover the blind spots that may be neglected by public employees’ bias, which enriched the pool of potential ideas for public sector innovation.

For example, in building public data principles, the MONUM worked with Harvard Cyberlaw Clinic to learn from the experiences of other cities and discovered core principles for
successful and equitable open data initiatives. Those principles were further formulated to complement Boston’s values and enacted policies, such as Resilient Boston and Boston’s Open Data Policy. It helped to discover inappropriate rules or practices in open data initiatives, such as identification information and sensitive data, which improved digital transparency in the public realm. In another example of housing innovation, the lab is asking industry leaders, and members of the architecture community, including MIT and the MIT Media Lab, for their input to find new insights into housing policy, design, size, and cost (Hughes, 2015). Some of those inputs were later formulated by the MONUM with the Department of Neighborhood and Development into specific housing innovation projects (e.g., Intergenerational Home-share, Additional Dwelling Units, Future Deckers, among others), while others were saved for future needs.

Second, interviews with the MONUM and city agency staff showed that citizen involvement enriched the pool of potential ideas for public sector innovation. Citizens’ living experiences provided an alternative perspective for lab staff to understand core issues in public problems. Their feedback and inputs helped to re-order the priority of knowledge about those public problems and helped to cover possible blind spots or bias from city staff. In this sense, involving citizens allowed the lab staff to discover new knowledge about where public services or policies needed new changes. Such new knowledge further increased lab’s innovation capacity and allowed it to generate more new proposals.

In the example of housing innovation, involving citizens was the key to identifying new ideas with the potential to make a real impact on affordability in Boston. The MONUM organized community meetings, charrettes, and pop-up engagement efforts, among a number of other approaches, and tried to build community perspective into the team’s prototypes of housing with public assets. As one interviewee said, “we were having different events where you’re out there
interacting with the public. I think those community relationships are really important because we can’t just think about all these ideas ourselves. They need to come from somewhere that actually matters. Addressing the housing problem from the ground up entails engaging people who have been through or currently endure similar traumas as the target audience. We can’t just pretend to grasp the extent of the issue if we haven’t suffered it ourselves. Citizens’ own experiences are important to let us know where to improve and what is wrong. Their inputs made me realize our perception on their housing needs is too simple to capture all the difference” (City agency staff, July 23, 2021). Another MONUM staff also mentioned that “with the compact living, we were able to test with a model unit where we put a small unit out to the public and they were able to walk into it and experience that. So that was a test of public opinion. Do they think this is something worthwhile for the city to take on and to change our rules based on public opinions? And then we changed the policy as a result of strong public opinion” (MONUM staff, July 15, 2021).

In the citizen involvement, it was important for the MONUM to engage with a diverse range of populations and to treat all citizens equally, especially historically marginalized community groups. This helped to build innovation capacity by better understanding the potential impacts of new ideas on all stakeholders affected, in addition to the end-users. To create innovative solutions to public or social problems, interviews with city agency staff mentioned that it was important to weigh insights from different groups of citizens so that new solutions would create public benefit rather than favor one group over another. Given population diversity in terms of race, ethnicity, and culture, the MONUM needed to identify the different needs of various groups of Boston residents so that it can initiate innovation projects providing public benefits for all community members. One interviewee mentioned that “across the City, and in every
neighborhood, we must work closely with residents to determine what each Housing with Public Assets project looks like. We should think of Housing with Public Assets as a series of projects in a portfolio, each with neighborhood-specific goals and benefits. We believe the trade-offs that they highlighted, and the intended benefit should be clearly defined with the community in a site-specific way” (MONUM staff, July 15, 2021).

Within the MONUM’s collaboration, the interviews showed mutual trust and understanding were key to ensuring that such collaboration helped to build innovation capacity. It helped to build innovation capacity by facilitating open interaction with partners to share their expertise, knowledge, and resources. It opened channels to exchange key information and knowledge as well as to openly explored the cause of failure in experiments so that the MONUM was able to learn new lesson to increase knowledge for new changes to be made to improve innovative solutions. One MONUM staff said, “I think getting back to the relational nature of this innovation work, investing in building and maintaining those relationships is necessary to get big ideas moving. What I bring to the team is building consensus and asking those questions about why we are here and why we are doing it this collaborative way. You can’t really push people until they trust you, until they understand what they need to do and why. When you are transparent with them, they are more willing to try new things and to do projects with you” (MONUM staff, August 6, 2021).

**Network governance.** Interviewees stressed the importance of two core network governance functions of boundary spanning and relationship management in expanding and maintaining collaboration for building innovation capacity. To expand a network of partners, MONUM used two informal mechanisms of boundary-spanning. First, the MONUM established personal relations through informal conversations, which could potentially be developed into
collaboration in specific innovation projects. This mechanism enabled the MONUM to build rapport and initial trust with key actors to start a collaborative relationship. One MONUM staff gave an example and said, “For me, it always begins with just getting coffee with someone and starting by asking about themselves more than the project. It’s so easy to jump right into what we’re working on, but knowing a person is the first step to getting connected. So trying to get to know a person’s knowledge or skills or personality and sharing about yourself, you’re establishing that trusting relationship. We had a female leader of a local nonprofit which focuses on healthy food and healthy eating. I had a few conversations with her and organized a virtual field trip with our Office of Food Access. Now they are working on a new lesson for citizens called ‘Plan on Nutrition’ together” (MONUM staff, August 6, 2021).

Second, the MONUM used an “open-door” policy to welcome any potential partners. It means the MONUM will say yes to meeting any Bostonian with an idea for how to address public or social problems in Boston. The MONUM had three hours set aside each week to meet with local entrepreneurs, nonprofits, agencies, and community members, for the influx of new ideas. It offered critical feedback, and if the idea were ready, identified the best party internally or externally to take the idea and run with it (New Urban Mechanics, 2017a). According to interviews, this mechanism seemed particularly useful when there were no clear solutions to public or social problems. An open channel of inputs added more possibilities to find new ideas for public sector innovation. One interviewee said, “it feels like an opportunity where a lot of the folks are able to just come in and be a little bit about who they truly are. And then try to think about how we can work together to create something new. I think for the rest of the city government, it is really easy to get entrenched in your department, being siloed. But you can
really go much farther when you’re collaborating and opening up rather than acting in your silo” (MONUM staff, July 15, 2021).

For relationship management, the MONUM applied more formal mechanisms to maintain a collaborative relationship. Formally, routine meetings were often held with all partners in specific innovation projects to communicate and speak with each other, sharing problems, concerns, suggestions, etc. Having clear and open communication with all parties involved enabled MONUM to learn updates in the innovation projects more quickly and reflects on what was needed to further build innovation capacity. The MONUM learnt barriers or challenges in the collaboration and quickly adapted procedures or resources or skills needed for enhancing innovation capacity. That further allowed the MONUM to better align resources and responsibilities among partners and manage changes so that they could utilize their resources more effectively, which further enhances innovation capacity.

In the example of autonomous vehicle testing, one MONUM staff said, “there’s a couple of different touchpoints we have with companies that allow continuous engagement. So, there’s a monthly call that we hold with each company that’s testing and with anybody that’s signed on to the memorandum of understanding and any of those communities. And that call acts as an update on testing. We talked through policies, we talked through funding opportunities sometimes, and about any lingering issues around licenses or permits. So it’s a pretty low threshold way to join and absorb those aspects and be part of that conversation to sort out what needs to be done in the next step. Down the road, we managed to bring everybody to the same ground about what companies need to do for road testing, and what responsibility the city bears” (MONUM staff, November 8, 2021). In this sense, the MONUM is able to openly discuss differences or even
conflicting ideas, opinions, or suggestions among partners, which helps to understand better and design better each partner’s role or responsibilities in the collaboration.

1.4 Knowledge and learning

Knowledge absorption. According to interviews, the MONUM’s ability to learn new knowledge from outside the city government is one of the key determinants of innovation capacity. The MONUM’s potential absorptive capacity was particularly important as it enabled the lab to acquire new knowledge and to find new opportunities for public sector innovation. Adding new knowledge to existing knowledge, the MONUM managed to filter newly learnt knowledge, adjust the existing knowledge base, and then increase its innovation capacity to propose new changes or ideas for public sector innovation. One city agency staff said, “I think MONUM is really good at poking around and getting themselves into different technologies. But the other departments are not, they’re focused. Like nobody in my team has the time to know about the type of research about the type of how to do a chatbot. They are doing a lot of other things. They are focusing on phone calls or emails to get back to residents. But the MONUM has that energy to find new ideas with chatbot. They let me know how other people used chatbot to provide information. I got new possibilities with their inputs” (City agency staff, September 22, 2021).

For knowledge acquisition in the potential absorptive capacity, two mechanisms played key roles to acquire new and external information: desk-top research work and field visits to other city governments. First, interviewees mentioned that desk-top research often involved searching local, state, and federal regulations, exploring academic research and practitioner reports and collecting and analyzing practices of exemplary city governments to address such public or social problems. In the process, dedicated lab staff focused their energy and time on explore new
knowledge about specific public problems, and external collaborators (organizations and citizens) were often involved to enrich the sources of new and external information. It increased the ability to acquire information from multiple perspectives. The research work was often considered as a starting point for innovation projects, given that it pulled information from multiple sources to build a holistic view of public policies or services, from which new changes would be identified and proposed. At the same time, it helped the MONUM to learn new knowledge about what is plausible outside Boston or even outside the public sector to further inspire new ideas or solutions.

In the example of affordable housing, one summer fellow conducted desk-top research to explore how Boston can provide financial support for the development of affordable housing. He mentioned that “I worked on a project examining different forms of housing cooperatives and what potential there was in Boston for growth and how the city of Boston might provide support in various forms. The primary methods have been reaching out to other folks in other cities to understand it and researching online to find documents, primary sources, or journalistic sources. I looked at other high-cost cities, such as San Francisco, New York, and Seattle, and compiled a list of different funding sources that they had leveraged for affordable housing creation. Those ideas went through a filtering process to understand which those might be options for the city of Boston. I also contacted people in the housing department. They shared what they knew about affordability in other cities. Some of them had families in other cities which also offered some affordability programs” (City agency staff, September 9, 2021). The interviewee further commented that “such a process allowed us to learn from other cities and filter it into the Boston context and understanding how it might or might not be applicable to the city and the government of Boston. It really helps to focus on specific policies after a broad search for large
policies or broad ideas. It might also serve to cut off ideas that are particularly innovative or radical because it could be determined that they’re not feasible within the scope of our government.”

Second, field visits to other city governments further helped to increase knowledge to enhance innovation capacity in the MONUM. It identified potential opportunities and trends outside Boston to inspire new ideas and solutions. One news report mentioned that “Through the International Urban Cooperation (IUC) program of the European Union, we have been able to get a healthy dose of inspiration from our colleagues in the Lyon Metropole. We are paired on two topics: the future of mobility and ‘smart cities.’ In particular, we both have goals to reduce single-occupancy vehicle trips. Here in Boston, we’re aiming to reduce driving alone rates by half, while increasing walking rates by half. During our three days, we started to uncover the breadth and depth of Lyon’s thoughtful approach to improving mobility for their residents. A few key takeaways have stuck with us, though we know there’s plenty more we can learn that will benefit Boston’s residents” (New Urban Mechanics, 2020).

For knowledge assimilation in the potential absorptive capacity, interviews showed that new knowledge and insights were widely discussed among its staff in the MONUM as well as with project partners. Through the iterative discussion and reflection, the MONUM weighed different perspectives and trade-offs in the new information and existing knowledge, which further led to new changes in the assumptions of government practices and citizens’ needs to update their knowledge base. Such updates in the knowledge base then further helped to identify new changes needed in the city government and were used to develop a theory of change for innovative solutions.
For example, to address the complaints about sidewalks, the MONUM combined and analyzed citizens’ complaints with sidewalk repair data from the Department of Public Work to find that the places with the worst sidewalks were not actually where the most complaints were coming from. They tended to be the worst sidewalks than to be in the poor neighborhoods. And those were neighborhoods that were less likely to complain. “This changed the whole model to think about how to improve the sidewalk and where to focus. They developed an alternate model for prioritizing sidewalk repairs that focused on where the sidewalks in are most need of repair and what are the most critical corridors for people on foot, people who are trying to access the public transportation system, places, parts of the city where people walk a lot. And so they were able to come up with the re-prioritization scheme that re-thought the whole complaint-driven model of sidewalk repairs”, said one city agency staff (September 16, 2021). Having such a reflection and filtering process, the MONUM was uniquely suited to manage risks with a thoughtful and careful approach to innovation that was not at all obvious how it was supposed to be done.

However, interviews did not show evidence that realized absorptive capacity, knowledge transformation and application, was important to determine innovation capacity in the MONUM. This was probably because the MONUM focused more on “quick move” to explore and test new ideas instead of implementation and maintaining innovation. The knowledge transformation and application process happened more in the specific city departments that were responsible to implement innovative solutions in the long term. According to interviews, the MONUM specialized in creating new ideas or alternative solutions to current public problems. It focused on identifying new changes in the city government that are different from current practices. In this regard, acquiring knowledge about what is different and new to the city government was
critical to increase its innovation capacity for proposing new changes. Such knowledge needed to be further applied and transformed into the rest of the city government to implement fully developed innovation outputs. The actual translation of innovative ideas to innovation outputs still takes capacity focusing on managing changes in the implementation of innovative solutions.

“We need to have some speedboats like the MONUM that are attached to that large ship that can Zig and zag, being the front runners to figure out where the ships should go and then figure out how to pull it. So, it can turn and point in that direction for the long haul. After that, the second thing is how to actually go back to the mothership and institutionalize the new direction. That is what the MONUM and the other city agencies need to find out, some space for refinement and implementation within other city agencies to further promote public sector innovation” (City agency staff, September 16, 2021).

Knowledge sharing. According to interviews, knowledge sharing among the team members was one of the important determinants to build innovation capacity in the MONUM. Interviews with the MONUM staff showed that knowledge sharing with the lab helped to build innovation capacity by keeping alive lessons learnt in the innovation projects and improving the lab staff’s skills to manage them. Both knowledge collection and knowledge donation were found useful for knowledge sharing so that the staff had more knowledge or expertise to better manage innovation projects. Most of them acknowledged the importance of knowledge sharing to allow other team members to utilize such knowledge to cross-fertilize more new ideas. The lack of such knowledge sharing in the rest of the city government often disconnected useful insights and ideas residing in different parts of the organization, which reduced innovation capacity for new ideas.
“When you think of the institutional level of government, we did a poor job in the knowledge management. So, when a person leaves, they take a whole chunk of expertise with them. We have to re-grow the knowledge with other people that take over the job. That is a huge waste of the use of knowledge resources to find new solutions. The MONUM has done a good job in sharing things they know so that I know there is a new software license in the IT department I could use for the chatbot project. I can use that to develop a system sending SMS to notify residents about access to free foods. Otherwise, I would only use open-source limited edition, which was not capable at all” (City agency staff, September 22, 2021).

For knowledge collection, interviews showed that staff developed documentation to record each innovation project and lessons (or insights) learnt from the innovation process. Those documentations were widely shared among staff in the MONUM as well as with internal agencies working together on the innovation projects. By sharing knowledge about innovation projects, staff in the MONUM learnt more about key barriers or challenges in doing innovation projects, learnt more about the specific context of Boston, and learnt more about techniques of how to better navigate the public sector innovation process. The MONUM was able to better aggregate knowledge acquired by individual staff so that it can increase its own knowledge base to build innovation capacity.

“I think we really try to do a really good job at the documentation of our projects so that when we were doing an after-action report on something that information stays with the city or with the team beyond what we were planning. And so I think that knowledge can be important in that regard” (MONUM staff, July 7, 2021).
For knowledge donation, the MONUM staff helped each other with their expertise and skills during the innovation projects when they were asked for. Leaders often spent time helping the staff solve problems in managing innovation projects. The MONUM also developed a friend group that enabled the lower level of staff in the city of Boston to donate their expertise to increase innovation capacity. The interviewees mentioned that this knowledge donation helped staff to better tackle challenges or issues they have in conducting innovation projects. Because of helping each other among staff, the MONUM was able to leverage individuals’ expertise and skills better in the exploration of new ideas and management of innovation projects.

“Our team members are curious people. They like learning new things. So, I can certainly think of some team members that have just developed some of those new hard skills on their own. But somebody is really good at mapping or figuring out how to set up a code base and they will take a couple of hours of that person’s time to help them understand that scale. So, we certainly encourage that”

(MONUM staff, August 9, 2021).

Learning orientation. According to interviews, the learning orientation was perceived as key to innovation capacity in the MONUM. It was reflected in the MONUM’s open-minded lab staff, innovative organizational culture, and open-ended organizational ideation procedure. Such an orientation toward learning helped to build innovation capacity since public sector innovation required new knowledge to identify new changes in the existing way of operation in the city government and because knowledge became obsolete quickly in the rapidly changing and turbulent environment. Being open-minded toward learning, the MONUM managed to reflect upon the existing procedures and assumptions to renew and update its knowledge base that built innovation capacity to initiate new ideas or proposals for public sector innovation.
For example, the MONUM designed a local business rewards app\textsuperscript{6} to incentivize Boston residents to spend at local businesses (e.g., restaurants, grocery stores, and among others) during the pandemic. The market and sale tools for the local business needed to be changed, with the social distancing requirements and the high cost of online delivery services (e.g., Uber or Grubhub). Given the unprecedented nature and scale of the COVID-19 pandemic, the MONUM’s own knowledge of local economic cannot fully address the problem. It reached out to local restaurants and grocery stores to further understand their needs for local delivery services and challenges to make profits during the pandemic. It also reached out to startups and non-profit organizations to find potential tools that make delivery services at a lower cost. Eventually, the MONUM developed new insights and knowledge which were further translated into the design of an app for local business rewards, fitting the specific needs of local businesses and residents during the pandemic. One MONUM staff said, “the pandemic really challenged what we have learnt before about the food system. Local restaurants were struggling a lot with the point-of-sale systems in accepting EBT cards. They did not get much money out of Uber or Grubhub because they paid a lot of fees. Talking with those restaurants, I learnt a lot about their new struggles in attracting customers. I got new knowledge of those local businesses, and that led me to this local business reward app. Just bring together the people involved, talk about how it went, how it could have been better. Just making sure that you’re learning from those experiences” (MONUM staff, August 6, 2021).

In addition, commitment to learning further helped to build innovation capacity by improving the lab staff’s skills and expertise. One lab staff said, “Our team members are curious people. They like learning new things. So, I can certainly think of some team members that have just

\textsuperscript{6} Residents were rewarded by credit points when they make purchase in the local business. Those credits were available to make payment or discount in other local stores or restaurants.
developed some of those new hard skills on their own through skill share on the team” (MONUM staff, June 3, 2021). Because they were eager to learn and explore, MONUM staff were able to add more insights or resources and learn more techniques to manage those resources more effectively for the development of public sector innovation. As one summer fellow mentioned in his blog, “curiosity is something that MONUM encourages. They believe the questions we ask are as important as the answers. They also believe that valuing a beginner’s mindset helps us to achieve progress. I entered this position as a beginner in the field of civic design” (Olson, 2021).

2. Summary of the MONUM

In a short summary, the findings first showed key determinants in the four dimensions: resources, management, collaboration, and knowledge that influenced innovation capacity in the MONUM. According to interviews and collected information, the MONUM’s resources, a dedicated team of staff with diverse backgrounds, and a high level of expertise for innovation, in particular, was key to building innovation capacity. A dedicated multidisciplinary team of staff enabled the MONUM to acquire new knowledge, insights, or tools that were not thought about before to drive new ideas or solutions. Flexibility to use funding for innovation further enabled the MONUM to explore new ideas more quickly. The use of information technology, however, did not seem to be the main determinant that influence innovation capacity in the lab.

In addition to resources, the ability to use resources for innovation was also key to innovation capacity in the MONUM. The leaders of the lab play key roles in developing innovation strategy, aligning with the city government, protecting lab staff from critiques, and nurturing innovative and risk-taking culture in the lab that established the legitimacy of the MONUM to use resources for innovation. The lab leaders’ protection helped to increase the lab staff’s motivation to take
risks and to have a certain level of autonomy to utilize resources for innovation projects. Leaders also played a key role in increasing connection with both internal and external partners to increase resources and knowledge for innovation capacity in the lab.

Further, the MONUM’s broad and strong collaborative relationship with actors inside and outside the city government, especially research and non-profit organizations, enabled it to acquire and use various information, knowledge, and expertise that helped to find various plausible answers and to identify new changes needed in the city government without constrained by public employees’ bias or blind spots. It further increases new knowledge in the lab to enhance innovation capacity. Its knowledge absorption and sharing, focusing on bringing external new knowledge, allowed it to filter newly learnt knowledge, adjust the existing knowledge base, and then propose new changes or ideas to develop public sector innovation. Eventually, the new knowledge acquired and assimilated in the lab increased its innovation capacity to propose new changes and alternative solutions in the city government.
CHAPTER FIVE

THE SEATTLE CITY’S INNOVATION AND PERFORMANCE TEAM (THE SEATTLE IP)

The Seattle City’s Innovation and Performance Team (the Seattle IP) was established in 2017, by merging an existing innovation team that had been funded by Bloomberg Philanthropy and a city-wide performance team that focused on city government performance. It acted as a unit that add innovation capacity, in particular capacity with data, design, project management, and collaboration, to find creative solutions to improve the government’s interaction with citizens and to meet their needs. The main source of funding has been the city government’s general budget since the Bloomberg funding runs out in 2017. Currently, the Seattle IP is a team of eight members located in the City Budget Office under the Mayor’s office.

Focusing on the mayor’s priorities in city affordability, transportation, and smart city, The Seattle IP managed to initiate eight innovation projects in Affordable Housing, COVID-19 Testing, Youth Development, FireSTAT, Performance Metrics, TNC Driver Policy, Utility Discount Program, and License and Permitting. Among them, COVID-19 Testing, FireSTAT, Performance Metrics, and License and Permitting are further implemented and managed by specific city agencies to become new public services and policies.

Interviewees described the Seattle IP played an important role to allow city agencies to take risks, try new ideas iteratively, and learn from mistakes until new solutions work well. It managed to support new ideas to emerge and to be tested for further improvement and implementation. One IP staff explained, “the Seattle IP is bringing added capacity to city government and thinking of new ways to implement services for residents or even just thinking like internally, how would we work differently? Oftentimes, government is seen as not

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7 For the full list of innovation project in the Seattle IP, please visit: [https://www.seattle.gov/innovation-and-performance/past-projects](https://www.seattle.gov/innovation-and-performance/past-projects)
innovative and not innovating fast enough. What we are able to do is to add capacity with data, design, project management, and partnerships, and really thinking of new creative ways to improve how we interact with our residents, how we better steward tax dollars for our residents and get them what they really need” (Seattle IP staff, July 29, 2021).

1. Determinants of innovation capacity in the Seattle IP

Interviews and documents highlighted key determinants of innovation capacity in the Seattle IP in the four dimensions: resources, management, collaboration, and knowledge. According to interviews, in the Seattle IP, it was important to have a multidisciplinary team with high levels of diverse educational and professional backgrounds to build its innovation capacity. Combining administrative data to analyze organizational performance and human-centered design to explore new ideas or solutions was another key to innovation capacity. Connection with internal city agencies and technology companies in the region further helped to increase knowledge and resources that added to innovation capacity. However, the lack of external sources of funding seemed to limit the Seattle IP’s innovation capacity by limiting its flexibility to support more innovation projects. The insufficient network governance led to a lack of close and wide partnerships with external actors and limited innovation capacity in the lab.

1.1 Resources

**Human resources.** Interviews with the Seattle IP and city agency staff showed that a dedicated team of staff focusing on public sector innovation was a key determinant of innovation capacity in the lab. Eleven out of 14 interviewees mentioned that compared to other city agency staff outside the lab, the Seattle IP staff’s sole job responsibilities were to develop new solutions to public or social problems. This granted the Seattle IP freedom from day-to-day operations so that it was able to pursue creative ideas. The lab staff were able to focus their energy and skills
on identifying new changes and innovative solutions that are alternative to current government practices. It also allowed the lab staff to have time to deal with the barriers and obstacles in the innovation processes, which would be challenging with other day-to-day tasks. Focusing on their energy on innovation projects, the staff managed to apply new methods and absorb new knowledge that were not thought about before to drive new ideas or solutions, which ultimately build innovation capacity. This was explained by one of the Seattle IP staff.

“I think why we have more capacity is because we’re given more freedom to do that exploration and thinking differently. If we are curious about something, we can go explore it. If a department has never done a journey mapping workshop, we can go and do that if that’s what helps them at the moment. But in other departments, they have their own routine tasks that take up most of their work time. Even though they have money, they do not have the free time to think differently, while we are able to do so to really get new things initiated and help to be creative” (Seattle IP staff, September 30, 2021).

Second, staff with a high level of educational background and professional experience was another important determinant of innovation capacity in the Seattle IP. Figure 5.1-5.3 showed that all the Seattle IP staff have a high level of education degree and have been working in the professional fields of public, private, and non-profit sectors. It helped to build innovation capacity by increasing project management for innovation. According to interviews, the lab staff have a high level of skills and expertise for managing innovation projects as well as new methods or tools (e.g., human-centered design and data analytics). Such skills and expertise allowed the Seattle IP to navigate ideation of innovation process, linking the abstract visions with the concrete ideas of innovation. The lab staff’s knowledge and expertise increased
knowledge in the lab and managed to tackle unexpected challenges in the innovation process and monitor project progress to achieve innovation outputs.

“In an environment of city government, you will have to navigate through internal obstacles to innovation, like bureaucratic silos or lack of resources. You will need to equip with strong project management skills with other expertise to tackle those challenges from start to finish. They [the Seattle IP] have the ability to see the start to finish and be able to picture what that looks like and have the tools to communicate that. They are formally trained to be able to explain what this looks like and use established structures or protocols to get from point A to point B. They organized the process in such a way that all parties know what the steps we are in and what to deliver and what to expect in the next stage. When there was some information we don’t know where to get, they have the ability to find that really quickly” (City agency staff, October 7, 2021).

![Figure 5.1 Highest degree achieved by staff](image)

![Figure 5.2 Major achieved by staff](image)
In the example of the COVID-19 testing site\textsuperscript{8}, the combination of multiple skills and expertise for innovation played a key role to create a new online appointment system and a new process for testing. One Seattle IP staff explained, “I think we’re able to add a lot of capacity to improve the COVID testing work. It is because we have different skillsets in our team to come up with different components in the testing solutions. First, [Seattle IP staff one] focuses on data analytics, they know how to look at different trends and data to help inform communications or provide insights into why people are not doing testing enough based on data. And then [Seattle IP staff two], specialized in human-centered design, doing research, went to testing sites by herself to really get at the feeling and needs of how residents or whoever we’re talking to are feeling in the testing process and helped inform changes that we should make. [Seattle IP staff three], with his coding skills, worked with [Company Name] to customize the online appointment platform to the needs of our residents and our health departments and testing sites. Eventually, the online tools, combined with a modified testing process were to go in a very short

\textsuperscript{8} COVID-19 testing is a project to design a front-end experience and registration system that provides accessible testing to the residents of Seattle. The Seattle IP worked with the Seattle Fire Department, the University of Washington (UW) and Solv, a healthcare startup to create the system that had an appointment system, collect insurance, create a mass lab requisition, and leverage the barcode system and portal. https://bloombergcities.medium.com/how-human-centered-design-helped-seattle-double-down-on-covid-testing-e76681483a98
period of time. It was really amazing to see how this new process and tools worked out with all of our team members’ skills in the whole process” (Seattle IP staff, July 29, 2021).

Third, the interviews showed training in skills and expertise was important to build innovation capacity in the Seattle IP. This helped to build innovation capacity by upgrading the lab staff’s skills and expertise. Since new methods or tools were often needed to create innovative solutions to increasingly complex public problems, according to interviews, training allowed the staff to re-new their tools and methods to explore those problems with no clear answers. Training enabled them to have access to up-to-date information and knowledge about public sector innovation so that they can bring that new knowledge to discover new ideas or solutions to those problems. To do so, the Seattle IP provided financial support for the staff to take courses from universities and get certificates in data analytics, human-centered design, and project management to improve their skills. Further, the Seattle IP staff attended method workshops held by universities and philanthropies that increased their own knowledge or expertise. One Seattle IP staff explained the importance of training in keeping up with the development of IT to support public sector innovation.

“You can imagine the IT world and the world of data is constantly changing in a hallway. There’s a need to remain current and up-to-date, and come up with the ability to balance what I have and what I need to have. Otherwise, I may not understand where to go when we need to improve our performance data management or we need to improve our cybersecurity” (Seattle IP staff, August 12, 2021).

In spite of a dedicated team of staff with diverse expertise and knowledge, the small size of the team limited the innovation capacity in the Seattle IP. All interviewees in the Seattle IP
suggested that the lack of sufficient human resources has limited its capacity to take upon a larger amount of innovation demands and requests in the city government as well as to follow up with the current innovation projects on an ongoing basis. The overwhelming workload may negatively impact the wellness of the IP staff and influence their own innovation capacity.

“Our team is so small and there’s only five or six of us at the time. And so sometimes, we get to pull into a lot of different things, and it can be difficult. We need more team members. In terms of the skills that people have, I think we’re able to add a lot of capacity to the work that we do in the city. But eventually, it would still be limited because of all the different things we do and we cannot do all the things at the same time” (Seattle IP staff, July 29, 2021)

Financial resources. According to interviews, the Seattle IP’s funding for staff comes from the city government’s general budget, and its funding for innovation projects is supported by other city agencies’ budgets. The allocation of the funding often requires budget approval inside those city agencies. This may reduce the flexibility in using the funding for innovation projects. One Seattle IP staff mentioned her struggle with funding, “I think it really depends on the investment in the project. I think it’s hard to convince people that there is a new need for funding for the project. It is hard to convince people that you should give us however much budget and let us build this team and this project. And then it can be deployed across departments. Due to the lack of convincing, we sometimes do have trouble in finding money for projects we would like to initiate” (Seattle IP staff, September 30, 2021).

The Seattle IP staff mentioned that the lab was strategically collaborating with city agencies with more financial resources to support public sector innovation. The Seattle IP was responsible for initiating new projects that would be further sponsored and implemented by other city
agencies. The initiation of innovation projects often did not require funding from city agencies but the lab staff’s time and energy to conduct research and exploration of new ideas. When initiating the project and generating new ideas, the lab helped city agencies to figure out financial investment to fund extra staff or equipment for new service delivery. The initial design of new ideas, therefore, led to additional funding from city agencies to implement alternative solutions to a larger scale. In the example of FireSTAT\(^9\), one Seattle IP staff said, “the department funds you for the project itself. Our team does not provide actual payment for the project. What we provide is valuable to them is our skills and expertise to find where the problem is and what we can do about it. Money is not quite needed at the beginning, but people is needed who actually do the exploration. In this work we’re doing with fire data, it’s going to result in an infrastructure being built out in the cloud. The fire department is going to be responsible for those monthly charges. At the beginning, we helped them to analyze the operation data and to build a demo of visualization. As we developed the solution, we had their buy-in and funding for building the prototype before we began developing it. And as we get closer to implementation, we’re going to set up the actual mechanism with those charges and the fire department needs to prove how those charges will be billed out” (Seattle IP staff, August 12, 2021).

In other cases when an emergency happened, the Seattle IP was able to build innovation capacity by acquiring various sources for specific emergencies being prioritized. In the case of COVID-19 testing, which was prioritized by the city government, the Seattle IP managed to absorb various sources of funding quickly to initiate and test new online tools and the COVID testing process. Benefitted from the subsidy from the federal government and funding from the

\(^9\) The FireSTAT program and the data warehouse provides a one-stop shop for a growing number of data sources, allowing easy analysis, visualization, and export. https://www.seattle.gov/documents/Departments/Performance/IP%20Case%20Study_FireSTAT. pdf
University of Washington, the Seattle IP was able to set up testing facilities and purchase testing equipment to develop new testing sites. “This project specifically had a lot of different funding resources. And the benefit is that we are a governmental agency, and so we’re able to apply for different funds from the federal government to help subsidize testing. And so there were a lot of funding sources actually created right away for us. The Seattle IP did not contribute funding to it. But what they were able to contribute was the people with experiences in doing innovation work, which was far more important than just money. You need them to guide you through the dynamic testing process to figure out where to improve and where to make the investment”, said one city agency staff (December 3, 2021).

**Information technology.** Interviews with the Seattle IP staff showed that the use of information technology was one key determinant of innovation capacity in the Seattle IP. In six out of eight innovation projects, IT has been a central component to create new solutions. Among them, four innovation projects involved the design of an online platform to disseminate information to citizens or to provide online channels for service applications. Two innovation projects involved the design of ICT tools for automating and visualizing administrative data to inform management and operations. As one Seattle IP staff explained the focus on using IT, “we’re one of those teams that do not believe that you have to have technology at all for something to be innovative. But those projects did have a blend of those different areas in technology that I mentioned. We apply those various skills depending on the problem we’re trying to solve. We are benefitted from the technology companies in the Seattle and King County” (Seattle IP staff, June 23, 2021).
Information technologies helped to introduce new changes in the public service and digital transformation in the city government. In the example of CiviForm\(^{10}\) for affordability programs, the use of IT helped the city government to innovate in terms of how to streamline this process for a one-stop-shop. One city agency staff said, “prior to the pandemic, you have to go into a lot of our departments in person to be able to receive services. And I think with technology companies, the Seattle IP is helping different departments think through what are the lessons that you’ve learned over the last 16 months. And how can we improve, with the use of online platforms, because of the pandemic and offer a different way for residents to engage with your service” (City agency staff, October 7, 2021).

In addition to IT, the use of data was helpful in the Seattle IP to build its innovation capacity. Those data analytical tools helped the lab to collect and analyze data more quickly to show the trends in performance in each city agency. Such data showed how effectively the city agencies delivered public services and revealed problems the city government had. Seeing the problems, the lab staff further reflected on those trends in the data and to discover new insights into why specific issues in public management are happening. The lab staff’s reflection increased new knowledge in the lab to inform new changes in urban management for better public services or policies, which increased its innovation capacity. One Seattle IP staff said, “you are using the data as a starting point to really think about the reason behind that and how the city can really come up with this new thinking, new ideas to improve the performance. It’s going to tell us a snapshot of the issue, but it’s not going to solve the problem. It could potentially give us some guiding posts in terms of whether things are improving or not improving if we’re getting a little bit better in a certain way. What is needed is that our team digs into the data and find what is

\(^{10}\) CiviForm is an application tool that integrates with Affordable Seattle and cuts down on the time and paperwork required to sign-up for programs. The tool assists City programs to easily harmonize application data requirements.
happening behind it. Try to find what the data means for real people in the real world and what to change to improve the performance” (Seattle IP staff, December 2, 2021).

In the example of FireSTAT, by converging various datasets, including 911 call data, incident response data, ambulance dispatch data, and among others, the Seattle IP built up a platform, which provided data in a more digestible and accessible format, to look at trends and hotspots and further help the fire department build new decision-making model in real-time.

“They have incident response data. They receive a data feed from a private ambulance company that handles a lot of transportation for them. They have very detailed EMS data. They had 911 call data. But those are all disparate data sets. And they’ve never had the ability to bring all of that into a single repository and combine it together which, as we’re building this out, gives them the ability to look at the life cycle of a 911 call from the time the person makes the phone call until the in some cases, it ends up with a person being in the hospital. So, they can look at the entire lifecycle call. They can look at how they’re doing, they can look for outliers. They can look at trends of the calling, or places where most calls were made. In the end, this is all useful in the improvement of service delivery” (Seattle IP staff, August 12, 2021).

1.2 Management

Leadership. Eleven out of 14 interviews with the Seattle IP and city agency staff showed that the lab leader played an important role to build innovation capacity by managing innovation projects, offering protection for the lab staff, promoting the Seattle IP in the city government, and networking with partners for additional resources.
First, the lab leader helped to build innovation capacity by directly involving in the innovation projects and providing knowledge to overcome barriers in the process. According to interviews, the leader of the Seattle IP was perceived as an individual who has abilities to successfully run different projects in the organization. The leader, with her experience in project management and public management, helped to increase knowledge and expertise of the lab staff to tackle challenges in the innovation process. One city agency staff said, “what I do know is [the leader of the Seattle IP]’s reputation is sparkling, and she has been known as an individual to have been a part of lots of different meaningful projects. And I think that that’s given her lots of credibility to lead us in conducting projects for new solutions. She also helped her staff to acquire new knowledge and techniques for project management from innovation workshops. She is known to know a lot about a lot of different aspects of the city government and helps to put pieces together. This was particular useful in the project of affordability program. Either you need some information from another department, or you need technical folks to help with the data, or you get lost in where you are in the project. When an innovation project did get stuck, she became a key person to turn to and helped you dig through some barriers along the way” (City agency staff, November 8, 2021).

Second, such a leader further provided protection for the Seattle IP staff from being unfairly treated. This helped to increase the lab staff’s motivation to pursue innovative solutions. The staff felt empowered to initiate new ideas and innovation projects, which added to innovation capacity. According to interviews, the leader enabled the lab staff to take risks for experiments and were motivated to challenge the bureaucratic traditions, knowing that the leader offered full support to take critiques. One city agency staff said, “they [the Seattle IP staff] feel empowered and emboldened and supported to keep doing big, bold moves, knowing that [the leader of the
Seattle IP] has got their back. And I think that that’s very important especially in the innovation team because things could go really wrong. This is all exploratory and experimental. Without the leader’s protection, like in other departments than the lab, those non-traditional thoughts would just be thrown away, because they are so different. But with [the leader of the Seattle IP], she would go deep on those with her team, and end up setting people up for fulfilling those ideas” (City agency staff, October 7, 2021).

Third, the leader played a key role in articulating the importance of public sector innovation and building innovation strategies. This helped to build innovation capacity by actively promoting the lab and increasing its legitimacy to use resources for innovation. Interviewees mentioned that the leader has been advertising the added value of the Seattle IP to the mayor and further aligning the Seattle IP’s strategies with the mayor’s priorities. This allowed the Seattle IP to gain support from the mayor and to increase its legitimacy among other city agencies to obtain human and financial resources for innovation projects. One Seattle IP staff said, “Our director does a quarterly report out to the mayor’s office. So, we, as a team, get visibility on everything that the team was working on and everything the team has accomplished. This also allowed us to check if we were on the right track or if things changed so we needed to adjust our strategies in certain projects. We need to be close with the mayor so that we have the support to do things differently. It certainly gives us a lot of credibility. The leaders also give us their attention and further resources to explore alternatives. So, there are a lot of times where deputy mayor will reach out to our director and say I needed a team to start looking at and to partner with the human services department and start looking into this or that” (Seattle IP staff, August 12, 2021).

Finally, the leader helped to build innovation capacity by increasing network with people within the city government for additional resources. According to interviews, the lab leader acted
Vision and strategy. According to interviews, first, a vision toward public sector innovation and a specific innovation strategy focusing on data and design was key to innovation capacity in the Seattle IP. The mission statement said, “we envision a collaborative and innovative city government serving a community where everyone thrives. We partner with city departments using data and design to creatively solve problems.” According to the Seattle IP staff, there were three key priorities for the lab: (1) create tracking and progress towards achieving identified city priorities, (2) elevate the city’s profile as a driver of innovation and performance, and (3) build IP’s infrastructure and culture to maximize performance. This vision toward innovation increased the lab staff’s motivation toward innovation and focused their time to investigate core issues in the city government and to explore new solutions to those problems. This also drove the
development of procedures and culture in the lab to better utilize resources for idea exploration, which would be further demonstrated in the sections below.

Further, the strategy of combining data and design was perceived as critical to building innovation capacity in the Seattle IP. The two aspects complement each other to enable the Seattle IP to increase their own knowledge for new ideas of innovative solutions. One of the lab staff explained, “I think the way that we’ve brought together data and design is that the most valuable and smart. We found it particularly useful to find facts and underlying reasons behind those facts. Data serves as the jumping-off point for our analysis, while talking to people about their experiences, getting to know them helps us really get more in-depth about what solutions should we be driving towards and helps us break down assumptions. Two parts serve each other. The human-center design gives us stories and the data allow us to evaluate whether we are doing the project in the right way. Missing either of them would miss a major element you need to develop a truly useful innovative solution” (Seattle IP staff, December 2, 2021).

Second, interviews with the lab and city agency staff further showed that alignment with the priorities of the mayor’s office and overall strategy in the city government was another important determinant. As stated in the previous section about leadership, it enabled the lab to build innovation capacity by creating a network of city agencies and building the legitimacy of the Seattle IP to use resources for innovation that were substantively different from government routines. The alignment further allowed the Seattle IP to acquire additional human and financial resources from other internal agencies to support innovation projects.

For example, by focusing on the affordability program, which was one of the mayor’s priorities, the Seattle IP managed to create a task force with key city staff from the Department of Education and Early Learning, Seattle Department of Transportation, Seattle IT, and Seattle
Parks, and Recreation to develop an online platform for affordability program application. Because this is one of the mayor’s priorities and all those agencies’ missions and tasks were relevant to affordability programs, they were interested to work with the Seattle IP. Those agencies further tested the feasibility of cross-enrollment across programs. One city agency staff said, “I think this reflected a recipe for success in terms of aligning the mission and keeping going with the individual departments. That helps us go into projects knowing what skills or resources are there and are needed to make sure the project is going to live on. Otherwise, departments would not be interested in making the investment or be bothered to innovate. What those agencies provided were valuable. For instance, how they interact with each other in affordability programs, what challenges they had in the process, what tools they have to provide services. They designated their staff to communicate with the IP team and kept exchanging key information” (City agency staff, November 8, 2021).

The Seattle IP’s leader seemed to play a key role in keeping alignment with the mayor’s priorities. According to interviews, the change in the priorities caused damage to the innovation capacity in the lab since it may disrupt the continuity of the resources or skills in the Seattle IP to build innovation capacity for certain innovation projects. The lab leader adapted the Seattle IP’s strategy and vision over time to the changes in the leadership of the city government. The adaptation helped to continuously build innovation capacity by better meeting the changing needs of public sector innovation in the city government. One Seattle IP staff shared that “the mayor before the current mayor was all about data and performance, while the current mayor was more about human-centered design, focusing on citizen-side. So, we went through a pretty radical shift in design thinking. It is not necessarily a bad thing, but it takes a while to merge two elements. Right now, we are going through this again. We are shaping our mission, our goals, to
pitch ourselves to the cabinet. It does feel a sense of discontinuity and does not give us a lot of time for us to be mature in those skills. If you don’t allow it to mature, I think that’s when you start to see these teams dissolved” (Seattle IP staff, September 30, 2021).

**Organizational structure and procedure.** Eight out of 14 interviews mentioned that positioning in the mayor’s office was one of the key determinants of innovation capacity in the Seattle IP. It helped to build innovation capacity by providing the lab’s a certain level of legitimacy and autonomy to take risks for public sector innovation. Compared to the rest of the city government, the Seattle IP was not constrained by specific performance metrics and had freedom for the Seattle IP from the pressure of performance consideration. It enabled the lab staff to utilize resources to explore innovative solutions that often do not have clear return of investment. This further motivated the lab staff to explore new insights and knowledge that have not been discovered before for alternative solutions to public problems. This was explained by one Seattle IP staff in the following quote.

“I think that’s the beauty of our team. We don’t necessarily have a stereotypical charge. Whereas other departments, like the office of housing, they’re really focused on housing, but we can be a little nimbler and more flexible because we’re not really tied to meeting a service goal or there’s isn’t that kind of quota. I think that’s why we can jump in and do research if we want, which a lot of people do not have that freedom. For example, I go into the police department, saying I don’t care what politics are happening right now. We need to figure out this problem and here is the process that we could do this” (Seattle IP staff, September 30, 2021).
In addition to organizational structure, interviews showed that an ideation procedure, following the design thinking process, was another important determinant of innovation capacity in the Seattle IP. Combined with other data analytical techniques or methods, such as visualization, and quantitative survey data, the procedure helped to build innovation capacity by focusing the lab’s working procedure on innovation to speed up the ideation process. Figure 5.4 shows this idea generation procedure in the Seattle IP.

![Stanford d.school Design Thinking Process](image)

**Figure 5.4 Idea generation procedure in the Seattle IP**

Note. Adapted from Design Thinking Bootleg, by Stanford d.school, 2018. CC BY-NC-SA 4.0.

First, according to interviews, such a procedure helped to speed up the ideation by bringing in diverse perspectives to increase new knowledge for understanding core issues in the public or social problems. Starting with a series of scoping questions, the procedure helped to reflect upon city agencies’ assumptions on public services and policies, bringing in new knowledge to break their own bias to identify new changes needed in the agencies that have not been discovered
before. One Seattle IP staff said, “the idea generation procedure helps to get down to the root cause of the problem and utilize those insights or integrate different perspectives to think of what good solutions are to test, try, iterate, prototype on. We start by looking at what’s the problem they’re solving, what are their goals, and what’s in and out of scope for the project risk. What data do we know that we have? What’s the general timeline that they’re aiming for? Who is it going to impact? Is it residents or internal employees who we need to partner with and really look at like, if this is successful, what changes are going to make from a racial equity standpoint? And so that really gives us kind of a bird-eye view of what the overall project will look like” (Seattle IP staff, July 29, 2021).

In the example of FireSTAT, the Seattle IP staff brought in the Fire Department Chief, the frontline firefighters, and other bridge captains to explore a new way to present operation data for better emergency management. By learning the process of firefighting from different actors, the Seattle IP managed to identify half of a dozen different data sources that were perceived useful but were missing from the original performance panel. It also helped to redefine some key performance metrics, such as response time, and provided new calculation methods for metrics that better measure the performance of each fire station. Those new insights, according to interviews, were not discovered before but helped to create changes in how to measure the performance of the fire department.

“The IP began to learn things like the station captains need to file a report every month. And they have to go to half of a dozen different sources to get their information. If we pull all that together and we set up some visualizations, they don’t have to do that anymore. Because when the chief wants to see his monthly report, he could change the filters and he could see the status of all of the stations
individually, or however he wants to group them. We sat down and we looked at this table of key performance indicators, and we went down one by one, explaining what does each one mean? What are they measuring? How are they measured? Why are they important? Why are these measures of interest to the chiefs or the leadership? And then from there, how else could we potentially visualize this? Or what are some other layers to add to this or not right now? This was critical for us to find other ways that we could be presenting specific elements that the department might want to look at” (City agency staff, November 8, 2021).

Second, running small-scale tests to explore both pros and cons of new ideas, the procedure allowed the innovation capacity to be built by adapting quickly to the emerging needs or changing situations along the innovation process. This was evident in those technological innovations being tested. Interviews with the Seattle IP staff showed that those tests allowed them to find errors or flaws in the initial design of the online platforms or data warehouse so that they can make the improvement more quickly with lower cost than making changes in the later stage. This, thus, enabled the Seattle IP to absorb risks with a smaller cost and to manage new changes needed for innovation. One Seattle IP staff said, “we’re here to work with you if you run into a problem. And we’re here to basically be a thought partner to you if you’re looking at what was done, and you’re thinking about how would I extend that out to do this other new thing? We’re here to be a thought partner with you to help you think through it and to support you along the way, if need be” (Seattle IP staff, August 12, 2021).

Organizational culture. Having an innovation-oriented, risk-taking, and citizen-oriented culture was an important determinant of innovation capacity in the Seattle IP. Interviews with the
Seattle IP and city agency staff showed that, first, an innovation-oriented culture helped to build innovation capacity by increasing the lab staff’s motivation to explore out-of-box thinking and new ideas. According to interviews with the lab staff and city agency staff, the Seattle IP had a culture of excellence and ambition, which drove the lab staff to think from a strategic level to achieve big changes and transformation in the city government. Further, the innovative culture encouraged the lab staff to be creative and open-minded, being free from existing practices or constraints in government operations, so that they were motivated to identify new changes needed to create innovative solutions.

“I think not everybody has the mindset as we do. We have more of a growth mindset, while others were less so. We are showing them these are the things you should always think about new changes regardless of what you’re doing currently. I think that really sets us apart in terms of what we’re able to achieve, even though we’re a small team, compared to other departments sticking to their old ways of practices. We are freer from old traditional ways of doing things. They might not be able to think beyond the day-to-day problem that they have in front of them, but our team is able to see” (Seattle IP staff, July 29, 2021).

Second, tolerance toward risks and mistakes and learning from failure was another determinant of innovation capacity in the Seattle IP. This risk-taking culture was cultivated by the lab leader who provided protection for the Seattle IP staff from being unfairly criticized for failure or mistakes. Such tolerance toward risks and mistakes helped to build innovation capacity by encouraging the lab staff to spearhead into new solutions that might be criticized for potential failure. Not afraid of being criticized by failure, the lab staff were motivated to explore bold new ideas that are associated with risks and ambiguity.
“We are being open to ambiguity. It's exploring what innovation is. Is it something we're reinventing the wheel? Or is it something we just need to make better? We are often in a place of unclear. But I guess it is OK for us to step into it and make it clearer to solve the problem we had. We are open to trying something new and different iterations of that new idea, to assess and reiterate and revise. That is quite different from other agencies, where failure was not appreciated. To us, failure is acceptable. It is not we are bad at it forever. We can improve based on what we learn from failure” (Seattle IP staff, September 30, 2021).

It also helped to see failure as an opportunity to learn and improve so that the lab further built its innovation capacity. Because of the mindset that failure is acceptable, the Seattle IP staff were open and transparent about the failed cases and discussed them with participants to learn new lessons or insights. The interviews showed that they drew valuable lessons from those failures which helped them further upgrade their skills and expertise so that they have more knowledge to manage changes in the innovation.

“It gives us a little flexibility to test some things out, to try to iterate if we fail to learn from our failings and to be really transparent about it. So I think innovation is just another word of continuous process improvement because we can learn from those mistakes and then stumble off on something that works really well” (Seattle IP staff, October 12, 2021).

Third, while the Seattle IP had an orientation toward big and ambitious changes in the city government, such big changes were often driven by citizens’ needs and public value. In this respect, the lab emphasized collecting feedback from various community groups and weighing
those competing interests to increase its knowledge base for public sector innovation. It allowed the Seattle IP to learn life experiences from citizens to re-order the knowledge to further identify those changes in new idea exploration. The blogs and news reports showed that citizens’ inputs drove the lab staff to reflect upon the use of resources and their own knowledge to build innovation capacity.

“The Innovation Lab provided an opportunity for a diverse group of voices and perspectives to inform solutions to problems that affect real people. This is a departure from how City governments normally do things. Typically, cities will conduct some method of outreach to the community but do not usually invite residents to develop solutions together. This process was successful in exposing city staff to design thinking and the power of designing with and for the people at the center of a problem. It was also fun and sparked some great discussion among people who don’t usually interact with each other” (Sanchez, 2018).

1.3 Collaboration

Intra-organizational collaboration. Interviews with the Seattle IP and city agency staff showed that collaboration with other internal city agencies was an important determinant of innovation capacity in the Seattle IP (a full list of internal partners is shown in Appendix D3). Such collaboration helped to increase innovation capacity by bringing in subjective matter expertise and resources to increase knowledge in the Seattle IP for innovation. First, eight out of 14 interviewees mentioned that city agency staff’s subject matter expertise was needed to create new solutions to wicked public or social problems since those issues often fell within the responsibility across various domains of professional expertise. Through collaboration with internal city agencies, the Seattle IP managed to absorb new knowledge from different city
agencies, integrate different perspectives from vertical domains, and increase knowledge about
government operations so that the lab could increase innovation capacity to generate new ideas
or alternative solutions. Through being in the mayor’s office and lab leader’s networking, the
Seattle IP managed to break silos among different city agencies and acted as an information hub
to aggregate subjective matter knowledge to increase innovation capacity.

“I want to give credit also to our department colleagues who are the subject
matter experts on these products that we do. That allows us to learn and reflect a
lot. Often, those projects have a blend of those different areas that I mentioned,
like technologies, housing, education, transportation, infrastructure, etc. We
apply that various knowledge from our internal partners depending on the
problem we’re trying to solve. I think it is showing the value of partnering across
departments and working together rather than having these siloed ways of
keeping information to yourself. They were really helpful to us to know what is
key in their expertise, what they heard is useful to this innovation work. When you
are working on something and then you’re hearing other ideas or getting new
information from other departments and you realize, oh, I have a lot to learn from
X, Y, or Z department. Let me bring that into my work. Without them, our work
would be extremely hard since we may need more energy and time to just get
clear about how government runs, let alone to innovate” (Seattle IP staff, June 23,
2021).

In the example of the affordability program, the collaboration with four city agencies brought
in professional expertise that helped to streamline the application process and to clarify different
eligibility and income requirements for application. The Seattle IP managed to map the journey
of the affordability program application to identify where could be changed to mitigate the need for paper files, guest accounts, or client log-in credentials. The service roadmap integrated insights from all agencies and ensured that information on the affordability portal conveyed correctly the services that those departments offer the community. Interviewees mentioned that involving those agencies helped the lab to learn details about a lot of programs that were overwhelming, even for professionals with experience and skills. Those subject matter expertise allowed the lab to understand the most complex programs and discover new changes to offer affordability programs.

Second, in addition to increasing knowledge, collaboration with city agencies further helped to build innovation capacity by adding human and financial resources to the Seattle IP. This was critical to a small unit like the Seattle IP since its funding for innovation projects are supported by other city agencies’ own budget. Those resources complemented the Seattle IP’s own resources to increase its innovation capacity for public sector innovation. For example, the Seattle IP collaborated with the Department of Neighborhoods, Finance & Administrative Services, Office of Immigrant & Refugee Affairs, and Office of Labor Standards in a project called TNC Driver Outreach\textsuperscript{11}. In this project, all departments shared a budget, and the Department of Neighborhoods offered staff to help develop survey questionnaires and code data from over 1500 responses. One Seattle IP staff said, “in the TNC project, the IP didn't have enough money to provide incentives, but the other departments were like, hey, we have a pot to pull from. We'll go ahead and pay for that. I also had non-researchers go in and help me code

\textsuperscript{11} This project aims to connect with the Transportation Network Companies (TNC) Driver community to understand drivers’ perspectives on their values, motivations, needs, and challenges so that the city of Seattle could improve their working conditions such as low pay rates, a lack of transparency, and constantly changing job requirements.
data. It really helped out to collect data and learn from data” (Seattle IP staff, September 30, 2021).

Positioning in the mayor’s office and having a networking leader were perceived important to enable the Seattle IP’s collaboration with other city agencies. As stated in section 1.2, the lab had a broad reach to different scopes and functions in the city agencies, as the mayor’s office connected with other city agencies. Interviewees also mentioned that when it could be very hard for two departments to collaborate with each other, the Seattle IP coming from the mayor’s office was regarded as a sign of a top-down mandate to enforce the collaboration. One city agency staff explain, “they do carry the stick, call the mayor’s office with them. I mean, they not going to necessarily use it, but they do come with a mandate that comes from the mayor's office while it may never be said, there is that subtle reminder that if things aren't going well and the deputy mayor hears about it” (City agency staff, October 12, 2021). Yet, coming from the mayor’s office may also cause some political concerns that the Seattle IP may get caught up with public relation problems with other city agencies. The lab leader, therefore, played a key role in further aligning with the mayor’s office and other city agencies to build internal collaboration.

**Collaboration with external partners.** Interviews with the Seattle IP staff showed that collaboration with external actors, like intra-organizational collaboration, was another important determinant to build innovation capacity in the Seattle IP. Since the Seattle IP was a small organization, interviewees mentioned that it was important to leverage external partners as key sources of additional knowledge, insights, and expertise in other fields of professions they were not familiar with to build their own innovation capacity. According to interviews, collaboration with technology companies helped to build innovation capacity by leveraging their technological resources and expertise to inform new solutions with IT while involving citizens in the
exploration stage of innovation bringing in their life experiences to inform new changes in the city government.

First, according to interviews and collected information, collaboration with technology companies in Seattle was key to innovation capacity in the Seattle IP. In 2018, the Seattle IP established the Innovation Advisory Council (IAC)\(^{12}\) to involve six technology companies: Microsoft, Twitter, F5, Tableau, Google, and Amazon. The list of partners expanded in the past three years (Appendix D4 showed a list of projects those external partners were involved in). Because of the large number of technology companies in Seattle, the Seattle IP can easily find external partners who are interested in the development of technological innovation in the city government.

Collaborating with those technology companies increased the Seattle IP’s access to a variety of technological tools and expertise and thus, increased its use of information technology that can be further leveraged to increase innovation capacity, as is stated in section 1.1. In the example of CiviForm, Google.org donated 22 full-time staff voluntarily to work with the Seattle IP to explore and actualize the online tool to support the affordability program application. This enabled the Seattle IP to have more human resources to build the tool more quickly. Their technological skills and expertise helped to increase the Seattle IP’s expertise and resources to better design the prototypes for specific new public services.

However, such collaboration with technology companies did not seem to be sustained due to the lack of a shared understanding and commitment which discontinued the exchange of technological expertise and human resources after the exploration of new ideas. Although the

\(^{12}\) The Innovation Advisory Council (IAC) was launched on August 2, 2018, by way of an Executive Order signed by Mayor Durkan. It includes a range of our region’s most innovative companies committed to sharing insights and expertise with the City as the City develops data-driven technological approaches to addressing our priority areas of homelessness, affordability, mobility, and delivery of basic services. [https://www.seattle.gov/innovation-advisory-council/about](https://www.seattle.gov/innovation-advisory-council/about)
IAC members had a broad interest to help the city government innovate, there was a lack of a clearly defined purpose and goal in specific projects that drove technology companies to be committed to those innovation projects. Interviews with external partners mentioned that the statement of goals in the IAC was not specific enough for them to clearly understand their roles or responsibilities in the innovation project and to provide technological resources that were useful for the next steps in technological innovation. They may not prioritize the innovation projects as some of them did not fit their interests and strengths.

“I think what was really interesting and probably a big detriment was that it was so open. It seemed to include the technology companies to do those best practice sharing, but what is the purpose of this? How can our services or products really help solve specific problems? We weren’t really using our core competencies at all to really help with what city government needs to innovate” (External partner, December 13, 2021).

In an example of earthquake early warning and earthquake damage assessment project, it aimed to improve the city government’s process for assessing damage after a major incident, such as an earthquake. The project started with an exploratory search for effective technology for detecting earthquakes and providing warnings in advance. While it ended up with primary recommendations, it did not narrow down to specific problems that the city government would like to solve. It was, therefore, not clear to partners what the project wants to achieve eventually and how they could help with their own expertise. One external partner said, “we did get to some good outcomes like the primary recommendations. But what’s next? And it became unclear to us. What are we going to build? Is there funding for that or not? It was really interesting to see everyone come together and there were still a lot of questions about what we want to achieve. I
don’t think anybody really felt like they owned it, or we could actually make it successful. There is no specific problem statement that says what you want to solve and then what are acceptable constraints and trade-offs. Eventually, it was just project papers, not actual innovation” (External partner, December 8, 2021).

In contrast to collaboration with technology companies, involving citizens was a key determinant of innovation capacity in the Seattle IP. It helped to increase new knowledge and insights for innovation capacity by providing citizens’ live experiences and feedback. According to interviews, as citizens were the ultimate target for innovative solutions, their perspective indicated how the city government could better serve them and informs those new changes it needed to make. Their experiences and inputs helped the lab to discover what have been missing before in the government practices. Their alternative perspectives broke the bias in the city government and re-ordered priorities that matter most to citizens’ needs. In this sense, learning about citizens’ live experiences during the early stage of innovation allowed the lab staff to discover new knowledge about where public services or policies needed new changes. It increased lab’s knowledge and allowed it to generate more new proposals. This was explained by one lab staff in the following quote.

“Involving citizens is big in the city government. We want to make sure that we bring in community members because we are trying to unpack what's happening. To talk to people who are affected residents can be extremely helpful in terms of interpreting what's going on since they are at stake and have direct experiences about what can be done to make it better, which is ultimately what we're trying to do. So, we can have more perspectives to make a great complement to performance management. Usually, staff sit in an office in downtown and don’t
know what’s going on in their area. And you could look at reports at your desk, and do not know what they actually mean to citizens and what to do in the future”

(Seattle IP staff, December 2, 2021).

In the example of TNC Driver Outreach, the Seattle IP collaborated with the Department of Neighborhoods to connect with the driver community of about 40,000 through a variety of methods including one-on-one driver intercept interviews, roundtable discussions, focus groups, a telephone town hall, and an online survey. According to interviews, the collected information revealed top concerns among those drivers, including no protection of employment, unfair customer complaints, high competition, and lack of minimum wage, among others. It challenged commonly held assumptions that drivers clock hours are very flexible. In fact, half are driving more than 32 hours a week, and those hours are practically dictated by times of the day when they can earn more money. It also revealed different needs and challenges between full-time and part-time drivers. This new discovery re-ordered priorities of policy making in the Fare Share legislation related to worker protections. It reshaped the minimum compensation threshold to the full-time drivers and part-time driers. On September 29th, 2020, City Council unanimously passed legislation making Seattle the second City in the country to guarantee a minimum compensation to TNC drivers.

In the citizen involvement, interviews with the Seattle and city agency staff showed that it was important to engage with a diverse range of population and to treat all citizens equally, especially historically marginalized community groups. This helped to build innovation capacity by better understanding the diverse interests of all stakeholders who were potentially affected by new ideas. This was evident in the TNC drivers’ outreach. One city agency staff said, “such engagement really helped us to understand those competing interests and what they really need
among different groups because the driver community is not a uniform group. Those are really sometimes contradicting opinions, but as a lawmaker, you cannot favor one over another. When we make changes to the regulations, we need to make sure that we don't indirectly or potentially hurt a lot of drivers. I think involving drivers is really valuable in this point to consider those things and to ensure we do not miss important points that might cause harm to some community groups” (City agency staff, October 12, 2021).

**Network Governance.** The lack of sufficient relationship management with external technology companies seemed to limit innovation capacity in the Seattle IP. According to interviews, while the IAC sparked interest and motivation at the beginning, the follow-through and routine updates were limited to maintain the momentum and commitment to devote resources and knowledge after exploration of new ideas. This further led to the lack of a shared understanding and commitment in the collaboration to support the implementation of innovation outputs. External partners mentioned that there was limited discussion about pipelines of the innovation process with clear scope, success criteria, resources, and constraints among them. They often felt disconnected and disengaged after the exploration stage since it was not clear who are the experts steering the problems and who are sponsors, champions, or project owners from within the city to continue leading, managing the partnership, and funding the innovation projects. One external partner described the situation in the following quote.

“We felt lost after a round-table discussion with the leading people in the city departments. I think we were a group of good-willed participants for a while, but eventually, we needed to make progress on something. But it always felt like we were just missing somebody that was going to be the authoritative decision-maker. The person that outlines the particular problem space, steering the pipeline. Then
you can have a pool of resources for different functions that might rotate in and out. you can have us help you make the change and manage the change. Instead, we felt a little bit disengaged cause they did not start off with a clear way of how they are going to manage the project and to manage the partnership. As most of us were volunteers, we were even less committed if you were unclear what should be spending our time doing this right now” (External partner, December 8, 2021).

Other external partners complained that they were not able to use their own core competencies to increase innovation capacity due to the lack of knowledge about the purpose of the innovation projects at the beginning. In the example of building an affordability portal, one external partner said, “we were under the impression that we'd have a little bit more of an understanding early on as to what projects would meet our core competencies at [Company A]. But, that really wasn't the case. We were assigned to a project that [Company B] and [Company C] were also all a part of. And what ended up happening is these two companies brought on some designers to do that. And they got what they were good at since the website element design was probably the least complex of our project specifically. But, I think what the bummer ended up being is that for us we weren't really using our core competencies at all. We were interviewing city departments, trying to understand their processes. If it was structured from the very beginning, we may find another project that fits our competencies more to really make it happen. Or we can find the part in this project that we are really good at. Instead, it was just asking technology companies this and that. It was not really well aligned to make the change into the area” (External partner, December 13, 2021).

1.4 Knowledge and learning
**Knowledge absorption.** Eleven out of 14 interviewees stressed that absorbing new knowledge from outside the lab was perceived as important to innovation capacity in the Seattle IP. According to interviews, knowledge was one of the most important determinants to increase innovation capacity. Acquiring and assimilating new knowledge enabled the Seattle IP to increase their knowledge base to identify new changes or ideas, thus adding to its innovation capacity. The lab’s potential absorptive capacity was facilitated by its dedicated team of multidisciplinary staff and by its internal connection with other city agencies. One city agency staff said, “I think from my perspective, the Seattle IP brought all of the different parts in a particular issue together. They have the know-how and the background, and so they are the team that after working with the whole group to be able to bring all these considerations together. In a side project about returning to work, the team worked with different state departments and learned about the return to work, surveying employees to see what we want to do with the return to work. And having that data given to us at the operational level helps us make a lot of great decisions based on some really well-founded information” (City agency staff, December 3, 2021).

For knowledge acquisition in the potential absorptive capacity, two mechanisms were perceived as particularly important to acquire new and external information: desk-top research and attending workshops. First, desk-top research work often helped to provide an overview of innovation projects and to identify potential new changes from experiences in other city or local governments. It often involved collecting and analyzing practices of exemplary city governments to address such public or social problems. In the process, a dedicated team of lab staff focused their energy and time to explore new knowledge and insights so that it increased ability to acquire new information. Partners were often involved to enrich the sources of new information.
In the example of COVID-19 testing, the Seattle IP, with the support from U.S. Digital Response, conducted a nationwide review of testing registration software based on early requirements. This reveal showed multiple online tools across the country and one of them emerged as a strong fit in the context of Seattle's COVID-19 Testing Sites. In another example, the Seattle IP commissioned an academic TNC-driver wage study, which was conducted by professors from The New School in New York City and The University of California, Berkeley helped guide the City’s pay standard legislation as well as inform rulemaking and implementation practices for other components of the Fare Share legislation related to worker protections. One Seattle IP staff said, “the research work helped to find different experiences other cities may have. It showed how other places solved similar problems we have and some challenges they went through. Those are valuable lessons we can draw upon to initiate new changes in our city government” (Seattle IP staff, December 2, 2021).

Second, attending workshops organized by universities and philanthropies further enabled the Seattle IP to acquire new innovation methods and other cities’ innovation practices adding to its innovation capacity. As mentioned in section 1.1, the Seattle IP staff attended methods workshops to further learn new tools that enriched their knowledge and expertise for innovation. Interviewees mentioned that those workshops “gave you some very concrete standards of what a good performing organization looks like. It shows specific procedures and criteria to help us look at what we need in project management and how to improve. And I’ve used that to help not only look across the city about where we are in terms of our maturity but then also departments can use that as well to see where they're going” (Seattle IP staff, December 2, 2021).

In addition, those workshops also allowed the Seattle IP to learn from other cities’ best practices, for instance, Louisville, Detroit, New York City, Boston, or Chicago. It helped to
increase innovation capacity by enriching their inspiration and pool of potential ideas that can be applied in the city of Seattle in the future. One Seattle IP staff described the experience in the Harvard Civic Analytics Network to learn new ideas for using data science to improve decision making. “At the convening, we shared our perspectives on the priorities, successes, and challenges in our own organizations. We took inspiration from how Louisville is spearheading an open-source Waze preprocessing project, Allegheny County is integrating data analytics into their Human Services Department and New Orleans continues to bring data to the challenge of police recruitment and retention. We sought guidance from those who had faced similar challenges, both technical and organizational. Insights from the group on the best way to prioritize and filter data science projects for this diverse group of potential clients I have already used in the City to streamline our approach in IP” (Seattle IP, 2018).

For knowledge assimilation in the potential absorptive capacity, interviews showed that the Seattle IP has built a process to digest new knowledge and feedback into the innovation process. Such updates in the knowledge base then further helped to identify new changes needed in the city government. New knowledge and insights were being discussed and digested and made sense by the staff in the Seattle IP and the city agencies. New lessons learnt from other cities were adapted to the context of Seattle and helped to increase the pool of potential ideas that led to innovative solutions. In the example of TNC Driver Outreach, the Seattle IP team synthesized new insights into a coherent framework that makes sense of all the contradictory opinions and helps decision-makers better understand competing interests. It evaluated and adjusted existing understanding and knowledge of drivers’ needs and government legislation. This further helped to convince those decision makers to support pay standard legislation and to apply them to new the Fare Share legislation related to worker protections.
“For the research support process to be able to identify those really contradicting sometimes opinions, even within the same driver community. So our job is to put all that together into a coherent and easy-to-understand report for decision-makers. So how do you take that into account after the research, after the engagement, and how do you work with decision-makers to make sure they understand those competing interests. They would put all these things on the table and they had to work to figure out how to actually be sent all of those in a way that makes sense for if not all, hopefully, most drivers. So, I think they did that successfully.” (City agency staff, October 12, 2021).

However, interviews did not show evidence that realized absorptive capacity, knowledge transformation and application, was important to determine innovation capacity in the Seattle IP. According to interviews, the Seattle IP acted as an internal consultant to the other city agencies to initiate and propose new ideas or recommendations. The knowledge transformation and application process were required in the specific city agencies that were responsible to take up those new ideas and implement alternative solutions in the long term. Interviewees mentioned that in the Seattle IP, the lab staff focused more energy on exploring new changes in the city government and proposed investment (e.g., funding, staff, technologies, etc.) to implement innovative solutions. The city agencies still need to learn expertise and skills to transform the new knowledge into fully developed innovation outputs. The actual translation of innovative ideas to innovation outputs still takes capacity focusing on managing changes in the implementation of innovative solutions.

In the example of FireSTAT, though the Seattle IP managed to propose new data warehouse for the Fire Department, it still required the staff within the Fire Department to have
technological skills so that they can maintain the data warehouse. The Seattle IP built up a platform to help provide data in a more digestible and accessible format for decision-making model in real-time. It utilized new database and data visualization techniques that the Fire Departments were not familiar with. It requires transformation in the technological tools and skills to further implement and maintain the data warehouse. One city agency staff said, “I do a lot of data reporting for various internal and external stakeholders. And so, I became sort of a subject matter expert in that system. So, you need a more IT-driven person to take over this in the long term. You have to take some classes in Tableau where to basically help you get up to speed and be ready to do this job. The Seattle IP was good at such a point where you need to transit the data platform for long-term maintenance. You need a person to put the new things back to the government routines” (City agency staff, November 8, 2021).

**Knowledge sharing.** Interviews with the Seattle IP staff showed that knowledge sharing among the team members was an important determinant of its innovation capacity. It helped to build innovation capacity by keeping alive knowledge learnt by individual staff and by leveraging each staff’s unique skillsets. Both knowledge collection and knowledge donation were found useful for knowledge sharing so that the staff had more knowledge or expertise to better manage innovation projects. Interviewees mentioned that such knowledge sharing was necessary for conducting innovation projects given that an individual staff’s skills and expertise may not solve all the challenges or obstacles that need to be overcome to create innovative solutions. Sharing knowledge among the lab staff allowed to learn from each other’s strengths so that the Seattle IP managed to navigate the innovation process and manage changes in the innovative solutions. Eventually, such shared knowledge becomes a template for innovation project management that can be further applied to future projects.
“We often share what we learn from the projects and what we might have heard from other sources with each other. Just being able to not do one-off projects, but to find and identify projects where our expertise can almost have a template that we can apply to other programs or departments. We can build our fundamental knowledge to help with future projects but also spread it elsewhere in the city government” (Seattle IP staff, October 12, 2021).

For knowledge collection, the Seattle IP staff developed documentation to record each innovation project, sharing lessons or insights learnt from the innovation process. Those documents were shared among staff in the Seattle IP as well as shared with internal agencies working together on the innovation projects. According to interviews, it helped the team members to learn barriers or challenges in the process and techniques to better manage or overcome them. By collecting knowledge acquired by individual staff, the Seattle IP managed to increase its knowledge base to enhance innovation capacity. Outside the lab, interviews mentioned that such knowledge collection was very rare and that city staff often committed similar mistakes in conducting projects, which led to a waste of resources and an increase of risks to innovation.

“I see a lot of departments doing similar projects, but often making a lot of same mistakes between different programs or different departments over time. They went into the same problem because they don't talk to one another. And having an IP office to meet is useful to think about how you document all that. So that we're not wasting resources repeating a lot of the same mistakes. Because that's wasteful, that's not effective and time-consuming for each department, each program to learn the same mistake” (City agency staff, October 12, 2021).
For knowledge donation, according to interviews, the Seattle IP staff helped each other in the generation of new ideas or make of initial designs, when they were asked for. The lab developed a routine project sharing to donate their expertise that helped others better tackle challenges or obstacles in the innovation projects. This donation managed to leverage an individual’s expertise and skills better in the exploration of new ideas and management of innovation projects, and thus added to innovation capacity.

“We do a regular project share-out. As we're working through different projects, there's space on a regular basis where we will share out what are we doing, what have we learned, what are the challenges we've had to deal with on this project. We benefit from that because it will get the whole team kind of can lean in and give some suggestions or ideas on how to overcome some of those challenges. we had the benefit of all sitting in a very open office space. It was very natural to be able to wander over to someone's desk to say, Hey, you know, could you, do you have a few minutes? Can we talk I'm struggling with this? Can we talk through it? It's a little harder to do that now, but we're making do” (Seattle IP staff, August 12, 2021).

**Learning orientation.** According to interviews, learning orientation in the Seattle IP was key to innovation capacity by continuously increasing its knowledge base to support public sector innovation. This learning orientation was reflected in the Seattle IP’s creative human resources, ideation procedure, and organizational culture of excellence, creativity, and openness. Interviewees mentioned that such openness in learning was necessary for the lab given that those projects often needed various domains of knowledge or different professional skills to identify and manage new changes in the existing city government practices and because old knowledge
needed upgrading to generate out-of-box thinking. In the rest of the city government, one city agency staff said, “it's often hard to do that learning because you’re always onto the next task. The pace of the work is so frenetic that you don’t really want to reflect on yourself and learn. That’s hard to pause. But it’s critical to pause and reflect and learn, if you really want to change and improve” (City agency staff, October 1, 2021).

In the example of COVID-19 testing, normalizing and scaling testing was critical to prevent the spread of the virus. Despite several partners benched space to accommodate a high volume of community testing, those testing sites, volunteers, medical staff, and citizens needed to be further accommodated to a large scale of testing. It was, therefore, necessary to learn every part of the testing process before tailoring them around the needs of the people going to get tested. In collaboration with public and private partners, the Seattle IP managed to understand the experience of testing, learn the qualifications of samplers, to find possible testing locations that ensure access equity. Eventually, it doubled the city’s testing capacity in two weeks, bringing online last month two new locations that can each test 700 people a day, six days a week. The importance of learning orientation was explained by one city agency staff.

“Dealing with the COVID is unprecedented. It was also under much pressure. So [the Seattle IP staff] was a key figure. From the beginning, we had many fire agencies, and public health employees, coming to understand how we can move testing to a scale that is really enough for community testing. A lot of [the Seattle IP staff]’s work was in really ironing out the kinks that we were having and making this as fast of a registration process as possible, putting it on a digital platform. She had to come in and understand the actual sample acquisition process so that she can figure out how to best support that and the workflow for
the site for people like us who were much more involved in the operations. Both [the Seattle IP staff] and her team really helped to think outside of the box for how we could create a digital solution and think about it differently” (City agency staff, December 3, 2021).

In addition, commitment to learning was also key to acquiring new skills and expertise to enhance their knowledge base and further their innovation capacity. This desire to learn enabled Seattle IP staff to add more insights or resources and learn more techniques to support public sector innovation.

“So we're also very fortunate that we, as a team, have a natural curiosity. We want to learn how these things work in the government and the city of Seattle government. And how does all of this occur? So that the combination of coming in or coming into a project from a point of humility, a starting point of humility, we're here to learn and help” (Seattle IP staff, August 12, 2021).

2. Summary on the Seattle IP

In a short summary, the findings first showed key determinants in the four dimensions: resources, management, collaboration, and knowledge that influenced innovation capacity in the Seattle IP. According to interviews and collected information, the Seattle IP’s resources, a dedicated team of staff with diverse backgrounds, and a high level of expertise for innovation, in particular, were key to building innovation capacity. A dedicated multidisciplinary team of staff enabled the lab to acquire new knowledge, insights, or technological tools to generate new IT-enabled solutions. In addition, the use of information technology helped to introduce new changes in the public service and digital transformation in the city government.
In addition to resources, the ability to use those resources for innovation was also key to innovation capacity in the lab. The lab leader played key roles in developing innovation strategy, aligning with the mayor’s office, protecting lab staff from critiques, nurturing innovative and risk-taking culture, and connecting internal city agencies that established the legitimacy of the Seattle IP to use resources for innovation. The lab leader’s protection cultivated the innovative and risk-taking culture in the lab that further increased the lab staff’s motivation to initiate new ideas and innovation projects. Leaders also played a key role in increasing connection with internal partners and aligning with city government priorities so that the lab managed to increase both knowledge and resources for innovation from internal agencies.

Collaboration with technology companies enabled the Seattle IP to increase technological expertise and tools to enhance its innovation capacity. Yet, the insufficient network governance led to a lack of close and wide partnerships with external actors that limited the ability to leverage partners’ resources and knowledge after the exploration. Its knowledge absorption and sharing ability, focusing on bringing external new knowledge, allowed it to filter newly learnt knowledge, adjust the existing knowledge base, and then propose new changes or ideas to develop public sector innovation. Eventually, the new knowledge acquired and assimilated in the lab increased its innovation capacity to propose new changes and alternative solutions in the city government.
CHAPTER SIX

THE MINNEAPOLIS OFFICE OF PERFORMANCE AND INNOVATION (THE OPI)

The Minneapolis Office of Performance and Innovation was established in 2015. It served as an internal consultancy to the city government of Minneapolis. The main sources of funding have been the city government’s general budget for its lab staff and Bloomberg funding for innovation projects. It is regarded as a unit that helps the city government to find new solutions to public or social problems and to improve government operations to better serve the public. Currently, the OPI is a team of six members located in the City Coordinator’s Office.

Working across various policy areas, the OPI conducted innovation projects from simple projects such as improving internal processes within a department to big projects that involve stakeholders inside and outside the city\textsuperscript{13}. According to the collected information, the two major innovation projects initiated by the OPI were Performance Management Metrics and Reporting and Unarmed Public Safety Responses. The first project developed new performance metrics for each city agency which were ready to implement in 2023. The second project created a behavioral crisis response team that launched in December 2021.

Interviewees mentioned that the OPI enabled the city agencies to think creatively, explore thoroughly the problems they want to solve, and learn from the failure of innovative solutions without being criticized. One OPI staff said, “we serve as an internal consultancy, like most of the innovation teams that grew out of the Bloomberg initiative back in 2015. We do a variety of innovation projects, which could be anything from solving something as simple as a process within a department and working with the staff to do that to something as large as many stakeholders inside and outside the city, which could be residents, community organizations,

\textsuperscript{13} For the full list of innovation project in the OPI, please visit: https://www.innovateminneapolis.com/who-we-are
service organizations. We finally built ourselves into that place where policymakers, department heads, staff, and the community can come to us and say, we think this is the issue. Can we go through your process to figure out if that's really what the issue is? And then how do we solve for it?” (OPI staff, November 23, 2021).

1. Determinants of innovation capacity in the OPI

Interviews and documents highlighted key determinants of innovation capacity in the Seattle IP in the four dimensions: resources, management, collaboration, and knowledge. In the OPI, it was important to have a dedicated team with a high level of diverse professional skillsets, small but flexible sources of funding for innovation, a dedicated leader, an idea generation process and innovative vision and culture, as well as knowledge absorption and sharing within the lab to build innovation capacity. Connection with multiple internal city agencies helped to increase resources and knowledge that are essential to further build innovation capacity. However, the lack of a close and wide partnership with external actors and the lack of legitimacy seemed to limit the OPI’s innovation capacity to support more innovation projects.

1.1 Resources

**Human resources.** All ten interviews with the OPI, city agency staff, and external partners showed that a dedicated team of staff oriented toward innovation was a key determinant of innovation capacity in the OPI. It helped to build innovation capacity by focusing the lab staff’s time on exploring new ideas and pursuing innovative solutions. Because the OPI staff’s sole responsibility was the development of new solutions, according to interviews, they had the freedom to think differently about new changes in the city government, without constraints of day-to-day tasks like other city agencies. It also allowed the lab staff to be free from traditional bureaucratic thoughts that limit the generation of out-of-box thinking to create innovative
solutions. Compared to the other city agencies, the OPI staff had time to explore alternative practices in other city governments and new knowledge that were not thought about before to drive new ideas or solutions. This was explained by one city agency staff.

“I think their capacity in innovation comes from the people power necessary to do this innovation work, which may be over and above other staff's scope of duties or just the time they have available. In other agencies, people are just working around the schedule and routines. They may not have the luxury or the freedom to think what other possibilities are. The OPI is different. The people there is incredible. They often bring to the table what is new in violence prevention and what tools we can use to do new things” (City agency staff, January 7, 2022).

In the example of performance management, a dedicated team focusing on innovation was also key to increase innovation capacity to speed up the ideation process. One city agency staff said “I think, in that case, we were moving on a path toward that work with the investment of one staff person. But we were moving on that path relatively slowly and OPI’s involvement really gave us the boost that we needed to get there much more quickly and the boosts that we needed to get there in a way that was deeper and more robust ideas about how to improve the performance reporting. They helped us to think about what are most important in our criteria and what is missing in our performance reporting, whether the metrics are meaningful to the real service delivery. We thought about those before, but not systematically until the involvement of the OPI” (City agency staff, December 21, 2021).

Second, a high level of educational background was another key determinant of innovation capacity in the OPI. It enhanced innovation capacity by increasing the necessary expertise and skills to navigate the innovation process. Figure 6.1-6.3 showed that most of the staff members in
the OPI had a master’s level of education, and they had a professional experience in the public and non-profit sector. Such a high level of educational background indicated that the lab staff acquired a high level of project management skills and expertise (from fact-finding to idea generation) as well as new methods or tools (e.g., human-centered design). According to interviews, such skills and expertise allowed the OPI to navigate the ideation of innovation projects, linking the abstract visions with the concrete ideas of innovation. The staff managed to discover core issues in public problems, to integrate insights from multiple stakeholders, and to track the project progress step by step for achieving new proposals and ideas.

Figure 6.1 Highest degree achieved by staff

Figure 6.2 Major achieved by staff

Figure 6.3 Professional experience prior to OPI
In the example of performance management reporting\(^{14}\), the combination of skills and expertise in human-centered design and information management was critical to identifying key performance metrics and re-design reporting processes to inform decision-making based on organizational performance. One city agency staff said, “I think they’ve come into a nice blend of technical skills. I see they have these two staff with one design and one information management background. So the blend let them have all the expertise needed to do innovation. In the performance reporting project, one was very helpful to let us understand what we are reporting and what performance measures we really needed, or what measures were not clear and needed improvement. Then, another one staff was compiling the information we could find to measure the metrics. By combining both, we built an index with a clear description for each item for city performance. In the process, the two members of the OPI tracked each change made in the metrics. This made it clearer why we want to measure them, what to prioritize, which indicator to look at, how this indicator could inform our decisions.” (City agency staff, January 7, 2022).

Third, a combination of professional experience in both the public and the non-profit sector was also important to innovation capacity in the OPI. This combination helped to enhance innovation capacity by increasing knowledge absorption to acquire new knowledge and information from different sectors. According to interviews, staff with experiences outside the public sector brought additional perspectives to understand public or social problems and to propose alternative solutions. Their expertise helped to acquire new knowledge and to broaden the mindset and knowledge in the lab by bringing in alternative practices from non-profit sectors. It increased knowledge in the lab to inform new ideas in the city government. One OPI staff said,

\(^{14}\) This is a project that aims to improve City services by identifying where the City wants to go, how to get there, and if the City's goals have been achieved through data-driven analysis. This work is accomplished through strategic planning, reporting on progress, and data analysis.
“I try to get people from other places [sectors] because unfortunately in a lot of cases, most government people think like government people and in order to get government people to think another way, it gets important that people spend some time in government and walk away and come back because they at least understand how government people think. It can help them to get out of it, to get people who have a broad range of experience, mostly with systems change. They can then bring in their other experience outside the government to renew what is going on inside the government. Otherwise, people cannot really jump out of what they were used to doing and think differently” (OPI staff, November 23, 2021).

Finally, training became an important determinant to build innovation capacity in the OPI. Interviews with the OPI staff showed that the lab provided financial resources to train their staff. In working with the Bloomberg philanthropy and other nonprofits, the staff was able to attend training sessions for data analytics, as well as management tools for innovation projects (e.g., idea generation, prototyping, evaluation, etc.). It increased staff’s skills in managing innovation activities and using new methods and skills to generate new ideas, and thus helped to build innovation capacity. One OPI staff said, “So personally, I really credit the ability to actually run a trial because we had direct training from the Behavioral Insight Team, which is a part of the Bloomberg family organizations. This gives us training in order to do that. We were also part of the What Works City certification process starting in 2019. We were receiving technical assistance from these amazing people. That almost really felt like a graduate-level course and evaluation. For a number of years, that funding really allowed us to do training, to go to conferences, to really build our professional development opportunities that are unique” (OPI staff, December 6, 2021).
In spite of a dedicated team of staff with expertise in innovation, the small size of the team limited the innovation capacity in the OPI. All interviewees in the OPI mentioned that the lab did not have enough human resources to take upon the increasing demands for innovation in the city government. One OPI staff said, “we can only do so much and I try to get my staff to have skills trained so that they can offer to the city. But I can’t duplicate people” (November 23, 2021). Because of the high workload, the wellness of the staff was negatively affected and thus reduced the staff’s ability to follow through with innovation projects in the long run. “The innovation work was demanding and the OPI staff need rest so that they were able to think creatively and reflectively”, said one OPI staff (December 6, 2021).

**Financial resources.** Interviews with the OPI staff showed that the smallness of funding for innovation projects is one of the key determinants of innovation capacity in the OPI. They mentioned that a small amount of funding for each projects helped to build innovation capacity by granting the flexibility of using the funding to explore new ideas. A small amount of funding was also feasible in the early stage of innovation projects since most of the innovation projects did not require large amounts of budget to initiate. This smallness of funding for each innovation project allowed the OPI to avoid political ramification that was preventative for innovation to happen in the past. It enabled OPI to run innovation projects in the grey areas that were not tested and that would raise critique if failed.

“In most cases, it doesn’t take some large budget to start some projects. We can usually find money in savings where people have some money left. That money actually allowed us to try something new and different besides what the general budget says what we need to do. It avoids the long debate on why we are spending
the money on the test or experimentation because those are savings due to people are under budget or there's a staffing shortage” (OPI staff, November 23, 2021).

In spite of the usefulness of small funding to enable initiation of new ideas and innovation projects, innovation outputs still needed a larger amount of stable financial resources for implementation on a wider scale in other city agencies. According to interviews, the initiation of innovation projects often did not require much funding but the lab staff’s time and energy to explore new ideas. The new ideas or proposals could further result in another round of financial investment from the city agencies responsible for implementation. If the initial ideas turn into a new service program, the lab helped city agencies to estimate financial investment to fund extra staff or private vendor for new service delivery. This was explained by the following quote.

“What we initiate or work on may end up being a new program, a new initiative or something for another department. Our work may only need the staff time to explore, but for another department, this is going to be another million dollars for this department or something per year. Then what we do is we bake that into our models so that when we're getting close to pilots or implementation or anything like that, that we're communicating that information to the budget department, along with that the department head, the budget office and politicians so that they can either make a decision about whether they want to pilot something, or if they want to give it all gone funding for the life of however long they think initiative needs to run. If the new idea comes into a big deal, through that we bake it into our model to let people know it's coming” (OPI staff, November 23, 2021).

Information technology. Interviews with the OPI staff showed that the use of information technology did not seem to be a key determinant of innovation capacity in the OPI. Most of the
innovation projects conducted by the OPI did not involve the use of information technology. The only exception was an interactive web portal for small businesses to reduce the amount of time that they needed to prepare paper documents for subsidy applications. The lack of use of information technology in innovation projects was explained by its principle that innovation is aims to solve public problems in the city of Minneapolis, especially social equity issues in the city. One OPI staff explained, “we do not necessarily use information technology in our new solutions or proposals. The main reason is that we focus on equity issues in the city, and we don’t think the technology is a suitable solution. Sometimes IT can help people to find services or resources they need. Sometimes IT can discriminate against those people with technologies even more. We take equity as the top one concern. Through that lens, we may evaluate whether we want to use IT in our proposals or not” (OPI staff, December 6, 2021).

Instead of information technology, the use of the data was important to the OPI’s innovation capacity. The interviews showed that the OPI staff had strong data analytical skills that helped to find out trends in the government performance and to inform core issues in the government practices. The lab staff further reflected upon the performance trends and to discuss reasons behind those trends to explore why specific issues in public management are happening. It enabled the lab to acquire new knowledge about government practices and the root cause of public problems so that they increase innovation capacity to inform new changes in the city government for better public services or policies. According to the following quote, data analysis acted as a starting point to explore the reasons behind and discover alternative solutions to improve performance.

“Because we knew if we want to make a data-informed decision about policy for these public safety works, we need to start at the beginning with what the current
state is. And so that’s a typical first step is that we need to know how we even measure this. Most time we can work directly with the data people in the department. Sometimes we need to get some help to build data systems or put together some visuals or give access to things. Then we have quantitative skills to be able to dig into a complicated administrative dataset and produce meaningful visualizations to learn, to reflect, and to innovate. It is cool to have all the data together. Then we have all the relevant people in the department, not only the data people, but field workers, head of department, you name it, to find what needs to improve, how we might improve it, what seems the top priority to change” (OPI staff, December 6, 2021).

1.2 Management

Leadership. All interviews with the OPI and city agency staff showed that the lab leader who was committed to promoting public sector innovation was a key determinant of innovation capacity in the OPI. The leader helped to build innovation capacity by managing innovation projects, offering protection for the lab staff, and networking with partners for additional resources.

First, the lab leader increase innovation capacity by helping to manage innovation projects and navigating through internal processes. Interviewees mentioned that the leader was perceived as a policy entrepreneur who was capable of bringing new changes and innovative solutions to public problems. The leader’s own expertise and knowledge in managing innovation projects helped to increase the lab staff’s knowledge and skills so that innovation capacity in increased to better generate new ideas and proposals. When the innovation projects encountered challenges, he became the key person with his experience in project management and city government
internal dynamics to help lab staff solve those obstacles and manage changes in the city agencies. One city agency staff said, “It won’t be possible without him that non-police community response could happen, because you got so many changes to consider and so many insiders and outsiders to take into account. I think [the OPI leader] has shown he’s capable of pushing things, managing things, working across the enterprise, working with the elected. He brings that level of expertise to be able to do the research, do the analysis, develop the program, and bring all those pieces together. He is experienced in connecting dots between the government and the community to find the right people to talk to and convince them to take the ideas” (City agency staff, January 7, 2022).

Second, the lab leader helped to build innovation capacity by offering protection for the OPI staff from being unfairly criticized for mistakes or failure. The leader offered protection through advocating the legitimacy of innovation methods (e.g., evidence-based or human-centered design) used by the lab for better understanding of public or social problems. According to interviews, this protection increased lab staff’s motivation to pursue innovative solutions. The OPI staff felt encouraged to utilize those innovation methods to take certain risks of exploring new solutions that have not been thought of before. They were able to take the pressure from the city agencies and challenge the traditional bureaucratic management, avoiding being compromised by other city agencies’ traditional logic or biases that often discourage city agency staff from being creative. One city agency staff provided an example to show the lab’s leader’s protection to support innovative ideas.

“One example I can think of is that with innovation work, policymakers often have a desire to move things along really quickly to the direction they want. For instance, six or eight months ago, a council member came to them and said, I’d
like to direct you to a public meeting to do this, this, and this around the public safety question. And I already have an answer in mind because my constituents shout out that. I want you to provide prove to support my answer. [The OPI leader] pushed back really hard. He said, no, that’s not the right process. If you have a predetermined outcome, that is not innovation, and you find someone else to carry that water for you. Here’s what we can offer you instead for a true alternative in terms of thinking through possibilities and making some recommendations on how to move forward. And that means we have a process, and we need to follow this process and we need to move sometimes, slowly and deliberately. And that may be slower, may more deliberate than you want to see, but if we want this to work and we want it to be sustainable in the long term, that’s how it needs to be done. I think is how it ended up working out to give you the space you need to work that process and come back with new recommendations and next steps, rather than having the pre-set answer be a foregone conclusion because I heard it from my constituent” (City agency staff, January 7, 2022).

Third, interviews with the OPI staff showed that the leader played an important role in networking with people inside the government to build innovation capacity. By connecting with city agency head and staff, the lab leader helped to increase network with people within the city government for additional knowledge to increase innovation capacity. As he sat in the coordinator’s office being a strategic planner. He managed to bring a lot of internal staff with subject matter expertise and outsiders’ experience into the OPI, which added to the lab’s own knowledge to build its innovation capacity. Those insights and knowledge were perceived as
essential to bringing diverse perspectives to identify new changes in the city government. One OPI staff said, “I also know that as [the OPI leader] is a part of a chief of innovation officer community. And then that trickles down for networks. We have actually built relationships with staff through [the OPI leader] being very smart and strategic and friendly and building more rapport with people. And that is a big part I see to have those relationships and be able to be a part of that network for the actual capacity for project success. We are a small team with only five to six members, and we cannot acquire all the knowledge or expertise in the city government or know all the kinks to run government practices. The network allowed us to dig into the government practices and to find those important kinks, knowing them more so that we can help them find new solutions” (OPI staff, December 6, 2021).

Vision and strategy. According to interviews, first, an overall vision toward public sector innovation and a specific innovation strategy focusing on the human-centered design was key to innovation capacity in the OPI. The lab’s mission statement from the official website described the OPI as “an in-house consulting team focused on helping the city address complex and pressing challenges that contribute to racial disparities”. The lab “works side by side with key City staff, residents, and community organizations, to develop new solutions that move the dial toward equity in Minneapolis”. Such an innovation-oriented vision helped to increase innovation capacity by increasing the lab staff’s motivation to explore new solutions to public problems. This also drove the development of an ideation procedure and culture in the lab to better utilize resources for idea exploration, which would be further demonstrated in the sections below.

Further, a specific innovation strategy focusing on human-centered design helped to build innovation capacity by increasing the lab’s credibility to pursue innovation. According to interviews, having a clear innovation strategy around human-centered design created a clear
identity of the OPI to the rest of the city government and clarified its potential value to help city government find alternative solutions to public problems. It provided a certain level of credibility of the OPI so that it is granted by the city councils to utilize its human and financial resources to pursue innovation. This was explained by one of the lab staff, “I think one thing that’s helpful is that our specific focus is around design thinking or human-centered design. I think that we have a really clear vision of the work we can be doing in the city. It is advocated by Bloomberg Philanthropy. So, the approach is a more or less proven tool that could help discover what is really behind the problem we are experiencing and what we could do to improve or what change we want to make. This makes us clear on how we define ourselves and how we want to communicate ourselves to other city staff and externally to residents. This would give us some credit among city councils to show that we are capable of solving problems” (OPI staff, December 3, 2021).

Such a specific innovation strategy was also helpful in the alignment with other city agencies’ visions and strategies to increase innovation capacity in the lab. Interviewees mentioned that the competing political priorities and interests seemed challenging for the OPI to align its strategy with the overall city government. According to interviews, politically, city councils may compete with each other about the public or social problems they would like to solve first. It further blurred the priorities in the city government that the OPI could align innovation strategies with. Despite the difficulties, the OPI managed to align the human-centered design strategy with other priorities of city councils, whatever the priorities were. It enabled the OPI to win support and resources to the OPI’s innovation projects that were substantively different from government routines, which increased the lab’s innovation capacity.
“There’s a political side to all of it, even when you have solutions that make sense. Politically, sometimes it can be a problem and people will get mad because we’re there. Sometimes politicians have their favorite departments. And another politician will say I want you to look in this department. And then the other politicians try to keep us out of it and say I liked this person. I know they may not be performing well, but I liked this person. So we catch the drama because politicians start fighting. So, it’s not always something that we can help with. When you work in a political environment, that happens to our team quite a bit. This makes our focus on human-centered design very important. It gives us a sense of neutral to look at problems without taking political side. It was endorsed by other professionals and there is some credibility with the strategy. It gave them the impression that the OPI was to help, to solve problem, not to blame. And I think it helped to gain their initial support to our work” (OPI staff, November 23, 2021).

Organizational structure and procedure. Interviews with the OPI and city agency staff mentioned that being in the city coordinator’s office did not seem to increase innovation capacity in the OPI. Given the weak mayor-council system in the city government of Minneapolis (before 2022), the city coordinator’s office, as one of the biggest offices in the administrative branch, did not possess a clear decision-making power to take charge of specific government operations. This did not grant the OPI a clear level of legitimacy to pursue public sector innovation. The lack of legitimacy seemed to further limit the OPI’s autonomy to use resources for innovation activities. The lab seemed to be under pressure from city councils to achieve innovation performance and could be questioned by other city agencies if they may fail. It raised the importance of the leadership in the OPI and the human-centered design strategy to fight for its legitimacy in using new methods for doing innovation activities which were essential to building innovation capacity in the lab.
“I think it is a unique office, it’s a heavily administrative role. It’s providing an administrative role in the sense that it oversees these offices that ensure the business of the city. But nobody in the six years that I’ve been there has really taken control in that position. It’s always been a place from where we influence, but we don’t have a charge. I think that it is also the reason why sometimes it’s difficult because we have this legislative form of government where everybody thinks they’re in charge, but nobody’s really in charge. So the leader needs to use his own experience and relationships that I’ve built with these people to be around politics. Otherwise, we may not be allowed to conduct those projects because they always seem risky to other people in the city government” (OPI staff, November 23, 2021).

Instead of its organizational structure, according to interviews, a clear and robust ideation procedure in the OPI was key to its innovation capacity. According to the collected information, the OPI developed a design process, adapted from the Bloomberg innovation model, with six steps from fact-finding to idea generation to program development. It was aligned with the overall innovation strategy in the OPI that focused on the front stage of innovation processes, which was to re-design programs or services, instead of running projects in the long-term. Compared to the rest of the city government, the procedure helped to build innovation capacity by focusing the lab’s working procedure on innovation to speed up the ideation process. Figure 6.4 shows this idea generation procedure in the OPI.
First, the ideation procedure endorsed by Bloomberg Philanthropy and advocated by the lab leader, helped to increase the credibility of the OPI to take risks for other city agencies, adding to its innovation capacity. Second, the ideation procedure helped to build innovation capacity by adding diverse perspectives for new insights and knowledge. Asking open questions to clarify the challenges and causes, interviewees mentioned that such a procedure provided useful guidance to better discover blind spots in those public or social problems and systemically identify core issues through diverse angles. Those new insights helped to break political or administrative bias in the city agency staff’s mindset, which further informed new changes needed in the city government. Third, running small-scale pilots along the innovation process further helped to build innovation capacity by quickly identifying the emerging needs or changing situations to creatively deal with barriers and challenges. It learnt new insights from those testing results to develop more informed proposals and change management for innovation.
In the example of the alternative non-police response to public safety\textsuperscript{15}, the OPI worked with multiple internal agencies, including Minneapolis 311, the police department, and human resources, among others, to discover and design alternative response teams and procedures that provide better behavioral health outcomes for Black, Indigenous and People of Color (BIPOC) communities and all residents. Interviewees mentioned that the human-centered design procedure was used to explore the problems in the police response to crime incidents and to discover how to alleviate the tension between BIPOC communities and the police. The procedure helped to investigate the police response from different perspectives and the core findings changed the framework of community safety. One city agency staff said, “they went through a prolonged human-centered design process to identify some potential alternative responses where police are not responding to certain types of incidents. It really changed the mindset of some city staff and helped to re-imagine community safety framework. One example of this change was to further differentiate incidents that need police response or that do not need the presence of police. The group of population that have a history of mental disorder may require more behavioral healthcare during the crime scene. This turned out to be missing in the police training and may need other professionals to step in” (City agency staff, January 7, 2022).

Along the innovation process, the OPI managed to lay out four pilots that test changes in behavioral health crisis response, 911 dispatch, and training city staff to embed behavioral health professionals in the 911 response to emergency calls. The process outlined the deliverables and key steps to manage those changes in the city government to better design and initiate the

\textsuperscript{15} It is a project to create non-police response teams which will respond to an emergency behavioral health crisis. It aims to improve emergency response in the community due to historically racial discrimination in the police response. On December 13, 2021, the city government launched behavioral crisis response teams that provide an alternative to police for people having a behavioral health crisis, assess needs and provide care and support, and avoid unneeded hospitalization or criminal charge. https://www.minneapolismn.gov/resident-services/public-safety/unarmed-public-safety/
alternative procedure of response to emergency calls. One city agency staff said, “one thing I’ve appreciated about what OPI did for alternative response is that they came with a very specific process. Here’s what we want to get from point A to point Z and here are the deliverables we want to have it was all laid out in worksheets. I think them being so well organized and laying out a process that wasn’t overwhelming, that was step by step and month by month to think and iterate on the process of what we’re trying to achieve. It was more creativity involved, more critical thinking on what we’re trying to do and manage those changes along the way to really achieve it” (City agency staff, December 21, 2021).

Organizational culture. Having an innovation-oriented and citizen-oriented culture was an important determinant of innovation capacity in the OPI. Interviews with the OPI and city agency staff showed that, first, an innovation-oriented culture helped to build innovation capacity by increasing the lab staff’s motivation to explore out-of-box thinking and new ideas. Eight out of ten interviews showed that the OPI was enthusiastic about public sector innovation. It had an open mentality to explore new opportunities that might better address citizens’ needs and social problems. It encouraged the lab staff to be creative, being free from existing practices or constraints in government operations. Compared to the rest of the city government, the OPI staff were more creative and proactive in seeking to change current practices in the city government. It encouraged the lab staff’s motivation to ask hard questions about current public or social issues, challenge existing assumptions in public administration, and explore more new insights for new ideas or solutions.

“They’re really open to some creative ideas and open to trying something that has not really worked and then adjust it and pivot and change it during a couple of months and tweak it along the way. Those habits of [open] mind and ways of
thinking about work in government are often unique. Building those habits of open mind and exercising those mental muscles, I imagine, is part of thinking about building innovation capacity in the OPI to really explore new possibilities beyond traditional bureaucratic thoughts.” (City agency staff, January 7, 2022).

Second, a citizen-orientation culture was another important determinant of innovation capacity in the OPI. Especially, the OPI prioritized the voice of citizens who had historically experienced the least benefit from that service. Such citizen-orientation helped to build innovation capacity by equally including diverse groups of citizens’ needs or feedback to identify new changes needed in the city government. The emphasis on citizen-oriented culture was driven by the huge issue of social or racial inequality issue in Minneapolis. One city agency staff highlighted, “I think that’s a really important part of the OPI philosophy on doing their work is thinking about how a service is serving all users and particularly attending to the needs of users who have experienced the least benefit from that service historically. We as a city are so biased by white supremacy culture and have long been intoxicated by such mindsets to design our government practices. The OPI’s perspectives from citizens and from bottom-up are really a change to those traditions and help to break our own bias to truly change the city government” (City agency staff, January 7, 2022).

Third, tolerance toward risks and mistakes was another organizational cultural determinant of innovation capacity in the OPI. This risk-taking culture was cultivated by the lab leader who provided protection for the lab staff from being unfairly criticized for failure or mistakes and also by the human-centered design strategy endorsed by the Bloomberg Philanthropies. Such tolerance toward risks and mistakes helped to build innovation capacity by encouraging the lab staff to spearhead into new solutions that might be criticized for potential failure.
Interviews with the OPI staff further showed that the OPI did not run into unnecessary risks but intentionally took risks where the innovation activities could out-benefit the potential risks. When there is a failure, the OPI had an open mindset to learn from the negative feedback to further improve its own knowledge to better generate new ideas and develop public sector innovation. One OPI staff said, “it’s okay to fail that there’s a failure in this process. That’s part of the process. We let them know that failing is part of the process. We failed and we try to figure it out again until we get it right. We had to learn from that failure because we can’t always predict in the planning stages. It’s okay. I get paid to fail. We got to learn what we did wrong and correct it in the next trial. We learn knowledge along the way to get the project done. That’s how we get it to innovate. But we are very intentional, and we do take our time to make changes so that we don’t rush into anything. It’s a delicate balance between doing new things and controlling or managing such risks and eventually turns those new ideas into good innovation and good results” (OPI staff, November 23, 2021).

1.3 Collaboration

**Intra-organizational collaboration.** Eight of ten interviews showed that collaboration with internal city agencies is one of the important determinants of innovation capacity in the OPI (a full list of internal partners is shown in Appendix D5). It helped to build innovation capacity by bringing in subject matter expertise to increase knowledge in the lab. According to interviews, since the OPI was a relatively small organizations, it may not have all the subject matter knowledge about government practices. That knowledge was critical to fully understand core issue in the public services or polices, given that those issues often fell within the responsibility across various domains of professional expertise. Collaboration with internal agencies enabled the OPI to further acquire new knowledge from different city agencies, to learn different
perspectives aspects of public problems, and increase knowledge about government operations so that the lab could increase innovation capacity to generate new ideas or alternative solutions. One OPI staff explained the essential of intra-organizational collaboration to build innovation capacity, “we want to get as many people as possible internal and external partners, residents involved in anything that we do. And they were there at the table helping to create it, we learn more from them, either feedback or ideas, and win support from them. We’re under-resourced both in hard and soft resources. We cannot acquire all the knowledge with only five or six of us. And finding those partners is critical to bolstering that capacity. When they heard something new or something they thought useful, they bring it to our meeting, and we talked about that and discussed what that means to our project. Their involvement really helped us to absorb more knowledge from different departments and disciplines. They helped us with what they know and helped us to find new information about the services” (OPI staff, December 3, 2021).

In the example of performance management reporting, all 22 city agencies and departments were involved with the OPI to co-design new performance metrics and reporting mechanisms. In working with those city agencies, the city agency staff helped the OPI to learn their professional knowledge about the definition of key performance metrics, priorities of the agencies’ tasks, and goals they wanted to achieve. They also helped to look for alternative performance framework in their field of services. With such additional professional knowledge, the OPI further worked with those city agencies to reflect upon their key priorities and how performance metrics can be related to their goals and budgets. At the enterprise level, the OPI managed to discover links between performance management among different departments and potential ways to demonstrate such interconnections on a performance panel. Those new insights, according to interviews, were not discovered before the involvement of the OPI but helped to simplify
performance reporting and to highlight how each city agency uses such metrics to guide budget and priorities. One city agency staff explained the importance of internal collaboration with the OPI in the following quote.

“It was really a good way to think about it instead of like a static process where here are the four metrics that you’re going to report on. It was more creativity involved, more critical thinking on what we’re trying to do as a department and how data and metrics relate to that. It’s about the whole story but can really show those returns on investments that we’re trying to bring for the residents in Minneapolis there. All departments shared what they had in performance metrics, what they know about things they want to measure. People would talk about how other city government measure the service. I shared some technical data issues with measures. I see they have that perspective and that context to understand what’s happening all across the city enterprise, and what’s needed to make things work across the city enterprise” (City agency staff, January 12, 2022).

Under the city coordinator’s office, the OPI had the advantage to connect and coordinate other city agencies in the public services or policies. As the highest unelected official role in the city, the city coordinator’s office acts as a “glue” between administrative functions. This provided the OPI a bird-eye view of city government functions and enabled it to build connections with all administrative departments and council members in the city government through frequent daily interaction. This gave the OPI advantages to locate and having access to internal staff with subject matter knowledge to build its innovation capacity for particular innovation projects.
“If you’ve got someone centralized within the city coordinator’s office, there is an underlying understanding and assumption that office has some level of reach within all departments. So I think having them located there reduces any likelihood of lost connections when individual personal relationships go away, which is helpful. When the city decided they wanted to take a critical look at who was responding to 911 calls, there really wasn’t anybody else in the city enterprise who had the capacity to do that work. It touched on many, many city departments. It touched on health and regulatory services and police, etc.” (City agency staff, December 21, 2021).

However, internal collaboration still seems challenging due to the lack of city agencies’ commitment to working with the OPI. As mentioned in section 1.2, the competing political interests and priorities seemed to hinder the alignment of city agencies’ strategies with the OPI’s innovation strategies. Without such commitment, interviewees mentioned that the OPI may not be able to continuously acquire subject matter expertise for new ideas and city agencies’ support to implement innovative solutions in the long term. One city agency staff explained the importance of building commitment to internal collaboration in the following quote.

“I think it’s important to help your internal client or partners really feel good about these relations and then build mindset so that we can share the same goal and really contributes our capacity and resources toward that goal. I think the process of how we do what we do matters. Like bringing people along with the lab rather than shoving them to the finish line. Like building those long-lasting relationships, long-lasting trust and belief in the type of work that the lab does” (City agency staff, January 7, 2022).
Collaboration with external partners. Interviews with the OPI staff showed that collaboration with external organizations did not seem to be an important determinant to increase its innovation capacity. The OPI was limited in developing networks and partnership with external organizations. One OPI staff mentioned, “I think that’s a missed opportunity for us as a team. And I think it’s probably because we’re so small. In another city, they have such a robust network of external partners like university researchers and professors, and nonprofits. I don’t see we have that as a team” (OPI staff, December 3, 2021). Even if an inter-organizational relationship were established, it would be a more transactional relationship than a collaborative partnership in the long term. The external organizations were involved in the implementation stage in which they were service vendors contracted for delivering specific components in the innovation projects, providing extra human and financial resources. Yet, they were less involved as long-term partners in the designing or exploration stage where they acted as a thought partner to build innovation capacity.

In the example of the alternative non-police response to community safety, a private vendor, Canopy Roots, was selected as the provider in Behavioral Crisis Response teams. It offers and trains The City’s Behavioral Crisis Response (BCR) teams which are operating 24 hours a day, Monday through Friday. The external partner said, “I think the relationship with the OPI, and the city government was more transactional. We had a contract with the city to provide mental health services. So we were not involved in the designing of the services. Because we are eligible for the criteria they listed, and we are a majority Black-owned business, I think we were selected to

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16 Launched on Dec. 13, 2021, the Behavioral Crisis Response (BCR) teams acted as a new first response that provides crisis intervention and connection to support services, two mobile units operate throughout Minneapolis. Each has a team of two behavioral health responders and outreach supplies, such as water, socks, snacks and toiletries. The units will be dispatched by Minneapolis 911 who will gather information and determine if the incident is eligible for a mobile behavioral health team response. https://www.minneapolismn.gov/resident-services/public-safety/unarmed-public-safety/behavioral-crisis-response/
provide the service to help people with a behavioral crisis when 911 get called” (External partner, February 3, 2022).

Instead of collaboration with external organizations, according to interviews, involving citizens was a key determinant of innovation capacity in the OPI. This helped to build innovation capacity by increasing knowledge in the lab with citizens’ live experiences and feedback. According to interviews, as the OPI’s ultimate purpose was to create new solutions to serve public needs and create public value, learning issues from citizens’ perspectives was critical to understand what the core issues were in the public services or policies. Through both large-scale surveys and direct interviews with community representatives during the early stage of the ideation procedure, the OPI learnt citizens’ first-hand experiences, needs, and opinions. They are found useful to point out possible blind spots in making public policies. Citizens provided alternative perspectives to re-new the assumptions that city government has on citizens’ needs. They further re-ordered the priorities of citizens’ needs to inform the new design of public services or policies. In this sense, involving citizens allowed the lab staff to discover new knowledge about where public services or policies needed new changes. Such new knowledge further increased lab’s innovation capacity and allowed it to generate more new proposals.

“We go out and we really make them understand that we’re public servants. We want to help you. We want to make this particular service or these particular services in the city serve you well or serve you better, but in order to do so, I need you at the table with me to understand your perspective, because I’m not going to guess what you need. I’m not going to look at a service because of how I might use it to determine that’s how you should use it. Our perception as a public servant might be wrong, even way off what really is happening with your life and
what you really need from the government. For the reimagining community safety, what we learnt from the community was how the police uniform meant more suppression to them instead of solving safety problems. This changed our assumption and made us to re-consider our first response forces and to think how non-police force could be used to improve community safety” (OPI staff, November 23, 2021).

The diverse population groups in the city of Minneapolis made social equity an important issue in innovation. According to interviews, to re-new the assumption of city government oriented toward white population, it was important to emphasize the cultural differences when engaging different types of populations. The OPI prioritized the engagement of historically marginalized populations to put their needs in front to creatively generate new ideas and solutions. This priority served an important role to provide an alternative perspective and break political and administrative bias that often ignore new changes in the city government to better serve BIPOC communities.

In the example of the alternative non-police response to community safety, involving citizens and prioritizing BIPOC communities was perceived as critical to unpack core issues in the police response and to create alternative behavioral crisis response teams that aim to amend racial discrimination in the community safety. “Working with a specialist in human-centered design, the Minneapolis team joined residents over a video link to role-play different situations and adjust the program design based on real-time feedback. Prototyping pointed to the need to make mental health training and specialists available to 911 operators responsible for triaging incoming calls. Residents also wanted educational resources that aimed at helping them to understand mental health crises and when to call for help. The extensive community feedback
significantly shaped two groundbreaking pilot programs that launched in Minneapolis last month. One of them is targeted at calls for help with persons experiencing mental health emergencies. Instead of sending police out to respond, those calls are now answered by two-person behavioral response teams trained in crisis intervention and counseling. The second pilot is aimed at non-emergency calls, such as problems with street parking or reporting low-level property crimes; those calls now primarily get routed to 311 or an online form” (Bloomberg Cities, 2022).

**Network governance.** According to interviews, network governance did not seem to be an important determinant to increase innovation capacity in the OPI. There was a lack of sufficient relationship management and boundary spanning with external partners. Despite the OPI being under the city coordinator’s office and having a leader networking with internal city agencies, as mentioned above in 1.2, it did not seem enough to resolve the competing political interests and priorities to build city agencies’ commitment in the long term. One OPI staff said, “we built relationships with staff through [the OPI leader], and I know someone in a certain department through previous projects. We did a lot of job of advertising what we do, making things public, and trying to bring people into the innovation world. But we do have some challenges and that challenge comes up with departments that are very risk averse like the IT department or protect the integrity of the city like the city attorney’s office. Politics are a big piece of this and there is a lot of lobbying and talking and advocating by [the OPI leader]. Those relations do not seem stable enough to me because sometimes we don’t see eye to eye with some folks and we do have to defer” (OPI staff, December 6, 2021). Because relationship management mainly depends on personal interaction, the internal collaboration is fluid and can change over time depending on city staff or elected official turnover.
Still, the OPI needed to enhance its boundary spanning to further build its innovation capacity. The OPI was currently working on the external out-reaching plan or communication strategy that aims to build connections with those partners with more shared understanding and shared commitment. Currently, the OPI missed the opportunities to collaborate with external partners more often and more deeply to leverage those new insights and expertise to more effectively generate new ideas and new solutions. It was critical for the OPI to further identify external partners with complementary skills and expertise to build its innovation capacity.

1.4 Knowledge and learning

Knowledge absorption. Eight out of ten interviews showed that the lab’s ability to learn new knowledge outside the lab was one of the key determinants of innovation capacity in the lab. Interviewees mentioned that having a diverse and broad scope of knowledge was critical given that public problems often fell in more than one domain of knowledge and required multiple disciplines of knowledge to find new solutions. Acquiring and assimilating new knowledge allowed the OPI to bring in additional perspectives to increase its knowledge so that it could discover new insights that led to new ideas for particular public problems. The alternative perspectives allowed the lab to break political or administrative constraints. The lab explored new practices in other locations so that city staff can consider different ways of public services and reveal new opportunities for change in the city government. The ability to acquire and assimilate new knowledge was facilitated by its dedicated team of staff and by its connection with other city agencies and involvement of citizens. This was explained by one OPI staff in the following quote.

“We really have to dig into what they’re doing in order to help. What we did was we find other examples that are doing this better. We shared those examples with
them and worked with them to change what they are currently doing. It will oftentimes pull the cover off things that they’re doing not that well. But on the other end of it, things end up much better. The process of unearthing things that some people would view as highlighting incompetency in their department. But our intent is just to figure out how we can do things better. It is essential to show people what are potential ways to do the job better, where the gap is from what we are to that potential, and then help them to change and perform better” (OPI staff, November 23, 2021).

For knowledge acquisition in the potential absorptive capacity, desk-top research and inviting external speakers were two useful mechanisms to learn new knowledge in the OPI. First, along with the ideation procedure, desk-top research allowed the OPI to find out alternative practices or solutions to public or social problems that other city governments had implemented. The lab staff spent their time to study exemplary practices in other city or local governments to identify potential new changes in the city of Minneapolis. Internal agencies were often involved to help collect new practices they knew in other cities.

In the example of alternative non-police response, the OPI conducted research on behavioral health crisis response in the city of New York City, Boston, Portland, and San Francisco. It also reviewed national guidelines for Behavioral Health Crisis Care. This research helped to discover multiple types of behavioral crisis responses that might be fit for the context of Minneapolis. It further guided the development of new response teams that are connected to the 911 call center and re-designed the response procedure inside the city government. One OPI staff said, “we provided a report on one project that would be able to look at the opportunity to build up resources so that an unarmed civilian response would take over all moving and non-moving
violations that occur in Minneapolis. We provided essentially a legal and data analysis around the viability of that policy in other cities and the viability of starting up a program like that here in Minneapolis. And we presented that research a couple of weeks ago to the council where we were able to say, this is possible. You have some services, but there are some steps that are needed to take going forward” (OPI staff, December 6, 2021).

Second, inviting external guest speakers to share new knowledge with the OPI was also useful to acquire knowledge. According to interviews, the OPI invited speakers from Bloomberg philanthropies, the Behavioral insight team, and among other philanthropies to share new trends in the use of experimentation or similar tools to promote innovative solutions in the city government. As mentioned in section 1.1, those external speakers brought in additional insights to reflect upon current practices of innovation methods in the OPI and helped to improve experiments and trials to support the design of new solutions. “Those have been pretty cool. There’ve been opportunities for the staff meeting, the group, the OPI folks, to do these meetings with those invited speakers and talk about what we would like us to cover. Let’s all talk about our work together and get to know each other as colleagues and try and identify ways where we can lean on each other in the future and as needed”, said one city agency staff (January 7, 2022).

For knowledge assimilation in the potential absorptive capacity, interviewees mentioned that the OPI evaluated the new insights and knowledge and integrated it with the existing knowledge base to generate new insights and then applied those insights in designing new solutions. Such updates in the knowledge base then further helped to identify new changes needed in the city government. New lessons learnt from other cities were adapted to the context of Minneapolis and helped to increase the pool of potential ideas that led to innovative solutions. Based on the new knowledge and insights, it managed to creatively develop new ideas or solutions that fit within
the context of Minneapolis. Through the iterative process, the OPI was able to company with city agencies to adapt the new solutions so that they can be fully implemented smoothly in the city government.

“We got lots of hands-on help from the OPI staff in crafting new performance metrics. We had a lot of new needs to measure such and that performance. We were brainstorming back and forth into what metrics we have and what we want to measure. And the only way we could have those lengthy conversations is if those staff had some genuine understanding of what it is we did. They rolled their sleeves and dived in with us. They brought in how other cities measure specific things. There were a lot of discussion about whether we need that measure or this measure, how that really links with our practices, how we adapt that to our department. This really helped us to re-think what we really want to measure and changed how we think the performance metrics and our practices” (City agency staff, December 21, 2021).

However, interviews did not show evidence that realized absorptive capacity, knowledge transformation and application, was important to determine innovation capacity in the Minneapolis OPI. As is shown in the section 1.1 and 1.2, the Minneapolis OPI mainly focused on the early stage of innovation process to help other city agencies to initiate and propose new ideas or changes. To apply new ideas and further transform public services or policies was required in the specific city agencies who were responsible to take up those new ideas and implement alternative solutions in the long term. According to interviews, in the Minneapolis OPI, the lab staff focused more energy on exploring new changes and their work often led to another round of financial investment from the city agencies responsible for implementation. If the initial ideas
turn into a new service program, a long-term financial investment to fund extra staff or private vendor for new service delivery. The lab helped the city agencies to estimate funding for staff, technologies, or equipment to implement innovative solutions. The actual translation of innovative ideas to innovation outputs still takes capacity focusing on managing changes in the implementation of innovative solutions.

In the example of the alternative non-police response to public safety, the OPI managed to lay out four pilots that test changes in behavioral health crisis response, 911 dispatch, and training city staff to embed behavioral health professionals in the 911 response to emergency calls. The process outlined the deliverables and key steps to manage those changes in the city government to better design and initiate the alternative procedure of response to emergency calls. The OPI proposed those changes to the city government and created behavioral health crisis response team in association with 911 and 311 dispatch office. The new non-police response team further transformed how the city government differentiate violent or non-violent crime and how the city government determine and help person in distress. One OPI staff explained, “we recommended the new behavioral crisis response (BCR) team to the city council and get approved last year (2020). What we did this year (2021) was to find the service vendor for training the team and to change 911 dispatch process in the police department. In the proposal, we outlined some situations when to call in the BCR team. But police department needs to apply those recommendations in their response process. Eventually, it was their duty to determine when to send a BCR team and when they need other emergency response team on the crime scene. The decision making may also be different as you have to decide whether the situation is safe enough for BCR team to step in. We had a lot of recommendations, but the department still
needed time and training to make the changes to make this new response team work” (OPI staff, January 7, 2022).

**Knowledge sharing.** Interviews with the OPI staff showed that knowledge sharing among the lab staff was key to innovation capacity in the OPI. Both knowledge collection and donation enabled the OPI to retain useful knowledge and expertise in the innovation lab, and thus build innovation capacity. Interviewees recognized the importance of knowledge sharing because individual staff may not have all the essential knowledge or expertise to manage innovation projects from start to end. Sharing knowledge among each other allowed the lab staff to learn from each other and improve their skills in managing risks and changes in the innovation process. Eventually, knowledge sharing kept alive the individual staff’s knowledge and allowed other team members to utilize learnt lessons for future innovation projects, adding to innovation capacity.

“I look to bring people who really bring a diverse skillset. As you do projects, you find out what more you need to learn. Not only from the project but as you’re interacting with people in departments and people on your team. They can learn those things if it’s not their strength and they learn it from the person on their team. And what makes our capacity really good right now is that everybody can learn from one another. And then learning from one another, it really increases our capacity to take on a lot more work, because we ended up with everybody gaining a certain amount of technical skill so that you don’t have to just count on one person and you can’t get a project done if one person is not available” (OPI staff, November 23, 2021).
For knowledge collection, the OPI developed reports, minutes, and presentation materials to document insights about specific policy issues and lessons they learnt about innovation processes. These documents were open to sharing with the OPI staff as well as with the other city agency staff. Interviewees mentioned that it helped the team members to learn about barriers or challenges in the process and how to overcome those challenges so that new solutions can be designed. One OPI staff said, “we’re working with every department in Minneapolis. That is a unique perspective that not many in the city get to have. We learn those success stories and pain points and document them in detail. Those become valuable knowledge we often resort to when we start something new. We look at what happened in previous similar projects, how we deal with that particular human-centered design process, and what to focus this time on this particular topic. This process is ongoing as we conduct more projects, we know more and better on how to manage innovation projects” (OPI staff, December 6, 2021).

For knowledge donation, the OPI staff helped each other on innovation projects when they needed to overcome challenges in the generation of new ideas or initial designs. The OPI staff managed to leverage each other’s skills better in the exploration of new ideas and management of innovation projects. One OPI staff said, “I think internal teamwork, synergies, openness and honesty and communication amongst in between team members are definitely critical. It is some “special sauce” within the team that synergizes our skills and expertise and really maximizes our potential in thinking creatively and promoting new ideas or solutions” (OPI staff, December 3, 2021).

**Learning orientation.** According to interviews, an orientation to learning was an important determinant of innovation capacity in the OPI by continuously increasing its knowledge base to support public sector innovation. This learning orientation was reflected in the OPI’s enthusiastic
staff toward innovation, ideation procedure allowing diverse perspectives, and organizational culture of innovativeness and openness. Having such an orientation to learning was key since public sector innovation often required new knowledge to identify new changes in the city government and existing knowledge quickly became obsolete. Interviews with city agency staff showed that the OPI was able to step into a specific policy area with minimum pre-assumptions and jump out of existing assumptions of government operations to reflect upon current issues from different angles to identify and manage new changes in the city government.

“What I think really allows them to be successful is an ability to walk in those different worlds. With credibility and with skill and a willingness really to be open-minded and to learn because they’re jumping into various city departments to do this work, not as content experts. They really need to approach it with some level of confidence in what they can bring and what they can do. But also, a level of humility and humbleness around not being subject matter experts and be willing to listen and to learn. Because in order to be effective, they need to become subject matter experts, but they come in recognizing that they aren’t and wanting to become that” (City agency staff, December 21, 2021).

In addition, the OPI staff were genuinely committed to learning and eager to learn from other city agencies to improve their innovation capacity. They were willing to explore knowledge areas and professional fields they were not familiar with and to build up their expertise in those areas. This included both professional knowledge in different city agencies and new skills of innovation, which added expertise in the OPI to build innovation capacity. One city agency said, “they will have conversations with the staff in those areas and really build up their expertise in those areas. They have such personalities, and they are kind of people who have a wide range of
knowledge, who have a very open mind, who is very curious and eager to learn, which has all been really helpful to have innovation capacity. They had a really a willingness to learn and a willingness to understand what I think and what it is I do” (City agency staff, December 21, 2021).

2. Summary on the Minneapolis OPI

In a short summary, the findings first showed key determinants in the four dimensions: resources, management, collaboration, and knowledge that influenced innovation capacity in the OPI. According to interviews and collected information, the OPI’s resources, a dedicated team of staff with diverse expertise for innovation in particular, were key to building innovation capacity. The small grants for each innovation project further enabled the MONUM to explore new ideas with flexibility. In addition, the use of data helped to introduce new changes in the public service and policy in the city government.

In addition to resources, the ability to use those resources for innovation was also key to innovation capacity in the lab. The lab leader played a key role in protecting the lab staff and networking with internal agencies to increase legitimacy of the OPI to use resources for innovation. The lab leader’s protection cultivated risk-taking culture in the lab that further increased the lab staff’s motivation for innovation. Leaders also played a key role in increasing connection with internal partners so that the lab managed to increase subject matter knowledge for innovation capacity. A clear and robust ideation procedure endorsed by Bloomberg Philanthropies helped to increase the of credibility of the OPI so that it is granted by the city councils to utilize its human and financial resources to pursue innovation.

Instead of collaboration with external organizations, involving citizens helped the OPI to acquire new knowledge with citizens’ live experiences and feedback. Its knowledge absorption
and sharing ability, focusing on bringing external new knowledge, allowed it to integrate additional perspectives to increase its knowledge that enhance its innovation capacity to generate new ideas and proposals. Eventually, the new knowledge acquired and assimilated in the lab were further applied in the public services and transformed practices in the other city agencies.
CHAPTER SEVEN
CROSS-CASE COMPARISON AND DISCUSSION OF FINDINGS

The primary purpose of this study was to examine key determinants of innovation capacity in innovation labs. Specifically, the study aimed to understand how different determinants influence labs’ innovation capacity. Chapter four to chapter six reported the findings from the individual labs. The findings showed how each determinant influence innovation capacity in each innovation lab. This chapter further compares three cases to illuminate the pattern of what the key determinants are and how those determinants influence innovation capacity in innovation labs. The chapter first presents the similarities and differences in the determinants of innovation capacity in three innovation labs. Then, I further discuss the findings of cross-case comparison to see how they reflect or expand the existing literature about the determinants of innovation capacity in government organizations. It shows important determinants of innovation capacity across three innovation labs and indicates the interaction in those determinants to influence innovation capacity. It further expands the literature by indicating important determinants in the early stage of innovation process and in the public sector. Finally, this chapter shows determinants that matter more in each lab and implies the influence of the context on the determinants of innovation capacity.

To do so, I created Table 7.1 to demonstrate the similarities and differences in the determinants of innovation capacity among three cases. According to Table 7.1, the findings of this study indicated that three innovation labs shared many similarities in terms of their determinants of innovation capacity. Those shared determinants included a dedicated multi-disciplinary team of staff who focus on public sector innovation, committed lab leaders, a clear ideation procedure with multiple innovation tools, innovative culture and tolerance toward risks,
internal collaboration with other city agencies, citizen involvement in ideation, knowledge absorption, knowledge sharing, and learning orientation. Yet, the availability of financial resources and realized absorptive capacity did not seem to be important to influence innovation capacity in those labs.

However, three innovation labs were different in the following three determinants. First, three innovation labs were different in the collaboration with external organizations and network governance to determine their innovation capacity. In the MONUM, external collaboration with organizations, especially research institutes and non-profit organizations, helped to increase innovation capacity by adding lab’s ability of knowledge acquisition. Instead, external collaboration seemed to have a less influence on the Seattle IP’s innovation capacity as it did not develop a mutual understanding and commitment with those technology companies to form a sustainable long-term partnership. Further, the Minneapolis OPI only had a transactional relationship with service vendors who were more involved in the implementation of specific components in the innovation projects and less in the long-term partnership for initiating and designing new ideas or proposals.

Second, they were also different in their flexibility in the use of financial resources, with the different sources of funding for innovation projects. The MONUM had a hybrid funding model with more external sources of funding than internal city budget for innovation projects. The external sources of funding granted the MONUM more flexibility to use the financial resources for projects that were not thought about before in the city government. Those external sources of funding allowed the MONUM to try new experimentation outside the budget cycle which was pre-determined at the beginning of the year and often did not allow changes in the use of funding. In contrast, the Seattle IP and the Minneapolis OPI did not have a wide range of external funding
for innovation projects, except Bloomberg Philanthropies’ funding. When the external funding depleted, they relied on the sponsor of city budget to support their staff and funding for projects. This required them to closely align with mayor’s office and other city agencies’ priorities to seek their support to acquire financial resources for exploring new ideas and proposals.

Third, the use of information technology has a different influence on innovation capacity in three innovation labs. In the Seattle IP, the use of information technology helped to introduce new changes in the city government and to facilitate digital transformation in the urban management. Most of the innovation projects proposed by the Seattle IP involved the use of online portals or data warehouse to explore new changes in the public services. In contrast, the use of information technology did not seem to be as important as other determinants in the MONUM and the Minneapolis OPI. Both innovation labs seemed to rely more on their lab staff’s expertise and skills to discover new insights from data and to increase their knowledge for enhance innovation capacity.

Those similarities and differences are further discussed below.
Table 7.1 Determinants of Innovation Capacity in the Innovation Lab

<table>
<thead>
<tr>
<th>Resources</th>
<th>Boston MONUM</th>
<th>Minneapolis OPI</th>
<th>Seattle IP</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Human Resources</strong></td>
<td>A dedicated team of staff passionate for innovation</td>
<td>A dedicated team of staff passionate for innovation</td>
<td>A dedicated team of staff passionate for innovation</td>
</tr>
<tr>
<td></td>
<td>• High level and diversity of education and professional backgrounds</td>
<td>• High level of professional in public affairs and skillsets in human-centered design</td>
<td>• High level and diversity of backgrounds and skillsets in human-centered design, data analytics, and project management</td>
</tr>
<tr>
<td></td>
<td>• Hire people outside government</td>
<td>• Training for new skills</td>
<td>• Training for new skills</td>
</tr>
<tr>
<td></td>
<td>• Small team with insufficient staff</td>
<td>• Small team with insufficient staff</td>
<td>• Small team with insufficient staff</td>
</tr>
<tr>
<td><strong>Financial Resources</strong></td>
<td>Flexibility of funding with external sources and a small amount for each project</td>
<td>Flexibility of funding with a small amount for each innovation project</td>
<td>Lack of flexibility with only internal sources</td>
</tr>
<tr>
<td></td>
<td>• Lack of stable funding flow in the long-term</td>
<td>• Lack of sufficient funding for long-term</td>
<td>Funding from city agencies with sufficient financial resources</td>
</tr>
<tr>
<td><strong>Information Technology</strong></td>
<td>Only important for technological projects</td>
<td>Not important for most innovation is non-technical</td>
<td>Technological tools to create IT-enabled solutions</td>
</tr>
<tr>
<td></td>
<td>• Data analytics for knowledge and idea exploration</td>
<td>• Data analytics for knowledge and idea exploration</td>
<td>• Data analytics as the starting point for new idea generation</td>
</tr>
<tr>
<td><strong>Management</strong></td>
<td><strong>Leadership</strong></td>
<td><strong>Leadership</strong></td>
<td><strong>Leadership</strong></td>
</tr>
<tr>
<td></td>
<td>• Committed to innovation and offer protection to staff</td>
<td>• Committed to innovation and protection to staff</td>
<td>• Committed to innovation and offer protection to staff</td>
</tr>
<tr>
<td></td>
<td>• Articulate the importance of innovation and develop innovation strategy</td>
<td>• Network with external and internal actors</td>
<td>• Articulate the importance of innovation and develop innovation strategy</td>
</tr>
<tr>
<td></td>
<td>• Network with external and internal actors</td>
<td></td>
<td>• Network with external and internal actors</td>
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<tr>
<td></td>
<td><strong>Vision and Strategy</strong></td>
<td><strong>Vision and Strategy</strong></td>
<td><strong>Vision and Strategy</strong></td>
</tr>
<tr>
<td></td>
<td>• A clear and broad strategy to pursue innovation</td>
<td>• A specific strategy using human-centered design</td>
<td>Innovation strategy prioritizing data and design</td>
</tr>
<tr>
<td></td>
<td>• Alignment with overall city government priorities</td>
<td>• Difficult in alignment due to competing political interests</td>
<td>• Alignment with overall city government priorities</td>
</tr>
<tr>
<td></td>
<td>• Narrow to mayor’s priorities</td>
<td></td>
<td>• Narrow to mayor’s big ideas</td>
</tr>
<tr>
<td><strong>Organizational Structure</strong></td>
<td>Position in the mayor’s office with legitimacy to pursue innovation</td>
<td>Lack of legitimacy being in the city coordinator’s office without a clear decision-making power</td>
<td>Position in the mayor’s office with legitimacy to pursue innovation</td>
</tr>
<tr>
<td></td>
<td>• A permeable structure for quick communication</td>
<td>• A clear ideation procedure based on design thinking to build credibility</td>
<td>• A permeable structure for quick communication</td>
</tr>
<tr>
<td></td>
<td>• A clear ideation procedure and pipeline of innovation</td>
<td></td>
<td>• A clear ideation procedure based on design thinking</td>
</tr>
<tr>
<td><strong>Organizational Culture</strong></td>
<td>Open mentality toward new ideas for innovation</td>
<td>Open mentality toward new opportunities</td>
<td>A culture of excellence and ambition toward innovation</td>
</tr>
<tr>
<td></td>
<td>• Tolerant about risks and learning from failures</td>
<td>• Learning from failures and risk tolerance</td>
<td>• Tolerant about risks and learning from failures</td>
</tr>
<tr>
<td></td>
<td>• Driven by citizens’ needs</td>
<td>• Driven by citizens’ needs</td>
<td>• Driven by citizens’ needs</td>
</tr>
<tr>
<td>Collaboration</td>
<td>Boston MONUM</td>
<td>Minneapolis OPI</td>
<td>Seattle IP</td>
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<td>-----------------</td>
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</tr>
<tr>
<td><strong>Intra-organizational Collaboration</strong></td>
<td>Collaboration with city agencies to increase subject matter expertise and resources for innovation</td>
<td>Collaboration with city agencies to increase subject matter expertise and resources for innovation</td>
<td>Collaboration with city agencies for subject matter expertise and resources for innovation</td>
</tr>
<tr>
<td></td>
<td>Less involvement of big departments (e.g., fire, police, or school)</td>
<td>Lack of integrating city agencies due to competing interests</td>
<td>A broad reach to other agencies from mayor’s office</td>
</tr>
<tr>
<td><strong>Collaboration with External Partners</strong></td>
<td>Collaboration with academia community and non-profits for additional skills and expertise</td>
<td>Lack of inter-organizational collaboration with external actors</td>
<td>Collaboration with technology companies through IAC for new technological solutions</td>
</tr>
<tr>
<td></td>
<td>Citizens’ inputs and feedback to identify new changes</td>
<td>Only transactional relationships for specific innovation projects</td>
<td>Lack of a mutual understanding and trust for sustainable partnership</td>
</tr>
<tr>
<td></td>
<td>Mutual trust and commitment toward innovation to maintain a sustainable partnership</td>
<td>Citizens’ inputs and feedbacks to identify new changes</td>
<td>Citizens’ inputs and feedbacks to identify new changes</td>
</tr>
<tr>
<td><strong>Network Governance</strong></td>
<td>An “open-door” mechanism to expand networks of partners</td>
<td>Lack of boundary spanning for external partners</td>
<td>Lack of network governance after exploration</td>
</tr>
<tr>
<td></td>
<td>Connect with key person to build initial trust and rapport</td>
<td></td>
<td>Lack of task coordination among voluntary partners</td>
</tr>
<tr>
<td></td>
<td>Routine meetings for relationship management and adaptation</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Knowledge and Learning</strong></td>
<td>Knowledge acquirement with desktop research and field visit to other city governments</td>
<td>Knowledge acquirement with desktop research and inviting external speakers</td>
<td>Knowledge acquirement with desktop research and attending workshops for new methods</td>
</tr>
<tr>
<td><strong>Knowledge Absorption</strong></td>
<td>Knowledge assimilation through iterative discussion and reflection with other city staff</td>
<td>Knowledge assimilation through iterative discussion to adapt to local context</td>
<td>Knowledge assimilation through iterative discussion and reflection with other city staff</td>
</tr>
<tr>
<td><strong>Knowledge Sharing</strong></td>
<td>Knowledge collection through documenting lessons learnt</td>
<td>Knowledge collection through documenting lessons learnt</td>
<td>Knowledge collection through documenting lessons learnt</td>
</tr>
<tr>
<td></td>
<td>Knowledge donation through learning groups</td>
<td>Knowledge donation through daily communication</td>
<td>Knowledge donation through routine project sharing</td>
</tr>
<tr>
<td></td>
<td>Lack of systemic skill mapping</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Learning Orientation</strong></td>
<td>Open mentality to reflect upon existing assumptions</td>
<td>Open mentality to reflect upon existing assumptions</td>
<td>Open mentality to reflect upon existing assumptions</td>
</tr>
<tr>
<td></td>
<td>Committed to learning new knowledge and skills</td>
<td>Committed to learning new knowledge and skills</td>
<td>Committed to learning new knowledge and skills</td>
</tr>
</tbody>
</table>
1. Importance and interaction in the determinants of innovation capacity

Across three innovation labs, the findings of this study showed there are many similarities in the determinants of innovation capacity. Among those shared determinants, the results further contribute to the literature by pointing out the four (categories of) determinants that are particularly important to innovation capacity in the government organizations: (1) human resources, (2) lab leaders, (3) intra-organizational collaboration, and (4) knowledge and learning. These four determinants were most mentioned in the interviews and were regarded as the most essential by those interviewees to enhance other determinants to influence innovation capacity in three labs. Further, the results expand the literature by identifying how these four determinants interact with each other and influence other determinants to increase innovation capacity in government organizations.

1.1 Human resources

Human resources seemed to be one of the most important resources to increase innovation capacity in terms of their level and diversity of expertise and motivation toward innovation. The findings reflected previous research on the role of multi-disciplinary staff as a crucial determinant (Criado et al., 2020; Timeus & Gascó, 2018). According to the innovation literature, innovation is a complex task which often requires more information than is possessed by a given individual. The combination of different backgrounds, competencies, and perspectives of employees sources the collective knowledge of the organization that is more likely to provide what is essential to achieve innovation (Aramburu & Saenz, 2011; Zohra, 2017). In the public sector, as government organizations face the growing complexity and wickedness of the problems and challenges (Ansell & Torfing, 2015), public sector innovation becomes fuzzier to
reach new ideas and requires knowledge and expertise from more than one domain (Meijer, 2014).

The findings of this study indicated that this was especially true in innovation labs when they focused on the exploratory stage of the innovation process where there were no clear answers to specific public problems and where new solutions were unknown to lab staff. The exploration of new solutions required staff time and energy to integrate information from multiple disciplines and reflect upon it iteratively to generate new insights for innovative ideas. Even though other city agencies have financial or data resources, the city agency staff spend most of their time utilizing the resources for day-to-day routines instead of thinking differently and introducing new practices that deviate from current government operations. In this sense, the dedicated lab staff with motivation oriented toward innovation is critical to break government organizations free from routine tasks and to re-direct organizational resources for the purpose of innovation, which increases innovation capacity in government organizations.

The findings further expand the literature by showing that a multidisciplinary staff with both public and non-public professional experiences helped to enhance innovation capacity through increasing knowledge absorption. The lab staff with their own expertise and professional backgrounds brought additional angles and knowledge to understand public problems. They provided new information to enrich knowledge in the lab by bringing in alternative practices based on their own professional experiences. In particular, combining public and non-public sector perspectives allowed innovation labs to understand government operations and at the same time bring in their other experience outside the government to renew what is going on inside the government. This allows the lab to absorb more new information and ideas that provide new opportunities to figure out the “fuzzy” realities with the discovery of new insights on public
problems. In this sense, a dedicated multidisciplinary team of staff with both public and non-public sector professional experiences increases innovation capacity indirectly through enhancing knowledge absorption in government organizations.

1.2 Lab leadership

Lab leadership was regarded by most interviewees as one of the most important determinants in management to increase innovation capacity in all three innovation labs. This reflected previous research on the role of leadership as a key determinant of innovation capacity (Boukamel et al., 2019; Mendoza-Silva, 2020). The innovation literature suggests that a mutual understanding and shared beliefs in innovation across an organization drives a sense of urgency among employees and focus them on achieving innovative solutions (Frishammar et al., 2012). Organizational leaders play a key role in creating such a sense of urgency by deciding how an organization’s resources are spent and what strategic direction the organization is heading for innovation (Al Othman & Sohaib, 2016). Often, leaders in the public sector were rarely tuned to innovation but to keep stability and to remain unchanged (Carstensen & Bason, 2012). Having a leader committed to public sector innovation, therefore, was critical to fight against a risk-averse environment in government organizations to pursue innovative solutions.

The findings of this study expand the literature by showing how the lab leaders facilitated other management determinants to influence innovation capacity. Previous studies suggest that innovation labs have authority and legitimacy to innovate because of proximity to political sponsor, providing protection to try new things and take risk (McGann, Blomkamp, et al., 2018) but endangering the labs’ survival during political transition (Lewis, 2020). In contrast to that, the findings of this study suggest that the lab leader played a more important role in fighting for labs’ legitimacy and autonomy for innovation as well as their survival. Regardless of distance to
political leadership, the lab leader adapted their priorities over time to the changes in the leadership of the city government. It alleviated some challenges in the political transition as leaders adapted innovation labs’ strategy and vision to new leaders’ priorities and win support from other city department heads. The adaptation helped to continuously build innovation capacity by better aligning with other city agencies’ strategy to obtain legitimacy for innovation.

In addition, the findings of this study further indicated how the lab leaders increase innovation capacity indirectly through enhancing human resources and internal collaboration. Previous studies suggest that leaders play an important role in further developing human resources through recruitment and training that are capable of innovation activities (Slater et al., 2014a). The results further suggest that leaders focus more on cultivating an innovative risk-taking culture to increase staff’s motivation for innovation than on directly increasing the availability of human resources. The staff feel empowered to utilize those innovation methods to take risks of exploring new solutions that have not been thought of before. Given the lack of sufficient human resources for increasing demands of innovation in the public sector, increasing staff’s motivation to innovate seems to be the main way in which leaders increase innovation capacity.

Further, the lab leaders increase innovation capacity indirectly through enhancing internal collaboration. They acted as key liaisons networking with internal partners through articulating the importance of public sector innovation to create a sense of urgency among employees across the city governments (Frishammar et al., 2012). The findings further expand the literature by showing why those leaders are able to connect with internal partners to increase innovation capacity. The results suggest that being in the central position in the city government and having long working experiences in the city government are critical. All the leaders in three innovation
labs sit in the center of the city government with the broad reach and frequent interaction with other city agencies. This allows them to build initial contact with key personnel in the rest of the government. Further, with a long working experience in the city government, the lab leaders are able to identify which departments are appropriate to involve in the projects, their priorities in the innovation, and how to align the labs’ strategy with them, creating a mutual understanding and a sense of urgency for innovation. Those characteristics of lab leaders enable them to build connection with internal government agencies, which further increases innovation capacity.

1.3 Intra-organizational collaboration

Intra-organizational collaboration was shared among three innovation labs as an important determinant in collaboration to increase innovation capacity. This reflected previous research on intra-organizational collaboration to enhance resources or skills to increase innovation capacity (Frishammar et al., 2012; Liao & Li, 2019; Yang et al., 2018). The innovation literature suggest that innovation comprises activities involving the joint use of skills, information, and knowledge as well as a collective bearing of risks (Liao & Li, 2019; Yang et al., 2018). Intra-organizational collaboration is a way to ensure that the expertise of each relevant department, unit, or function is incorporated into the process innovation activities (Lin, 2007). The findings of this study further suggest that this intra-organizational collaboration is critical since public problems are often wicked and fall within the responsibility across various domains of professional expertise in the city government. Facing the increasing complexity of public problems, acquiring new knowledge and expertise from multiple sources is required to build a holistic understanding of new ideas or innovative solutions.

The findings of this study further expand the literature by showing how intra-organizational collaboration increases innovation capacity through facilitating knowledge absorption. Previous
studies show that intra-organizational collaboration ensures the expertise of each relevant department, unit, or function is incorporated into innovation (Lin, 2007). This study further suggests that there are two different ways to integrate new knowledge through intra-organizational collaboration. In one way, innovation labs become a central hub to collaborate with other internal agencies to acquire new knowledge and to increase innovation capacity. Multiple sources of knowledge are integrated within innovation labs and then new insights are shared with other city agencies. Internal agencies acquire new insights through innovation labs. Both the Seattle IP and the Minneapolis OPI follow this way to act as an information hub within the center of the city government. In another way, innovation labs become a convener to facilitate collaboration among other internal agencies to share knowledge and expertise to increase innovation capacity. Two or more internal agencies may exchange new knowledge directly among each other, while innovation labs collect new insights from multiple internal partners for innovative ideas. The MONUM follows this way where it does not act as a central hub, but a participant in the intra-organizational collaboration. The difference seems to be relevant to the labs’ experiences in supporting public sector innovation. As the MONUM has the longest experiences among three innovation labs, it developed a stable connection with other city agencies and created a mutual understanding among them. This facilitates the city agency staff’s interests to innovate and gathers them to build a collective innovative mind that creatively explore new ideas.

The findings of this study further expand the literature by showing how intra-organizational collaboration enhances innovation capacity through increasing resources for innovation. This study further suggests that in addition to human resources and financial resources (Frishammar et al., 2012; Yang et al., 2018), intra-organizational collaboration brings in physical or virtual
spaces for piloting. This type of resources is particularly important during the ideation stage of innovation process to test pros and cons of initial ideas to determine the next step for innovation.

1.4 Knowledge and learning

Knowledge and ability to learn new knowledge was most mentioned determinants of innovation capacity across three innovation labs. To acquire new knowledge outside government allowed labs to learn new practices different from current government operations and to find new opportunities that led to new ideas for particular public problems. This result reflected previous research on knowledge innovation capacity often depends on how well organizations can enhance and manage their own knowledge through ongoing organizational learning and reflection for the purpose of generating new ideas and solutions (Boukamel et al., 2019; Gieske et al., 2016). The findings of this study further point out that in the public sector, having a diverse and broad scope of knowledge was critical given that public problems often fell in more than one domain of knowledge and required multiple disciplines of knowledge to find new solutions. The importance of knowledge and learning drives innovation labs to recruit multidisciplinary team of staff, to collaborate with internal agencies, and to bring in new knowledge and perspectives outside the city government to increase innovation capacity.

Among three sub-categories, learning orientation was regarded a critical determinant of innovation capacity in innovation labs. The findings reflected the previous research on the effect of learning orientation on innovation capacity in an organization (Podrug et al., 2017; Wu & Nguyen, 2019). The innovation literature suggests that to cope with rapidly changing and turbulent environment where the rate of knowledge obsolescence is high, organizations need to continually learn state-of-the-art knowledge and to unlearn old ways to build innovation capacity (Calantone et al., 2002; Stelmaszczyk, 2020). The findings indicated that this was particularly
true in innovation labs as they often faced new changes in the city governments and existing knowledge was often obsolete to tackle new public problems in the city. Such new changes and turbulent environment were especially so in the COVID-19 pandemic. The examples of innovation projects in the MONUM and the Seattle IP to tackle public problems in the pandemic indicated that this learning-orientation allowed the innovation labs to adapt quickly to new needs of innovation and to be responsive to new inputs from stakeholders to propose alternative solutions.

2. Important determinants in the different stages of innovation process

Across three innovation labs, the findings of this study showed that some determinants did not have the same effects on innovation capacity as predicted by the literature. Among those shared determinants, the results suggest that determinants may have different impact on innovation capacity in the different stages of innovation process. The findings of this study indicated that the needs for financial resources and knowledge absorption may change over the different stages of innovation process.

2.1 Financial resources

The findings of this study did not lend the support to that the availability of funding was critical to innovation capacity in the labs. Instead, a small amount of funding seems to allow more creativity. A small amount of funding for each innovation project grants the flexibility of using the funding to explore new ideas. This smallness of funding for each innovation project allowed innovation labs to avoid political ramification that was preventative for innovation to happen in the past. This result contradicts the literature on innovation capacity which suggests that slack financial resources offer flexibility for organizations to change (Bao et al., 2020;
Damanpour, 1991; Raghuvanshi et al., 2019) and the lack of sufficient monetary assets is regarded as a critical challenge for innovation in the public sector (O’Connor et al., 2007).

The results of this study indicate the needs of financial resources for innovation may change over the innovation process. In the previous studies, scholars examined the process leading to innovation products retrospectively and argued that the whole innovation process required a lot of financial resources (Kim et al., 2018; Madrid-Guijarro et al., 2013). Yet, when focusing on the early stage of innovation process for idea generation and selection, a small amount of funding is feasible since most of the innovation projects do not require large amounts of budget to initiate. In all three innovation labs, human resources and staff time seem more important to explore new practices different from current government operation. Smaller funding also means a smaller cost to take risks exploring new solutions that are not fully tested so that labs can reduce the risks if the new solutions were scaled up. Innovation labs resemble the style of start-ups with “lean innovation capability” that does not require large amounts of financial resources (Bicen & Johnson, 2014, 2015).

The need of financial resources increases when the initial ideas turn into new service program to be implemented by a specific city agency. The new ideas or proposals could further result in another round of financial investment from the city agencies responsible for implementation. During the stage of implementing innovation projects, sufficient financial resources are necessary to procure new equipment, hire new personnel, and/or contract vendors. The labs could propose additional financial resources for implementation to the city budget to ensure sufficient monetary assets are provided to deploy new service or policies.

Therefore, a large number of financial resources does not seem necessary to innovation capacity at the beginning. Government organizations may not need allocate a large portion of
budget dedicated to innovation work so that they can increase innovation capacity. Instead, it is possible to have a small amount of funding to initiate and test new ideas before making a larger investment in the implementation.

2.2 Knowledge absorption

The findings of this study indicated that potential absorptive capacity (knowledge acquisition and assimilation) seemed to be more critical to innovation capacity in innovation labs than realized absorptive capacity (knowledge transformation and application). A high level of potential absorptive capacity enables the innovation labs to bring in additional perspectives to increase its knowledge to build innovation capacity. It brings in new practices from other governments to inform alternative solutions so that innovation labs have innovation capacity to propose new changes in the current government operations. This result contradicts the literature on innovation capacity which suggests that both types of absorptive capacity are critical to innovation capacity, since an organization’s innovation capacity is not necessarily enhanced unless external knowledge acquired is further transformed and applied for the purpose of innovation (Berghman et al., 2013; Doz & Kosonen, 2010).

The results of this study indicate the needs of knowledge absorption for innovation may change over the innovation process. The previous studies draw the argument by investigating organizations which own innovation projects and implement final innovation outputs. Therefore, knowledge absorption happens within a single organization. Yet, in the context of innovation labs, the findings indicated that they might not have the ownership of innovation projects or are responsible to implement innovative solutions in the long term. When focusing on initiating new projects with or for other city government agencies, potential absorptive capacity seems more important since alternative solutions require deviations from existing heuristics in the
organizational knowledge base and the pluralism of new ideas in organizations. In all three innovation labs, they focus more on acquiring and assimilating new knowledge into the city government. This allows innovation labs to re-order the hierarchy of evidence and enable more open thinking and quicker insight building for new solutions to emerge. Their initial ideas or proposals are further refined and polished with the involvement of internal agencies for implementation in the future.

The need of realized absorptive capacity increases when initial ideas turn into a new program and to be implemented by a specific city agency. The actual translation of innovative ideas to innovation outputs still takes capacity focusing on managing changes in the implementation of innovative solutions. The city agencies still need to learn expertise and skills to transform the new knowledge into fully developed innovation outputs. In contrast to “moving quickly” during the early stage, the implementation requires more delicate and sophisticated consideration in funding, staff, equipment, technology, and/or training to fully transform government current practices to new ones.

3. Important determinants in the public sector

Across three innovation labs, the findings of this study showed that some determinants are particularly important in the public sector. Among those shared determinants, the results suggest that determinants may have more weight in the public sector than the private sector. The findings of this study indicated that an organizational culture tolerant toward risks is particularly important to innovation capacity in government organizations.

3.1 Organizational culture toward risks

Organizational culture was an important determinant in the management for innovation capacity in innovation labs. In particular, the findings of this study confirmed that tolerance
toward risks and failure was crucial to innovation capacity in an organization (Acevedo & Dassen, 2016; Bloom & Faulkner, 2016; John, 2014). The innovation literature suggests that innovation process is often associated with ambiguity, uncertainty, and risks, tolerance toward failure or mistakes increases employees’ psychological safety so that they are found to apply substantial resources into an unknown territory of innovation (Aljanabi, 2018; Dost et al., 2018).

This is particularly important since the public sector is often criticized by its risk averse culture as one of the most crucial barriers to public sector innovation (Bakici et al., 2013; Cinar et al., 2019). In the public sector, government staff are usually afraid of being critiqued and bad consequences in a failed project. They avoid making mistakes which may cause negative political ramification such as resignation. According to the findings of this study, the organizational culture of innovation labs is so different from the rest of the city government where city agency staff often do not have the luxury to make mistakes and where failure is considered as a negative result instead of a starting point of learning. Instead, private sector organizations have more tolerant toward risks and mistakes. They see failure as an opportunity to learn and improve so that the organizations further improve its innovation capacity. Therefore, in government organizations, having such a safe space with risk-taking culture that allows public employees to break away from stability and predictability enables new changes to emerge.

Yet, it was worth noticing that the level of risks acceptable to innovation labs in the public sector is different from private sector organizations. According to the findings, three innovation labs only took acceptable risks to the public and were driven by citizens’ needs and contexts of city governments instead of pursuing unnecessary public sector innovation, and thus avoid unnecessary risks. In the private sector, organizations take risks to explore an unknown territory so that they can achieve innovation ahead of their competitors to gain a relative advantage
(Aljanabi, 2018). In the public sector, government organizations do not necessarily need to become the first to invent, facing less competition than the private sector. Instead, public sector innovation is driven more by the creation of public value (Bekkers & Tummers, 2018; Chen et al., 2020; Meijer, 2019) than relative advantage in the private sector. This suggested that innovation labs encouraged public sector innovation new to the local context instead of new to the whole public sector. Orientation toward necessary risks helps innovation labs to gain legitimacy to use resources for innovation. It also helps to align with the rest of the government to seek their support and investment in the innovation projects that do not abruptly disrupt their structure or process of operation.

4. Important determinants in each innovation lab

Although three innovation labs shared many similarities, there were still differences in the determinants of innovation capacity in each lab. For the MONUM, external collaboration with research institute and non-profit organizations and a wide range of external sources of funding are particularly important to its innovation capacity. For the Seattle IP, the use of information technology is critically important to its innovation capacity to introduce new changes in the city government. For the Minneapolis OPI, the credibility of human-centered design strategy matters to its innovation capacity.

4.1 Collaboration and flexibility of funding in the MONUM

The findings of this study suggest that collaboration with different types of external actors and a flexibility in using external funding for innovation enable the MONUM to acquire knowledge, resources, and expertise to increase its innovation capacity. Compared to the other two innovation labs, the MONUM has managed to build a broad collaborative relationship mainly with research institute and non-profit actors to bring in additional knowledge to discover
the blind spots that may be neglected by public employees’ bias, which enriched the pool of potential ideas for public sector innovation. The MONUM also have more flexible external funding than internal budget to conduct an innovation project more quickly without waiting a long time for budget approval.

Such a difference seemed to be associated with the MONUM’s context and a longer history. As Boston’s colleges and universities exert a significant impact on the regional economy and their presence makes the city highly innovative, the MONUM had easy access to partners from research institutes. It also indicated that in the context of the public sector, collaboration with the research community or non-profits seemed to be easier than with private sector actors to build innovation capacity in the labs. The research or non-profits communities had a similar interest in the public affairs like the city government did and they were motivated in exploring new ideas or thoughts for new solutions to public or social problems. The MONUM developed a close and long-term relationship with those research institutes and non-profit actors and built a shared commitment toward achieving innovation outputs. In addition, the MONUM has been established for over ten years. The lab enjoys a good reputation in achieving innovation in the public sector. They have a sustainable partnership over years with non-profit organizations and philanthropies. This grants them the legitimacy and credibility to acquire external resources for multiple years to explore innovative solutions.

4.2 Use of information technologies in the Seattle IP

The findings of this study suggest the use of information technology matters more in the Seattle IP than the other two innovation labs. Compared to the other two innovation labs, information technology has been a central component to create new solutions in the Seattle IP’s innovation projects. Information technologies helped to introduce new changes in the public
service and digital transformation in the city government. The other innovation labs did not emphasize the use of information technology as explained by their principles that innovation is not always about the technological artifacts and technological innovation may worsen some public problems such as social equity.

The emphasis on the use of information technology in the Seattle IP may seem to be associated with its context and a shorter history. Seattle’s economy is driven by a mix of older industrial companies, and “new economy” Internet and technology companies, service, design, and clean technology companies. The Seattle IP took advantage of those technological companies to develop new IT-driven solutions. Yet, the Seattle IP had difficulties to sustain the connection with technology companies due to the lack of mutual understanding and shared goals in the innovation projects. With private sector actors, as the case in the Seattle IP, it seemed easier to form a more transactional or contractual relationship than a partnership given the large disparity in the goals and purposes of public and private sector organizations. In addition, the Seattle IP has been established for only four years and the IAC was established in 2019. The lab still needs to develop the strategy for network governance to better manage the relationship with private sector organizations.

4.3 The credibility of human-centered design in the Minneapolis OPI

The findings of this study suggest that a credible ideation procedure is critical to innovation capacity in the Minneapolis OPI. Compared to the other two innovation labs, such an innovation method matters more in the Minneapolis OPI to gain credibility to pursue innovation. Having a clear innovation strategy around human-centered design created a clear identity of the OPI to the rest of the city government and clarified its potential value. It provided a certain level of credibility of the OPI so that it is granted by the city councils to utilize its human and financial
resources to pursue innovation. The other two innovation labs do not emphasize the credibility of innovation methods as an important determinant.

The emphasis on credibility of innovation methods may seem to be associated with the weak mayor-council form of government in the Minneapolis. In the Minneapolis, instead, the lack of an authoritative political leader made it challenging to seek a strong political sponsor for the innovation lab. The Minneapolis OPI found it difficult to align with city government goals, given the competing political priorities and interests in the city councils. Even though the city coordinator’s office is one of the biggest offices in the administrative branch, its lack of a clear decision-making power to take charge of specific government operations does not grant the OPI a clear level of legitimacy to pursue public sector innovation. To gain credibility, an ideation procedure endorsed or legitimized by innovation experts would increase the legitimacy of innovation labs to utilize resources for new ideas or proposals. It helped to convince the rest of the government to work with the OPI to explore alternative solutions to public problems. Therefore, a proven method or technique of innovation is regarded as an alternative source of trust in competencies in a context lack of political sponsors.

This reflected the literature about innovation labs that the small and autonomous structures that operate somewhat outside traditional bureaucratic lines of authority make them relatively easy to shut down compared with more established public sector organizations (Lewis et al., 2019; McGann, Lewis, et al., 2018; Mulgan, 2014). Their survival relied heavily on the proximity to leadership. Yet, the findings of this study suggested that proximity to political leadership may only work when there is an authoritative political leader with a consistent decision-making power in the city government. When there lacks an authoritative political leader
or when their decision-making power is inconsistent, innovation labs need to find alternative way
to establish their credibility so that they are granted legitimacy for innovation.
CHAPTER EIGHT
CONTRIBUTIONS AND FUTURE RESEARCH

In recent years, there has been a growing interest in building innovation capacity in government organizations, facing the increasing demand for public sector innovation to solve “wicked” public problems. Innovation capacity enables government organizations to adapt themselves to the external environment, learn new knowledge, and reconfigure internal resources rapidly while going through changes so that they manage to achieve sustainable public sector innovation (Gullmark, 2021; Trivellato et al., 2021). Yet, far less attention have been given to understand what determines innovation capacity in government organizations, although some specific aspects of innovation capacity have been scrutinized empirically (Lewis et al., 2018; Sørensen & Torfing, 2011).

Innovation labs are one type of government organizations that are assumed to have innovation capacity to encourage innovation (Lewis, 2020; Unceta et al., 2019), which provides an opportunity to examine the key determinants of innovation capacity. The purpose of this dissertation was to contribute to the knowledge of innovation capacity in government organizations by exploring key determinants of innovation capacity in three innovation labs in the U.S. The dissertation makes a contribution by using an organizational capacity framework to understand how those determinants in four dimensions (i.e., resources, management, collaboration, and knowledge and learning) influence labs’ innovation capacity. The results of this study expand the literature by identifying the importance and the interaction in the determinants to influence innovation capacity in government organizations.

The reminder of this chapter presents a conclusion drawn from this study. First, it summarizes the main findings of the three case studies. They are summarized according to the
research question in chapter one. Second, the chapter presents both the theoretical contribution and some policy implications of this study. Finally, the chapter presents avenues for future research.

1. Summary of key findings

This section describes the key research findings from the study. Based on 40 interviews, 78 news reports, and 74 blog entries, the main findings are presented below

**Research question: What are the key determinants of innovation capacity in innovation labs?**

The question of this study aims to explore key determinants that influence innovation capacity in the innovation labs in three different city governments. The study confirms that four dimensions of determinants (i.e., resources, management, collaboration, and knowledge and learning) matter in influencing innovation capacity in the innovation labs. Within each dimension, the findings further identify key sub-categories of determinants in the labs.

**Resources.** Multi-disciplinary human resources dedicated to public sector innovation are critical to building innovation capacity in the innovation labs. The small amount of funding for each innovation project is found critical for innovation capacity by increasing the flexibility of using financial resources to explore new ideas that are not thoroughly tested. A hybrid funding model with multiple sources seems to work better than a single source funding model. It ensures the flexibility to use financial resources so that an innovation lab may be able to use more innovation tools that are non-traditional in the public sector. The use of information technology seems to only matter in the city with advantages in technology.

**Management.** The lab leaders play an important role in building innovation capacity through articulating the importance of public sector innovation, networking with internal and external
partners, and cultivating a risk-taking culture. The use of innovation methods or tools that are not usual in the city government further enables innovation labs to create a pool of potential ideas for problems with no clear solutions and to manage changes or risks along the innovation process. With a risk-taking culture that allows lab staff to break away from stability and predictability enables new ideas to emerge in innovation labs. A proven method or technique of innovation seems matter more to gain labs’ credibility for innovation in a context lack of political sponsors.

Collaboration. Collaboration with internal agencies and citizen involvement increase innovation capacity in the innovation labs by providing various information, knowledge, and resources to generate more public sector innovation. Yet, external collaboration seems to be influenced by availability of innovation resources in the city. For innovation labs in the public sector, collaboration with research and non-profit organizations seems easier than private sector actors, since they may have a similar interest in the public affairs like the city government and they are motivated in exploring new ideas or thoughts for new solutions to public problems. Network governance to expand and maintain a good relationship with those partners is key to managing the use of partners’ expertise and resources appropriately.

Knowledge and learning. Having a learning orientation in the labs is key to building innovation capacity by increasing diverse knowledge and perspectives for identifying new changes in the existing city government, especially in a rapidly changing and turbulent environment. Through desk-top research and learning from other public or private sector actors, innovation labs increase their innovation capacity by acquiring and assimilating new external knowledge that helps to indicate new opportunities for public sector innovation. Potential absorptive capacity is more important than realized absorptive capacity since innovation labs focus more on initiating new projects with or for other city government agencies who are
responsible for implementing and maintaining final innovation outputs. Constant knowledge sharing further helps to keep alive the innovation lab staff’s skills and expertise to cross-fertilize additional new ideas.

2. Theoretical contribution

First, this study makes contributions to the literature about innovation capacity in government organizations by examining key determinants in a structured and comprehensive way. While some studies examined specific aspects of innovation capacity (Lewis et al., 2018; Sørensen & Torfing, 2011), there still lacks empirical studies to explore innovation capacity through a comprehensive framework. The study fills the gap using an organizational capacity framework and examines the dimensions and sub-categories that are underexplored. While previous studies have mainly explored the effects of resources (human, financial, and technological resources) on innovation capacity (Haug & Mergel, 2021; Vrabie & Ianole-Călin, 2020; Whicher, 2021), the study identified the effects of vision and strategy, ideation procedure, collaboration and network governance, knowledge sharing and learning orientation on innovation capacity in innovation labs. The study contributes to building a holistic picture of key determinants of innovation capacity in government organizations.

Further, the findings of this study flesh out the relationship between determinants in the labs and identify the importance of those determinants. Previous studies do not seem to identify the importance of determinants since they focus on specific aspects of innovation capacity. By examining the innovation capacity in a more structured way, this study helps to identify determinants that are perceived more important. In the innovation labs, human resources, lab leaders, intra-organizational collaboration, and knowledge and learning are found critical determinants of innovation capacity to tackle risks and uncertainty in public sector innovation.
The study also contributes to the literature by adding how those determinants interact with each other to influence innovation capacity. First, the results highlight that the importance of professional experiences in both the public and non-public sector to form a multidisciplinary team of staff so that they are able to understand government staff and also to absorb external information useful to government situation to increase innovation capacity. Second, the results point out that it is critical for lab leaders to be in the central position in the city government and have long working experiences in the city government so that they are able to connect with internal partners to increase innovation capacity. Finally, this study further identifies two different ways to increase knowledge absorption through intra-organizational collaboration to increase innovation capacity. In one way, a central hub is developed to collaborate with other internal agencies to acquire new knowledge and to increase innovation capacity. In another way, a convener facilitates a multi-lateral network among internal agencies to share knowledge and expertise to increase innovation capacity. When innovation labs interact with city agencies in the long-term, a mutual understanding could be created among them to form a collective innovative mind that creatively explore new ideas.

Second, the findings of this study further expand the literature by differentiating the effects of financial resources and knowledge absorption in the different stages of innovation process. The need of financial resources and realized absorptive capacity increases when the initial ideas turn into new service program to be implemented by a specific city agency. When focusing on the early stage of innovation process for idea generation and selection, a small amount of funding is feasible and potential absorptive capacity seems more important to deviate from existing heuristics in the organizational knowledge base. It points out that not all determinants matter the same across the whole innovation process. Innovation capacity can be differently activated
according to the innovation process phase. The framework of innovation capacity needs to take into account the temporal aspect of innovation capacity.

Third, the findings of this study also suggest how the context may influence determinants of innovation capacity in government organizations. In the context of public sector, a non-competitive environment may drive government organizations to have an orientation toward citizens’ needs and a cautious attitude toward taking risks. Further, the level of innovativeness and the form of government also influence specific determinants that matter in each innovation lab. In an environment with a high level of innovativeness, innovation labs tend to seek external collaboration to increase their knowledge and resources to increase innovation capacity. In contrast, in an environment with the lack of an authoritative political leader, it is critical for innovation labs to gain credibility to utilize resources for innovation projects. An ideation procedure endorsed or legitimized by innovation experts is important to increase the legitimacy of innovation labs to utilize resources for new ideas or proposals.

Finally, innovation labs with a longer history may have different determinants of innovation capacity from those with a shorter history. The study highlights that those labs with a longer history enjoy a good reputation in achieving innovation in the public sector. They have a sustainable partnership over years with external partners and sponsors. This grants them more legitimacy and credibility to acquire external resources for multiple years to explore innovative solutions than those with a short history. For lab starters, it seems important to gain credibility with government organizations to acquire legitimacy and autonomy to utilize resources to pursue innovative solutions that are not usual in governments.

3. Policy implication
The dissertation has several policy implications to establish innovation labs and to increase innovation capacity in government organizations. Given that innovation labs are small units in the public organizations that focus on the early stage of innovation process, the results of this dissertation are applicable to units/departments who are initiating innovation projects and undergoing the early stage of innovation process, such as generating, selecting, and testing ideas. In addition, the results are also applicable to units or departments who are responsible for organizational change, organizational reform, or digitalization, such as reform committees, digital government units, or policy design team. Those units, focusing on transforming public sector organizations into new practices, also share similar purposes and need similar innovation capacity to achieve alternative solutions.

To establish an innovation lab inside a city government, first, it is important to recruit a dedicated team of staff with diverse educational and professional backgrounds. The labs’ innovation capacity depends on human resources to increase new knowledge inside the labs. In hiring process, government organizations can deliberatively seek people with experiences in both the public and non-public sector. In such a way, the lab staff can understand how government staff think and to bring new knowledge from outside government to develop new insights for innovation. If hiring new staff is difficult to government organizations, hiring interns is one way to recruit a dedicated team for innovation work. Government organizations can propose a summer or year-long internship to recruit people with professional backgrounds outside government to increase new knowledge for innovation capacity. Because interns do not have day-to-day responsibilities, this ensures the internship team to have time and flexibility to follow specific innovation projects. Training current staff with new methods for innovation is another
way to help staff gain new knowledge outside government. It helps current staff to combine what they know in government operations and what is possible to develop alternative practices.

Second, it is useful for the lab leaders to the people in the central position in the city government and have long working experiences in the city government. Those suitable people could include but not limited to deputy mayor, chief of staff, chief information officer, chief innovation officer, and policy advisor to mayor’s office. They often have a broad reach and frequent interaction with other city agencies and understand priorities in those agencies. This enables innovation labs to connect with internal agencies to obtain more resources for innovation.

For lab leaders, connecting with other department heads and winning their support to innovation labs’ work is important. To start, lab leaders need to establish their own identity. This entails to clarify the purpose, strategies, advantages, and potential value that innovation labs have. This demonstrates an image to other city agencies about what innovation labs are. Then, based on leaders’ own experiences, they can start to approach city agencies which are interested in innovation to solve public problems but without sufficient number of staff to conduct innovation activities. The lab leaders can approach them as an extra hand to help them create innovative solutions. At the beginning, the lab leaders could use informal personal network to connect with city agencies. This helps to build rapport and initial trust with key actors to start a collaborative relationship.

Finally, it is important to have a flexibility of funding to support initiation of innovation projects and a stable funding to support the implementation. In addition to the city government budget, multiple external sources of funding could be considered by innovation labs. First, innovation labs could consider applying for innovation grants from entities that advocate and propel public sector innovation and innovation labs, such as Bloomberg philanthropies or
NESTA. Those entities are dedicated to support public sector innovation and share interests with innovation labs to fund innovation projects. Second, innovation labs could consider financial institutes such as banks to acquire funding for innovation projects. Third, innovation labs could partner with non-profit organizations for fundraising to increase financial resources for innovation projects. Non-profit organizations have a similar interest in the public affairs with government and they are motivated in exploring new ideas to public or social problems. They have more skills and expertise in fundraising to help innovation labs’ financial resources.

4. Future research

This dissertation also provides directions for future research on the topic of innovation capacity and innovation labs in the public sector.

First, quantitative methods could be further utilized in future research to investigate key determinants of innovation capacity in other government organizations. In this study, a comprehensive analytical framework is developed to understand the importance of the relationship between those determinants and innovation capacity. The framework could be further used to conduct a quantitative study to estimate the actual impacts of each determinant on innovation capacity. This would help to further evaluate the importance of determinants based on the scale of impacts. In the near future, I plan to develop a survey with measures in the framework to understand core determinants or combinations of determinants to increase innovation capacity in government organizations.

Second, the findings of this study indicate a potential influence of the contexts in which the innovation labs are embedded, particularly form of government and level of innovativeness. It suggests that innovation labs in a form of government with an authoritative political leader are more likely to have legitimacy to pursue innovation projects. The level of innovativeness in the
city may influence what types of external actors those innovation labs collaborate with. Future research can further explore innovation labs in a political stable environment, for instance, a non-democratic system, to understand the effects of political environment on the determinants of innovation capacity in the innovation labs. Future studies can also explore the effects of other important contextual factors, such as administrative culture, on the determinants of innovation capacity in government organizations.

Third, while organizational capacity framework provides the guidance to explore innovation capacity, using such a framework could possibly leave out other determinants that are not included. Future research could explore innovation capacity in government organization using an inductive approach or ethnography to identify new determinants outside the four dimensions (i.e., resources, management, collaboration, and knowledge). For instance, future research could further explore the role of physical space layout in determining innovation capacity in innovation labs. Others may further focus on digital or non-digital tools in the innovation labs, such as the use of virtual reality tools, to influence innovation capacity.
REFERENCES


237


## APPENDIX

### A. Operationalization of determinants of innovation capacity

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<thead>
<tr>
<th>Sub-category</th>
<th>Determinant</th>
<th>Operationalization</th>
<th>Reference</th>
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</table>
| Human resources                  | Level of employees’ knowledge and skills         | 1. Our employees possess high education levels and specialized training  
2. Our employees possess professional experience in different activities and highly skilled  
3. Our employees possess specific competencies that are adequate to innovation activities in the organization  
4. Our employees participate on training initiatives related to innovation and successfully apply the knowledge they acquire                                                                                                                     | Costa & Ramos, 2015; Nazarpoori, 2017; Donate et al., 2016 |
|                                  | Diversity of employees’ knowledge and skills     | 1. Our employees possess (among them) a heterogeneous academic education                                                                                                                                                                                                                                                                                                           | Costa & Ramos, 2015                                      |
|                                  | Employees’ attitude and motivation               | 1. Our employees are enterprising and creative and are willing to take risks  
2. Our employees are interested in idea generation activities and enjoy coming up with new ideas  
3. Our employees enjoy finding solutions to challenging and complex problems  
4. Our employees enjoy improving existing products or services                                                                                                                                       | Costa & Ramos, 2015; Tierney et al., 1998               |
| Human resource management        | Hiring                                           | 1. The hiring process is highly selective and contains several tests  
2. Our organization selects employees based on their level of expertise and skills  
3. Our organization selects employees based on their future potentials                                                                                                                                   | Chen & Huang, 2009; Donate et al., 2016                 |
|                                  | Training                                         | 1. Our organization offers comprehensive training programs to a large number of workers  
2. Our organization frequently hosts formal training activities  
3. Our organization provides training for new hires  
4. Our organization provides training for problem-solving abilities and creativity  
5. Our organization spends a lot of resources on training activities                                                                                                                                         | Chen & Huang, 2009; Donate et al., 2016                 |
|                                  | Performance and reward                           | 1. Our organization rewards employees for sharing knowledge and experience with their colleagues  
2. Our organization rewards employees for their knowledge and skills development  
3. Our organization rewards employees for generating new ideas and insights  
4. Our organization performance appraisal process tolerates mistakes that are non-repetitive                                                                                                                                                                       | Al Othman & Sohaib, 2016; Donate et al., 2016           |
|                                  | Employee empowerment                              | 1. Employees are involved in the decision-making process for both short and long-term planning  
2. The decision-making is delegated to the employee who is responsible to perform the task  
3. Employees are encouraged to make suggestions to improve the work  
4. Employees’ opinions and suggestions are valued by the authority and can potentially influence the organization                                                                                                                                  | Cakar & Erturk, 2010; Chen & Huang, 2009                |
| Financial resources              | Availability of financial resources              | 1. Compared to our organizational size, our available funding is large  
2. Compared to our organizational size, we have very little retainedavings per year  
3. Compared to our organizational size, the working capital is very tight  
4. Compared to our organizational size, we have a large amount of short-term investment                                                                                                             | Bao et al., 2020                                         |
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<th>Sub-category</th>
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| Discretion of financial resources | 1. Our organization has the full authority to determine the usage of funding  
2. Our organization has the flexibility to change the usage of funding  
3. Our organization use funding for exploring new directions that are not pre-define in our plan | Sharifman et al., 1988 |
| Information technology | IT for knowledge management 1. Our organization provides various tools and technologies to facilitate knowledge-sharing and exchange experiences (e.g., email, intranet, and groupware)  
2. Our organization provides expensive electronic storage for employees to access data/information/knowledge (such as online databases and knowledge bases)  
3. Our organization provides the technological tools that allow employees to collaborate by sharing their knowledge  
4. Our organization routinely utilizes computer-based systems to access information from outside databases  
5. Our organization has set procedures for collecting user information from online sources  
6. Our organization uses computer-based systems to manage and analyze service user information | Al Othman & Sohaib, 2016; Aramburu & Saenz, 2011; Miriam Delgado-Verde et al., 2011; Turulja & Bajgorić, 2016 |
| IT for collaboration and interaction | 1. Our organization offers digital platforms to support real-time information exchange with our major partners  
2. Our organization offers digital platforms to electronically interconnect with users  
3. Our organization offers digital platforms to support online collaborative activities across organizational boundaries | Wang et al., 2017; Aramburu & Saenz, 2011 |
| Leadership | Leaders’ attitudes and commitment 1. Organizational leaders are interested in innovation  
2. Organizational leaders feel comfortable to take risks regarding innovation  
3. Organizational leaders promote activities related with innovation  
4. Organizational leaders are keen to provide most of the necessary environment, help, and resources to help the staff conduct innovation | Al Othman & Sohaib, 2016; Moon-Koo Kim et al., 2018 |
| | Leaders’ activities and skills 1. Organizational leaders communicate the importance and the need for innovation to employees  
2. Organizational leaders allocate employees and funding that allow exploration of new products and services  
3. Organizational leaders promote human resources development that aims to hire and train people capable of innovation  
4. Organizational leaders connect with people within and outside the organization for essential resources for innovation | Tikas & K.B., 2017 |
| Vision and strategy | Innovation strategy 1. Our organizational leaders show commitment to develop innovation  
2. Our organization has different policies and guidelines related to different domains of innovation  
| Strategic alignment | 1. Our organization formulate innovation strategy in a way that focuses on improving employee commitment, morale, and skills for innovation development | Vicente et al., 2015 |
| Organizational structure and procedure | Idea generation process 1. Our organization has a clear way of processing and developing ideas  
2. Our organization uses different techniques of creativity and idea generation  
3. Our organization welcomes new ideas from employees at all organizational levels  
4. Employees have available time and resources for creative activities and idea generation  
5. Our organization involves external partners to create new ideas  
6. Employees get feedback to improve their new ideas through a multicriteria feasibility study and overall innovation strategy | Saunila & Ukko, 2013; Doroodian et al., 2014; Prajogo & Ahmed, 2006; |
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| Decentralization | 1. Our organization makes decisions through communication with employees of all levels and not only by top management  
2. Our employees’ opinions and knowledge are well communicated before making decisions  
3. Our employees have wide latitude and flexibility in deciding the means to accomplish the goals of their tasks  
4. Our employees can frequently participate in the decision-making process | Dekoulou & Trivellas, 2017; Moon-Koo Kim et al., 2018; Gil et al., 2018; Daugherty et al., 2011 |
| Organizational culture | Innovative culture | 1. Our organization places emphasis on new programs/services/administrative techniques and procedural changes  
2. Our organization is oriented toward searching for new opportunities for experimentation and exploration of new territories  
3. Our organization has an open mentality toward new opportunities and new trends in the context | Jin & Lee, 2020; Aramburu & Saenz, 2011 |
| Tolerance of mistakes, failure, or risk | 1. Our organization has a strong proclivity for high-risk projects with great potential and opportunities  
2. Our organization typically adopts a bold, aggressive posture to maximize the probability of exploiting potential opportunities, when confronted with external uncertainty  
3. Our employees feel safe undertaking risky projects which may have a high probability of failure  
4. Our employees feel safe making mistakes and failures and discuss them with colleagues for help and feedback | Jin & Lee, 2020; Dost et al., 2018; Andersson et al., 2020; Bastic & Leskovar-Spacapan, 2006 |
| Proactiveness | 1. Our organization typically initiates changes that other agencies or departments follow or adopt  
2. Our organization is very often the first to introduce new products or services  
3. Our organization takes entrepreneurial opportunities to initiate new programs/services and changes to procedures and technologies | Dost et al., 2018; Jin & Lee, 2020 |
| Citizen-orientation | 1. Our organization frequently communicates information about citizens’ experiences across all members  
2. Our organization frequently explores citizens’ needs for our services and products  
3. Our organization regularly surveys citizens to assess the quality of our products and service  
4. Our organization is driven by the understanding of citizens’ needs to develop goals and strategies | Grawe et al., 2009 |
| Intra-organizational collaboration | Cross-functional communication | 1. In our organization, employees have a close relationship with each other  
2. In our organization, employees frequently communicate with others for problem-solving  
3. In our organization, employees from different units frequently cooperate for problem-solving | Ganguly et al., 2019 |
| Collaboration with external partners | Inter-organizational collaboration | 1. Our organization often engages in formal and informal cooperation and exchanges with external partners  
2. Our organization engages in a regular exchange of information, knowledge, and ideas between the partners in collaboration  
3. Our organization often partners with private companies in developing new products or services  
4. Our organization often partners with academic institutes (universities or research institutes) in developing new products or services  
5. Our organization often partners with non-profit organizations in developing new products or services  
| Collaboration with citizens/users | 1. Our organization regularly shares critical information about products or services with citizens  
2. Our organization involves citizens in the development of new products or services | Pedron et al., 2018; Ru-Jen Lin et al., 2010 |
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<tr>
<td></td>
<td></td>
<td>products or services</td>
<td>Ganguly et al., 2019; Weber &amp; Heidenreich, 2018; Akhavan &amp; Hosseini, 2016</td>
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<td></td>
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<td>3. Our organization involves citizens periodically in the reviewing and modification of products or services</td>
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<td>4. Our organization involves citizens periodically in the evaluation of their needs</td>
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<td>5. Our organization partners with key citizens in interactive two-way communication to develop new products or services</td>
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<td>6. Our organization partners with key citizens to overcome challenges in the innovation process in the long term</td>
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<tr>
<td>Shared motivation, understanding, and commitment</td>
<td>1. Our organization and partners share the same ambitions and visions for collaboration and innovation</td>
<td>Weber &amp; Heidenreich, 2018; Akhavan &amp; Hosseini, 2016</td>
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<tr>
<td></td>
<td>2. Our organization and partners agree on what is important for collaboration and innovation</td>
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<td>3. Our organization and partners agree on the importance of collaboration for innovation</td>
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<td>4. Our organization and partners commit to maintain collaboration and to pursue collective goals</td>
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<tr>
<td>Trust</td>
<td>1. Our organization relies on the information those partners are providing us</td>
<td>Ze et al., 2018; Meijer, 2019; Kulangara et al., 2016; Saenz &amp; Perez-Bouvier, 2014</td>
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<td>2. Our organization can rely on those partners when we have difficulties at work</td>
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<td>3. Our organization believes that partners will treat us fairly</td>
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<td>4. Our organization believes that partners will treat us truthfully</td>
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<td>5. All partners are trustworthy in keeping the agreements or promises</td>
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<td></td>
<td>2. Our organization is able to find partners to provide complementary skills and knowledge in the development of innovation</td>
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<td>3. Our organization usually contacts potential partners through phone, e-mails, letters, and/or fax frequently</td>
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<td>4. Our organization usually contacts potential partners in a relaxed environment (i.e. dining out)</td>
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<td></td>
<td>5. Our organization has a systematic warning system that allows us to identify key developments in the environment and incorporate them quickly into the organization</td>
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<tr>
<td>Relationship management</td>
<td>1. Our organization carries out different activities (meetings, conferences, and workshops) in order to promote the exchange of knowledge and points of view with our main stakeholders</td>
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<td></td>
<td>2. Our organization jointly and correctly developed a cooperation agreement with our partners</td>
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<td>3. Our organization is committed to maintain long-term interaction and strong ties with our partners</td>
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<td>4. Our organization is able to work out constructive solutions when there is a conflict with our innovation partners</td>
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<td>5. Our organization adapts the allocation of tasks and resources continuously to meet the innovation network needs</td>
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<td></td>
<td>6. An administrative unit is developed to manage required resources and allocation of those resources to the partners in the innovation network</td>
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<tr>
<td>Knowledge absorption</td>
<td>Potential absorptive capacity</td>
<td>1. Our organization has invested in the internal activities of research and development to explore new knowledge and to improve products or services</td>
<td>Javier Donate &amp; Guadamillas, 2011; X. Liu et al., 2017; Yu et al., 2013; Berghman et al., 2013</td>
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<td></td>
<td>2. Our organization has formal procedures and practices to obtain new information and knowledge from outside of our organization</td>
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<td>3. Our organization regularly has special meetings with our partners (such as focus groups, and brainstorming) to discuss how to develop new products or services that may be needed in the future (Yu et al., 2013; X. Liu et al., 2017)</td>
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256
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<th>Sub-category</th>
<th>Determinant</th>
<th>Operationalization</th>
<th>Reference</th>
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<tbody>
<tr>
<td>Realized absorptive capacity</td>
<td>1. Our organization regularly evaluates and adjusts our long-term forecasts according to public management trends, technological developments, and other new knowledge</td>
<td>4. Our organization uses mechanisms that stimulate us to frequently discuss the assumptions that we have about citizens’ needs</td>
<td>Javier Donate &amp; Guadamillas, 2011; X. Liu et al., 2017; Yu et al., 2013; Berghman et al., 2013</td>
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<tr>
<td></td>
<td>2. Our organization has a systematic program applying new knowledge to develop and improve new products, processes, or services</td>
<td>5. Our organization uses mechanisms that stimulate us to frequently discuss the assumptions that we have about our products or services</td>
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<td></td>
<td>3. Our organization widely shares and digests the institutionalized routines among our employees and groups</td>
<td>6. Our organization uses mechanisms that stimulate us to keep alive the shared understanding about our citizens’ needs, products, or services</td>
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<td>4. Our organization has promoted databases that allow gathered knowledge and experiences to be used later available among employees</td>
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<td></td>
<td>5. Our organization uses mechanisms that stimulate us to adapt the organizational structure to better cater to the needs of a (planned) new offering</td>
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<td>6. Our organization uses mechanisms that stimulate us to replace our skills (competencies) to better cater to the needs of a (planned) new offering</td>
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<tr>
<td></td>
<td>7. Our organization uses mechanisms that stimulate employees to change our way of working to better cater to the needs of (planned) new offerings</td>
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<tr>
<td>Knowledge sharing</td>
<td>1. Our employees often share with their colleagues the new working skills that they learn</td>
<td>1. Our organization uses mechanisms that stimulate us to frequently discuss the assumptions that we have about citizens’ needs</td>
<td>Stelmaszczyk, 2020; GUNU &amp; AJAYI, 2015; Hsiu-Fen Lin, 2007</td>
</tr>
<tr>
<td>Knowledge donation</td>
<td>2. Our employees often share with their colleagues the new information that they acquire</td>
<td>2. Our organization uses mechanisms that stimulate us to frequently discuss the assumptions that we have about our products or services</td>
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</tr>
<tr>
<td>Learning orientation</td>
<td>3. Sharing knowledge with each other is regarded as normal in the organization</td>
<td>3. Our organization uses mechanisms that stimulate us to keep alive the shared understanding about our citizens’ needs, products, or services</td>
<td>Stelmaszczyk, 2020; GUNU &amp; AJAYI, 2015; Hsiu-Fen Lin, 2007; Podrug et al., 2017</td>
</tr>
<tr>
<td>Commitment to learn</td>
<td>1. Our employees often share with each other their working skills when they are asked for</td>
<td>4. The basic values of this organization include learning as the key to improvement</td>
<td>Calantone et al., 2002; Stelmaszczyk, 2020; J. Yang, 2012; GUNU &amp; AJAYI, 2015</td>
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<td>2. Our employees often share with each other the information when they are asked for</td>
<td>5. The sense around here is that employee learning is an investment, not an expense</td>
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<td>3. Our employees regularly meet in exchange for working skills, knowledge, and information they have in the projects</td>
<td>6. Learning in my organization is seen as a key commodity necessary to guarantee organizational survival</td>
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<tr>
<td>Shared vision</td>
<td>1. There is a commonality of purpose in our organization</td>
<td>1. Leaders basically agree that our organization’s ability to learn is the key to our improvement in capacity</td>
<td>Calantone et al., 2002; Stelmaszczyk, 2020; Ganguly et al., 2019</td>
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<td></td>
<td>2. There is a common language to support knowledge sharing between employees and departments to experiment and implement new ideas in their working day</td>
<td>2. Leaders believe that encouraging knowledge sharing with colleagues is beneficial</td>
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<td></td>
<td>3. There is total agreement on our organizational vision across all levels, functions, and divisions</td>
<td>3. Leaders provide necessary help and resources to enable employees to learn through training, acquire new knowledge, and share knowledge</td>
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<td></td>
<td>4. All employees are committed to the goals of this organization</td>
<td>4. The basic values of this organization include learning as the key to improvement</td>
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<tr>
<td></td>
<td></td>
<td>5. The sense around here is that employee learning is an investment, not an expense</td>
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<tr>
<td></td>
<td></td>
<td>6. Learning in my organization is seen as a key commodity necessary to guarantee organizational survival</td>
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| Open-mindedness | 5. Employees view themselves as partners in charting the direction of the organization | 1. Our employees are not afraid to reflect critically on the shared assumptions we have made about our citizens  
2. Our employees realize that the very way they perceive the public services or policies must be continually questioned  
3. Our organization often collectively questions our own bias about the way we interpret citizens’ information  
4. Our organization continually judges the quality of our decisions and activities taken over time Our employees are encouraged to “think outside of the box.” | Calantone et al., 2002; Stelmaszczyk, 2020 |
### B. Coding scheme

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<th>First level</th>
<th>Second level</th>
<th>Third level</th>
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</table>
| Resources   | Human resources | Level of employees’ knowledge and skills | 1. high education levels and specialized training  
2. highly skilled with professional experience  
3. specific competencies for innovation activities  
4. participation in training related to innovation |
|             | Diversity of employees’ knowledge and skills | 1. a heterogeneous academic education |
|             | Employees’ attitude and motivation | 1. enterprising and willing to take risks  
2. enjoy new idea generation  
3. enjoy solving challenging and complex problems  
4. enjoy improving existing services or processes |
|             | Human resource management | Hiring | 1. highly selective hiring processes  
2. selected based on their level of expertise and skills  
3. selected based on their future potentials |
|             | Training | 1. offer comprehensive training to employees  
2. frequently host formal training activities  
3. Training activities for problem-solving abilities and creativity  
4. resources spent on training |
|             | Performance and reward | 1. reward knowledge and experience sharing  
2. reward knowledge and skill development  
3. reward for new idea generation  
4. performance evaluation tolerates non-repetitive mistakes |
|             | Employee empowerment | 1. employees involved in the decision-making process  
2. delegation to the responsible employees  
3. employees’ suggestions are encouraged  
4. employees’ suggestions are valued and have potential influence |
|             | Financial resources | Availability of financial resources | 1. available funding is large  
2. have very little retained funding per year  
3. working capital is tight  
4. have a large amount of short-term investment  
5. different sources of funding  
6. stability of funding |
|             | Discretion of financial resources | 1. full authority to determine the usage of funding  
2. flexibility to change the usage of funding  
3. use funding for exploration of new direction not defined before |
|             | Information technology | IT for knowledge management | 1. IT for knowledge sharing and exchange  
2. IT for knowledge storage and access internally  
3. IT for employee collaboration on knowledge sharing  
4. IT for knowledge access for outside database  
5. IT for collecting user information  
6. IT for analyzing user information |
|             | IT for collaboration and interaction | 1. IT for connecting with external partners  
2. IT for interacting with users  
3. IT for coordinating with partners |
|             | Management | Leadership | 1. Leaders’ interests in innovation  
2. comfortable to take risks |
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<tr>
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<tr>
<td>commitment</td>
<td>3. committed to promote innovation activities in the organization 4. provide necessary support to employees conducting innovation</td>
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<tr>
<td>Leaders’ activities and skills</td>
<td>1. communicate importance of innovation across the organization 2. allocate funding and staff for exploration of new ideas 3. support human resource management oriented toward innovation 4. networking with people inside and outside organization for innovation</td>
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</tr>
<tr>
<td>Vision and strategy</td>
<td>Innovation strategy</td>
<td>1. strategy has a commitment toward innovation 2. policies and guidelines to different domains of innovation 3. an orientation toward new products or services</td>
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<tr>
<td>Strategic alignment</td>
<td>1. innovation strategy aligns with employee morale, and skills 2. alignment with external context</td>
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<tr>
<td>Ideation and organizational structure</td>
<td>Idea generation process</td>
<td>1. a clear way of processing and developing ideas 2. different techniques of creativity and idea generation 3. welcome ideas from different levels of employees 4. employees have available time and resources for idea generation 5. involves external partners for new ideas 6. feedbacks on idea generation through multicriteria feasibility</td>
<td></td>
</tr>
<tr>
<td>Decentralization</td>
<td>1. decisions made with all employees 2. employee’s opinions and knowledge are well communicated 3. wide latitude and flexibility in deciding means for tasks 4. frequent employee participation in decision making processes</td>
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</tr>
<tr>
<td>Organization culture</td>
<td>Innovative culture</td>
<td>1. emphasis on new services or administrative techniques and procedural changes 2. orientation toward searching for new opportunities of exploration 3. open mentality toward new opportunities and trends</td>
<td></td>
</tr>
<tr>
<td>Tolerance of mistake, failure, or risk</td>
<td>1. a strong proclivity for high-risk projects with great potentials 2. an aggressive posture to maximize the probability of potential opportunities 3. employee feel safe to undertake risky projects 4. employees feel safe to make mistakes and discuss them with colleagues</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Proactiveness</td>
<td>1. initiates changes that other agencies or departments follow or adopt 2. often the first to introduce new products or services 3. takes entrepreneurial opportunities to initiate new programs</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Citizen-orientation</td>
<td>1. frequently communicates citizens’ experiences across all members 2. frequently explore citizens’ needs of our services and products 3. survey citizens to assess the quality of our products and service 4. driven by citizens’ needs to develop new initiatives</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Collaboration</td>
<td>Intra-organizational collaboration</td>
<td>Cross-functional communication</td>
<td>1. employees have close relations with each other 2. employees frequently communicate with each other for problem solving 3. employees from different units frequently cooperate for problem solving</td>
</tr>
<tr>
<td>Collaboration with external partners</td>
<td>Inter-organizational collaboration</td>
<td>1. engages in formal and informal cooperation and exchanges with external partners 2. engages in a regular exchange of information, knowledge, and ideas 3. often partner with private companies 4. often partner with academic institutes 5. often partner with non-profit organizations 6. keep close relationship with external partners 7. often partner with international organizations</td>
<td></td>
</tr>
<tr>
<td>Collaboration with citizens/users</td>
<td>1. regularly share critical information with citizens 2. citizens are involved in the development of new products or services 3. regularly involve citizens in the reviewing and modification 4. regularly involve citizens in evaluating their needs 5. partner citizens in an interactive way to develop new products or services 6. partner with key citizens to overcome challenges in the innovation</td>
<td></td>
<td></td>
</tr>
<tr>
<td>First level</td>
<td>Second level</td>
<td>Third level</td>
<td>Fourth level</td>
</tr>
<tr>
<td>------------------</td>
<td>-----------------------</td>
<td>----------------------------------------------------------------------------</td>
<td>----------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Shared</td>
<td>motivation,</td>
<td>1. partners share the same ambitious and visions for innovation</td>
<td>1. partners share the same ambitious and visions for innovation</td>
</tr>
<tr>
<td></td>
<td>understanding, and</td>
<td>2. partners agree on the important aspects in the collaboration and innovation</td>
<td>2. partners agree on the important aspects in the collaboration and innovation</td>
</tr>
<tr>
<td></td>
<td>commitment</td>
<td>3. partners agree on the importance of collaboration for innovation</td>
<td>3. partners agree on the importance of collaboration for innovation</td>
</tr>
<tr>
<td></td>
<td></td>
<td>4. partners have the commitment to maintain collaboration and innovation</td>
<td>4. partners have the commitment to maintain collaboration and innovation</td>
</tr>
<tr>
<td>Trust</td>
<td></td>
<td>1. rely on the information partners have provided</td>
<td>1. rely on the information partners have provided</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2. rely on partners to solve difficulties at work</td>
<td>2. rely on partners to solve difficulties at work</td>
</tr>
<tr>
<td></td>
<td></td>
<td>3. partners treat us fairly</td>
<td>3. partners treat us fairly</td>
</tr>
<tr>
<td></td>
<td></td>
<td>4. partners treat us truthfully</td>
<td>4. partners treat us truthfully</td>
</tr>
<tr>
<td></td>
<td></td>
<td>5. partners are trustworthy in keeping the agreements or promises</td>
<td>5. partners are trustworthy in keeping the agreements or promises</td>
</tr>
<tr>
<td>Network</td>
<td>governance</td>
<td>1. spends time searching for external partners</td>
<td>1. spends time searching for external partners</td>
</tr>
<tr>
<td></td>
<td>Boundary-</td>
<td>2. find partners to provide complementary skills and knowledge</td>
<td>2. find partners to provide complementary skills and knowledge</td>
</tr>
<tr>
<td></td>
<td>spanning</td>
<td>3. frequently contact potential partners through multiple channels</td>
<td>3. frequently contact potential partners through multiple channels</td>
</tr>
<tr>
<td></td>
<td></td>
<td>4. contact potential partners in a relaxed environment</td>
<td>4. contact potential partners in a relaxed environment</td>
</tr>
<tr>
<td></td>
<td></td>
<td>5. identify key developments in the environment and incorporate them quickly</td>
<td>5. identify key developments in the environment and incorporate them quickly</td>
</tr>
<tr>
<td>Relationship</td>
<td>management</td>
<td>1. different activities for the exchange of knowledge</td>
<td>1. different activities for the exchange of knowledge</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2. a cooperation agreement with our partners</td>
<td>2. a cooperation agreement with our partners</td>
</tr>
<tr>
<td></td>
<td></td>
<td>3. committed to maintain a long-term interaction and strong tie</td>
<td>3. committed to maintain a long-term interaction and strong tie</td>
</tr>
<tr>
<td></td>
<td></td>
<td>4. constructively solve conflicts with partners</td>
<td>4. constructively solve conflicts with partners</td>
</tr>
<tr>
<td></td>
<td></td>
<td>5. adapts allocation of tasks and resources continuously</td>
<td>5. adapts allocation of tasks and resources continuously</td>
</tr>
<tr>
<td>Knowledge</td>
<td>and</td>
<td>1. internal activities of research and development to explore new knowledge</td>
<td>1. internal activities of research and development to explore new knowledge</td>
</tr>
<tr>
<td>Learning</td>
<td>Learning</td>
<td>2. formal procedures to obtain new knowledge from outside of our organization</td>
<td>2. formal procedures to obtain new knowledge from outside of our organization</td>
</tr>
<tr>
<td>Knowledge</td>
<td>absorption</td>
<td>3. regular activities with partners to develop new ideas</td>
<td>3. regular activities with partners to develop new ideas</td>
</tr>
<tr>
<td>Potential</td>
<td>absorptive</td>
<td>4. explore assumptions about citizens’ needs</td>
<td>4. explore assumptions about citizens’ needs</td>
</tr>
<tr>
<td>absorptive</td>
<td>capacity</td>
<td>5. explore assumptions about procedures or services</td>
<td>5. explore assumptions about procedures or services</td>
</tr>
<tr>
<td>capacity</td>
<td></td>
<td>6. keep alive the shared understanding and new assumptions</td>
<td>6. keep alive the shared understanding and new assumptions</td>
</tr>
<tr>
<td>Realized</td>
<td>absorptive</td>
<td>1. evaluate and adjust our existing knowledge and long-term forecasts</td>
<td>1. evaluate and adjust our existing knowledge and long-term forecasts</td>
</tr>
<tr>
<td>absorptive</td>
<td>capacity</td>
<td>2. mechanisms to apply new knowledge to develop and improve new products</td>
<td>2. mechanisms to apply new knowledge to develop and improve new products</td>
</tr>
<tr>
<td>capacity</td>
<td></td>
<td>3. widely shares and digests the institutionalized routines</td>
<td>3. widely shares and digests the institutionalized routines</td>
</tr>
<tr>
<td>Knowledge</td>
<td>sharing</td>
<td>1. share with each other the working skills when they are asked for</td>
<td>1. share with each other the working skills when they are asked for</td>
</tr>
<tr>
<td>Knowledge</td>
<td>collection</td>
<td>2. share with each other the information when they are asked for</td>
<td>2. share with each other the information when they are asked for</td>
</tr>
<tr>
<td></td>
<td></td>
<td>3. exchange of working skills, knowledge, and information they have in the project</td>
<td>3. exchange of working skills, knowledge, and information they have in the project</td>
</tr>
<tr>
<td>Knowledge</td>
<td>donation</td>
<td>1. share with their colleagues the new working skills that they learn</td>
<td>1. share with their colleagues the new working skills that they learn</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2. share with their colleagues the new information that they acquire</td>
<td>2. share with their colleagues the new information that they acquire</td>
</tr>
<tr>
<td></td>
<td></td>
<td>3. sharing knowledge with each other is regarded as normal</td>
<td>3. sharing knowledge with each other is regarded as normal</td>
</tr>
<tr>
<td>Learning</td>
<td>orientation</td>
<td>1. ability to learn is key to our organization</td>
<td>1. ability to learn is key to our organization</td>
</tr>
<tr>
<td></td>
<td>Commitment</td>
<td>2. encouraging knowledge sharing with colleagues is beneficial</td>
<td>2. encouraging knowledge sharing with colleagues is beneficial</td>
</tr>
<tr>
<td></td>
<td>to learn</td>
<td>3. provide necessary resources to enable employees to learn through training</td>
<td>3. provide necessary resources to enable employees to learn through training</td>
</tr>
<tr>
<td></td>
<td></td>
<td>4. learning is the key to improvement</td>
<td>4. learning is the key to improvement</td>
</tr>
<tr>
<td></td>
<td></td>
<td>5. learning is an investment, not an expense</td>
<td>5. learning is an investment, not an expense</td>
</tr>
<tr>
<td></td>
<td></td>
<td>6. learning is key to organizational survival</td>
<td>6. learning is key to organizational survival</td>
</tr>
<tr>
<td>Shared</td>
<td>vision</td>
<td>1. a commonality of purpose in our organization</td>
<td>1. a commonality of purpose in our organization</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2. a common language to support knowledge sharing and exploration</td>
<td>2. a common language to support knowledge sharing and exploration</td>
</tr>
<tr>
<td></td>
<td></td>
<td>3. agreement on our organizational vision</td>
<td>3. agreement on our organizational vision</td>
</tr>
<tr>
<td></td>
<td></td>
<td>4. employees committed to the goals of this organization</td>
<td>4. employees committed to the goals of this organization</td>
</tr>
<tr>
<td></td>
<td></td>
<td>5. employees as partners in charting the direction of the organization</td>
<td>5. employees as partners in charting the direction of the organization</td>
</tr>
<tr>
<td>Open-</td>
<td>mindedness</td>
<td>1. reflect critically on the shared assumptions about citizens</td>
<td>1. reflect critically on the shared assumptions about citizens</td>
</tr>
<tr>
<td>mindset</td>
<td></td>
<td>2. reflect critically on the assumption about products or services</td>
<td>2. reflect critically on the assumption about products or services</td>
</tr>
<tr>
<td>First level</td>
<td>Second level</td>
<td>Third level</td>
<td>Fourth level</td>
</tr>
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</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>3. questions our own bias about citizens’ needs and services</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>4. judges the quality of our decisions and activities taken over time</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>5. encourage to “think outside of the box.”</td>
</tr>
</tbody>
</table>
C. Interview protocol

INTERVIEW PROTOCOL

Enhancing Public Innovation Capacity in Local Governments: How can Innovation Labs Make a Contribution?

Principal Investigator: Qianli Yuan

Introduction
Good morning, my name is _______. This interview constitutes an important component of this project. It attempts to understand the contributions of innovation labs to government organizations’ innovation capacity.

I would like to thank you again for accepting this interview. This study will greatly benefit from your perspectives and opinions.

(The consent form will or has been provided to the interviewee) Before we begin the interview, I need to make sure you have had a chance to read this consent form.

(Allow time for reading) The purpose of this document is to inform you about your rights as a research participant. I ensure that all information will remain confidential and nothing you say will be attributed to you without your permission.

Do you have any questions? (Ask questions, if any)

Please keep this document for yourself.

If this is OK with you, I will start recoding the interview. Recording is very important because it gives me much more accurate notes than I can take by hand. As I said in my email, the interview will last approximately one hour.
### Interview Questions

#### General questions

1. **Before we start, can you tell me a little bit about your own background? (your education, work experience, etc.)**  

   prompts

2. **Could you tell me what is your current role and your major responsibilities in the innovation lab?**  

   prompts

#### Purpose and features of the innovation lab

1. **Can you tell me about the history of this lab?**  

   prompts

2. **What are the goals or purposes of this innovation lab?**  

   prompts

#### Innovation capacity

1. **What is your understanding of innovation capacity in an organization?**  
   How do you think the innovation lab has the innovation capacity?  
   What determines innovation capacity in your innovation lab?

   prompts  
   1. Resources  
   2. Management  
   3. Knowledge and learning  
   4. Collaboration

#### Resources
2. **What about the human resource in the lab? Do you think human resources influence the innovation capacity? If so, what specific aspects of human resources do you think influence the innovation capacity in your lab?**

| prompts | 1. What is the level of education and expertise of your staff? And how does the level of expertise and skills influence innovation capacity?  
2. How diverse are the skillsets of your staff? And how does the diversity influence innovation capacity?  
3. What are the staff’s attitude and motivation toward innovate? How does that influence innovation capacity?  
4. What are the hiring and training practices toward innovation? How does the hiring process influence the innovation capacity?  
5. How does your lab reward and/or empower staff? How does that influence innovation capacity? |

3. **What about the financial resources in the lab? Do you think financial resources influence the innovation capacity? If so, what specific aspects of financial resources do you think influence the innovation capacity in your lab?**

| prompts | 1. How available are the financial resources in the lab? And how does that influence the innovation capacity?  
2. What are the sources of the funding in the lab?  
3. How autonomy is the decision in spending those funding? And how does that influence the innovation capacity? |

4. **How are information technologies used in the lab? Do you think the use of information technology influence the innovation capacity? If so, what specific aspects of information technology do you think influence the innovation capacity in your lab?**

| prompts | 1. What are the ICTs used for knowledge management? How do the ICTs for knowledge management influence innovation capacity?  
2. What are the ICTs used for interaction among different actors? How do the ICTs for interaction influence innovation capacity?  
3. How is the level of ICT expertise and skills of your staff? |

**Management**

5. **What is your impression of the leaders in the innovation lab? Do you think the leaders influence the innovation capacity? If so, what specific aspects of leaders do you think influence the innovation capacity in your lab?**

| prompts | 1. What are the leadership style and traits in the lab? How does that style influence the innovation capacity?  
2. What are leaders’ attitude and commitment toward innovation? How does that attitude, or commitment influence the innovation capacity?  
3. What are specific actions those leaders do to influence the innovation capacity? |

6. **What is strategy of the innovation lab? Do you think the strategy influence the innovation capacity? If so, what specific aspects of the strategy do you think influence the innovation capacity in your lab?**

<p>| prompts | 1. What is the overall strategy in your lab to achieve changes or innovation in the local governments? |</p>
<table>
<thead>
<tr>
<th>prompts</th>
</tr>
</thead>
<tbody>
<tr>
<td>2. How is your innovation strategy aligning with overall strategy in the local government? And how does that influence your innovation capacity?</td>
</tr>
</tbody>
</table>

**7. How is the innovation lab structured? Do you think the structure influence the innovation capacity? If so, what specific aspects of the structure do you think influence the innovation capacity in your lab?**

<table>
<thead>
<tr>
<th>prompts</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. What is the process of idea generation in the lab? And how does this particular process influence the innovation capacity?</td>
</tr>
<tr>
<td>2. Is the innovation lab more centralized or decentralized? Why? How does the level of centralization influence the innovation capacity?</td>
</tr>
<tr>
<td>3. How does the lab communicate with different functions in the local governments?</td>
</tr>
</tbody>
</table>

**8. How would you describe the culture in the innovation lab? Do you think the culture influence the innovation capacity? If so, what specific aspects of the culture do you think influence the innovation capacity in your lab?**

<table>
<thead>
<tr>
<th>prompts</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. What is lab’s attitude toward risks, mistakes, or failure? And how does that influence the innovation capacity?</td>
</tr>
<tr>
<td>2. What is lab’s attitude toward change that influences innovation capacity?</td>
</tr>
<tr>
<td>3. Is there a citizen-oriented culture in the lab? And how does that influence the innovation capacity?</td>
</tr>
</tbody>
</table>

**Knowledge and learning**

**9. What are the practices of explore new knowledge in the lab? Do you think such practices influence the innovation capacity? If so, what specific practices of exploring new knowledge do you think influence the innovation capacity in your lab?**

<table>
<thead>
<tr>
<th>prompts</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. What are the practices for acquiring new knowledge and analyzing, discussing, and interpreting it in the lab? How do those practices influence the innovation capacity?</td>
</tr>
<tr>
<td>2. What are the practices for transforming existing knowledge with newly acquired knowledge and apply it in the lab? How do those practices influence the innovation capacity?</td>
</tr>
</tbody>
</table>

**10. What are the practices of knowledge sharing in the lab? Do you think such practices influence the innovation capacity? If so, what specific practices of knowledge sharing do you think influence the innovation capacity in your lab?**

<table>
<thead>
<tr>
<th>prompts</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. How often do you share your knowledge with your colleagues? And how does that influence the innovation capacity?</td>
</tr>
<tr>
<td>2. How often do you collect knowledge from your colleagues? And how does that influence the innovation capacity?</td>
</tr>
<tr>
<td>3. How is staff motivated to share knowledge that influences the innovation capacity?</td>
</tr>
</tbody>
</table>

**11. How is the staff’s attitude toward learning new knowledge in the lab? Do you think such attitude influence the innovation capacity? If so, what specific aspects of this attitude do you think influence the innovation capacity in your lab?**

<table>
<thead>
<tr>
<th>prompts</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. How committed is the lab’s staff to learning?</td>
</tr>
<tr>
<td>2. How is this commitment or vision to learning shared among staff in the lab?</td>
</tr>
<tr>
<td>3. How open-minded is the staff in the lab to renew and update knowledge?</td>
</tr>
</tbody>
</table>
Collaboration

<table>
<thead>
<tr>
<th>12. How does the lab collaborate across other agencies in the local government? Do you think the internal collaboration influence the innovation capacity? If so, what specific aspects of internal collaboration do you think influence innovation capacity in your lab?</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Prompts</strong></td>
</tr>
<tr>
<td>1. What are the connections built with other agencies? How do those connections influence the innovation capacity?</td>
</tr>
<tr>
<td>2. What are the socialization activities to build those connections? How do those socialization activities influence the innovation capacity?</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>13. How does the lab collaborate with actors outside the local government? Do you think the external collaboration influence the innovation capacity? If so, what specific aspects do you think influence innovation capacity in your lab?</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Prompts</strong></td>
</tr>
<tr>
<td>1. How does the lab collaborate with organizations (e.g., private companies, non-profit organizations, research institutes)? How do those relations with external partners influence the innovation capacity?</td>
</tr>
<tr>
<td>2. How does the lab involve or collaborate with citizens? How does the citizen involvement influence innovation capacity?</td>
</tr>
<tr>
<td>3. How does the lab build mutual trust among those actors? How does the mutual trust influence the innovation capacity?</td>
</tr>
<tr>
<td>4. How does the lab build a shared vision or commitment? How does the shared vision influence the innovation capacity?</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>14. What are the practices to manage those networks? Do you think the network management influence the innovation capacity? If so, what specific aspects of network management do you think influence innovation capacity in your lab?</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Prompts</strong></td>
</tr>
<tr>
<td>1. What are the practices of searching for new partners and connecting with them (boundary spanning)? And how do those practices influence the innovation capacity?</td>
</tr>
<tr>
<td>2. What are the practices to manage the relationship with those actors? How do those practices of relationship management influence the innovation capacity?</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>15. What are other determinants of innovation capacity you think important but not mentioned in the above questions?</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Prompts</strong></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>16. You have shared practices in different areas that you think result in increased innovation capacity. What challenges have you experience when implementing these practices?</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Prompts</strong></td>
</tr>
</tbody>
</table>
### Innovation performance

**1.** Generally speaking, how do you measure success of the innovation lab? What are the main results or achievements of the innovation projects in the innovation lab?

<table>
<thead>
<tr>
<th>prompts</th>
<th>1. Could you give me some examples?</th>
</tr>
</thead>
</table>

**2.** If you think of our previous discussion about determinants of innovation capacity, how have these determinants influence the success of the projects you have just talked about?

| prompts | 1. How does the lab’s capacity influence the number of the innovations developed?  
2. How does the lab’s capacity influence the novelty of the innovations developed?  
3. How does the lab’s capacity influence the effectiveness, efficiency, or equity of public management? |
|---------|--------------------------------------------------------------------------------|

### Transfer innovation capacity

**1.** Do you think that the existence of this innovation lab has resulted in increased innovation capacity in the rest of the organization? Why or why not?

| prompts | |
|---------||

**2.** How has the transfer of innovation capacity from the lab to the rest of the organization happened?

| prompts | |
|---------||

**3.** What are some of the challenges that the local government and the innovation lab has encountered in the transfer process?

| prompts | |
|---------||

**4.** What has been done to address those challenges?

| prompts | |
|---------||

### Innovation lab in the future
1. In general, what are the areas/elements the lab planning to invest more in the future to increase its own innovation capacity?

<table>
<thead>
<tr>
<th>prompts</th>
</tr>
</thead>
<tbody>
<tr>
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</tbody>
</table>

2. What do you think the role of the innovation lab to further increase innovation capacity in the rest of the local government?

<table>
<thead>
<tr>
<th>prompts</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Do you think the innovation lab will engage more with the implementation?</td>
</tr>
<tr>
<td>2. Do you think the innovation lab is good with its current role in the front-end?</td>
</tr>
</tbody>
</table>

End/Thanks

1. Would it be OK to follow up and clarify a few things with you in the future if necessary?
2. Thank you very much for your time.
D. Staff’s educational and professional background in the three innovation labs

D1. MONUM’s staff educational and professional background

<table>
<thead>
<tr>
<th>Staff name</th>
<th>Highest degree</th>
<th>Degree in</th>
<th>Professional experience (prior to MONUM)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Staff one</td>
<td>Doctoral</td>
<td>Computer Science</td>
<td>Technology start-ups; Urban Technologist</td>
</tr>
<tr>
<td>Staff two</td>
<td>Master</td>
<td>Urban Design</td>
<td>Director of Boston’s bicycle program; Non-profits</td>
</tr>
<tr>
<td>Staff three</td>
<td>Doctoral</td>
<td>Sociology</td>
<td>Organizational Equity Practice Manager in Trinity Boston Foundation</td>
</tr>
<tr>
<td>Staff four</td>
<td>Bachelor</td>
<td>Literature</td>
<td>Non-profits in education; Teaching</td>
</tr>
<tr>
<td>Staff five</td>
<td>Master</td>
<td>Urban Design</td>
<td>Freelance designer and public artist</td>
</tr>
<tr>
<td>Staff six</td>
<td>Bachelor</td>
<td>Physical Chemistry</td>
<td>Design Technologist in Stamen; Code for America</td>
</tr>
<tr>
<td>Staff seven</td>
<td>Master</td>
<td>Urban and Housing Design</td>
<td>Architectural designer at Stull &amp; Lee, Inc; Madison Park Development Corporation</td>
</tr>
<tr>
<td>Staff eight</td>
<td>Master</td>
<td>City Planning and Development</td>
<td>Urban planner at Sasaki; Creative project manager in Google</td>
</tr>
<tr>
<td>Staff nine</td>
<td>Bachelor</td>
<td>Political Science</td>
<td>Research Director in Massachusetts Democratic Party; Campaign organizer</td>
</tr>
<tr>
<td>Staff ten</td>
<td>Bachelor</td>
<td>Political Science</td>
<td>Senior Analyst in Next Street;</td>
</tr>
</tbody>
</table>
### D2. Seattle IP’s staff educational and professional background

<table>
<thead>
<tr>
<th>Staff name</th>
<th>Highest degree</th>
<th>Degree in</th>
<th>Professional experience (prior to Seattle IP)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Staff one</td>
<td>Master</td>
<td>Urban Policy and Planning</td>
<td>Senior manager in Accenture Management Consulting; Advisor in NYC Office of the Mayor</td>
</tr>
<tr>
<td>Staff two</td>
<td>Master</td>
<td>Environmental Health and Public Administration</td>
<td>Environmental scientist in Haley &amp; Aldrich</td>
</tr>
<tr>
<td>Staff three</td>
<td>Master</td>
<td>Human-centered design and engineering</td>
<td>Design program manager in Artefact; Project manager in Twitter</td>
</tr>
<tr>
<td>Staff four</td>
<td>Bachelor</td>
<td>Project management certificate</td>
<td>Operation manager in Seattle Foundation</td>
</tr>
<tr>
<td>Staff five</td>
<td>Master</td>
<td>Data Science; Public Affairs</td>
<td>Associate Director in Social Finance; Associate in Investment Banking</td>
</tr>
<tr>
<td>Staff six</td>
<td>Bachelor</td>
<td>A series of certificates in Data Science</td>
<td>N/A</td>
</tr>
<tr>
<td>Staff seven</td>
<td>Master</td>
<td>Public Administration</td>
<td>International Community Health Services</td>
</tr>
<tr>
<td>Staff eight</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
</tr>
</tbody>
</table>
### D3. Minneapolis OPI's staff educational and professional background

<table>
<thead>
<tr>
<th>Staff name</th>
<th>Highest degree</th>
<th>Degree in</th>
<th>Professional experience (prior to Minneapolis OPI)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Staff One</td>
<td>Bachelor</td>
<td>Government</td>
<td>Founder &amp; Chief Executive Officer at Fortis Capital MN; Institute on Culture and Policy</td>
</tr>
<tr>
<td>Staff Two</td>
<td>Master</td>
<td>Public Administration</td>
<td>Assistant to the City Administrator, City of Woodbury; Prince George’s County Council Fellow</td>
</tr>
<tr>
<td>Staff Three</td>
<td>Master</td>
<td>Public Health</td>
<td>Grant Manager, State of Minnesota, Office of Justice Programs; Health Educator; Loan Document Specialist</td>
</tr>
<tr>
<td>Staff Four</td>
<td>Master</td>
<td>Public Policy</td>
<td>Program Evaluation Researcher, Health &amp; Wellness Administration, Ramsey County; Urban Partnership Communications Associate</td>
</tr>
<tr>
<td>Staff Five</td>
<td>Master</td>
<td>Public Policy</td>
<td>Co-Founder, Free Machine; Summer Fellow, Mayor’s Office of New Urban Mechanics</td>
</tr>
</tbody>
</table>
### E. Collaboration partners in the three innovation labs

#### E1. MONUM’s internal collaboration with other city agencies

<table>
<thead>
<tr>
<th>Project name</th>
<th>Internal city agencies collaborated</th>
</tr>
</thead>
<tbody>
<tr>
<td>Additional Dwelling Units</td>
<td>The Landmarks Commission&lt;br&gt;Department of Neighborhood Development&lt;br&gt;Boston Planning &amp; Development Agency&lt;br&gt;Inspectional Services Department&lt;br&gt;Environment</td>
</tr>
<tr>
<td>Compact Living Pilot</td>
<td>Department of Neighborhood and Development&lt;br&gt;Department of Transportation&lt;br&gt;Inspectional Services Development&lt;br&gt;Planning and Development Agency</td>
</tr>
<tr>
<td>Beta Blocks and Smart Streets</td>
<td>Department of Transportation&lt;br&gt;Department of Innovation and Technology&lt;br&gt;Department of Public Works</td>
</tr>
<tr>
<td>Autonomous Vehicles: Boston’s Approach</td>
<td>Department of Transportation</td>
</tr>
<tr>
<td>Pick-Up And Drop-Off Pilot for Passenger Cars</td>
<td>Department of Transportation&lt;br&gt;Analytical Team</td>
</tr>
<tr>
<td>Housing With Public Assets</td>
<td>Boston Public Library&lt;br&gt;Fire operations&lt;br&gt;Planning and Development Agency&lt;br&gt;Department of Neighborhood Development&lt;br&gt;Department of Property Management&lt;br&gt;Public Health Commission&lt;br&gt;Department of Public Works&lt;br&gt;Department of Transportation</td>
</tr>
</tbody>
</table>
## E2. MONUM’s collaboration with external partners

<table>
<thead>
<tr>
<th>Project name</th>
<th>Academic institute</th>
<th>Non-profit organization</th>
<th>Private company</th>
</tr>
</thead>
<tbody>
<tr>
<td>Additional Dwelling Units</td>
<td>MIT Real Estate Innovation Lab</td>
<td>Boston Society of Architects, BSA Foundation</td>
<td></td>
</tr>
<tr>
<td>Compact Living Pilot</td>
<td>MIT Real Estate Innovation Lab</td>
<td>Boston Society of Architects, What’s In Garrison Trotter Neighborhood Association (GTNA)</td>
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</tr>
<tr>
<td>Beta Blocks and Smart Streets</td>
<td>Emerson College, MIT Media Lab</td>
<td>The Trustees of Reservation</td>
<td>TD Bank</td>
</tr>
<tr>
<td>Triple Decker Design</td>
<td>Wentworth Institute of Technology, MIT Media Lab</td>
<td>Boston Society of Architects, Boston Architectural College</td>
<td>Local Voices Network</td>
</tr>
<tr>
<td>Autonomous Vehicles: Boston’s Approach</td>
<td></td>
<td></td>
<td>Optimus Ride Motional</td>
</tr>
<tr>
<td>Boston Food Access Network</td>
<td></td>
<td>18 Community Based Organizations that serve immigrant residents</td>
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</tr>
<tr>
<td>Digital Transparency in the Public Realm (DTPR)</td>
<td>Harvard Cyberlaw Clinic, Brandeis University</td>
<td></td>
<td></td>
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</tbody>
</table>
### E3. Seattle IP’s internal collaboration with other city agencies

<table>
<thead>
<tr>
<th>Project name</th>
<th>Internal city agencies collaborated</th>
</tr>
</thead>
</table>
| City affordability programs | Department of Education and Early Learning  
                              | Seattle Department of Transportation  
                              | Seattle IT  
                              | Seattle Parks and Recreation |
| COVID-19 testing           | Seattle Fire Department  
                              | Seattle IT |
| Creative Youth Development | Office of Arts and Culture  
                              | Office of Economic Development  
                              | Mayor’s Office Policy Team |
| FireSTAT                  | Seattle Fire Department  
                              | Seattle IT |
| TNC Driver Outreach       | Department of Neighborhoods  
                              | Finance & Administrative Services  
                              | Office of Immigrant & Refugee Affairs  
                              | Office of Labor Standards |
| UDP Self-Certification    | Human Services Department  
                              | Seattle City Light  
                              | Seattle Public Utilities |
## E4. Seattle IP’s collaboration with external partners

<table>
<thead>
<tr>
<th>Project name</th>
<th>Academic institute</th>
<th>Non-profit organization</th>
<th>Private company</th>
</tr>
</thead>
<tbody>
<tr>
<td>City affordability programs</td>
<td>University of Washington</td>
<td>U.S. Digital Response</td>
<td>Expedia Group</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>F5</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Tableau</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Google.org</td>
</tr>
<tr>
<td>COVID-19 testing</td>
<td>University of Washington</td>
<td>U.S. Digital Response</td>
<td>Solv Health</td>
</tr>
<tr>
<td>Food Rescue</td>
<td></td>
<td></td>
<td>Amazon</td>
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<tr>
<td>Racial Equity</td>
<td></td>
<td></td>
<td>Tableau</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Zillow</td>
</tr>
<tr>
<td>Predictive Analytics for Parking</td>
<td></td>
<td></td>
<td>Google</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>SoftServe</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Expedia</td>
</tr>
<tr>
<td>Creative Economy Collaboration</td>
<td></td>
<td></td>
<td>Facebook</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Twitter</td>
</tr>
<tr>
<td>Earthquake Early Warning</td>
<td></td>
<td></td>
<td>Amazon</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Twitter</td>
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<tr>
<td>Earthquake Damage Assessment</td>
<td></td>
<td></td>
<td>Amazon</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Twitter</td>
</tr>
<tr>
<td>NavApp 2.0</td>
<td></td>
<td></td>
<td>Microsoft</td>
</tr>
<tr>
<td>Youth Opportunity Portal</td>
<td></td>
<td></td>
<td>Microsoft</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Facebook</td>
</tr>
</tbody>
</table>
## E5. Minneapolis OPI’s internal collaboration with other city agencies

<table>
<thead>
<tr>
<th>Project name</th>
<th>Internal city agencies collaborated</th>
</tr>
</thead>
</table>
| Performance Management Metrics | All 22 city government agencies, including Health Department  
|                             | Fire Department  
|                             | Regulatory Services  
|                             | Human Resources   |
| Behavioral Crisis Response | Office of Violence Prevention  
|                             | Minneapolis Police Department  
|                             | Public Health & Safety Committee  
|                             | Minneapolis 311  
|                             | Minneapolis Health Department  
|                             | City Coordinator’s Office Evaluation and Performance |
| Re-imagine Public Safety   | Office of Violence Prevention  
|                             | Minneapolis Police Department  
|                             | Public Health & Safety Committee   |
| Small Business Assistance  | Community Planning & Economic Development  
|                             | Minneapolis Information and Technology Department |