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All for One or One for All:
Exploring the Interpretations of Co-Creation in Public Sector Innovation Labs

Master Thesis

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Abbreviations

BC	British Columbia
ICT	Information and Communication Technologies
IPA	Interpretative Phenomenological Analysis
NPM	New Public Management
PSI	Public Sector Innovaiton
PSIL	Public Sector Innovation Lab
R&D	Research and Development

Acknowledgements

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1 Introduction

In today's rapidly evolving world, the public sector is faced by a multitude of challenges that are driven by resource limitations and coupled with the rising expectations for the quality and accessibility of publicly provided services (Bland et al. 2010; Agger and Lund 2017). Traditional approaches to public service provision, public policy and service delivery often fall short in effectively addressing the increasingly complex problems faced by communities (Mueller 2020). This growing need for novel processes, solutions, and strategies to meet the growing demands and challenges within the public sector has prompted the emergence of public-sector innovation as a crucial area of focus for administrations over the past decade (Sørensen and Torfing 2011; Head 2018; McGann et al. 2018).

There is a growing realization and wide acceptance that innovation has capacity to address complex societal challenges as well as streamline public service delivery (Sørensen and Torfing 2011). Public sector organizations, managers as well as citizens are widely starting to acknowledge the significance of innovation (Bekkers and Tummers 2018). Alves 2013 describes innovation in the public sector as the generation and integration of novel ideas and approaches to yield societal value (Alves 2013).

One means to achieving governments' innovation efforts and addressing the complex societal challenges of the modern society, is weaving social perspectives after establishing a comprehensive consideration and understanding of the sociological attributes to innovation. Which as a result, will yield a socio-innovation that is society centric and better adapted to the complexity of these challenges (Yousefikhah 2017). Sociology literature lends a unique perspective to the social dimensions of modern day's complex challenges by suggestinig that social interpretations shape innovation process and thus enables the exploration and deciphering of these interpretations in depth (Hill 2010).

In response to the growing need for collaboration driven innovation and transformation within the public sector, a number of governments have established Public Sector Innovation Labs (PSIL) to employ collaborative and user centric processes such as co-creation, systemic design, and experimentation to drive change. PSILs also serve as protecting spaces for innovation within the public sector as they operate differently (Cole 2022). The establishment of PSIL signals a departure from traditional models of public service provision and the advancement of inclusive and participatory approaches in addressing the growing challenges facing the public sector.

As with PSIL, Co-creation also replaces traditional operations and processes within the public sector by introducing collaborative practices and multi-actor involvement, challenging the prexisting monopolies (Torfing et al. 2019). The concept of co-creation is considered an innovative approach to engagement and collaboration with various actors (Phi and Dredge 2019). As an approach, it is suited to address the multitude of complew challenges that face the public sector (Torfing et al. 2019).

In public sector innovation literature, co-creation has garnered recognition by many scholars such as Bason (2010) and Alves (2013) - who advocate for co-creation to be positioned as primary means to meet and overcome these complex challenges ahead of government. As such, the public sector's adoption of collaborative practices such as co-production and co-creation have been labeled as innovation (Criado et al. 2021).

Another shift from the traditional model of public sector is the concept of collaborative leadership. It is described by Jukić et al. 2022 as the departure from public service provisions and traditional notions of leadership. Bason (2018) emphasizes the role of collaborative leadership in facilitating the adoption of new initiatives and innovation. A notion which built on Vannoy and Salam (2010)'s argument that there is a significant influence that managers, as leaders, have on the perceived reality of other organizational members.

1.1 Problem Identification

The deficiencies surrounding the comprehension of innovation processes, may pose a significant impediment to its advancement (Carstensen and Bason 2012). Despite the increasing in their presence, innovation labs and PSIL, have only garnered limited scholarly attention (Tõnurist et al. 2015; McGann et al. 2018).

The dearth of agreement and the lack of solid conceptual boundaries of the concept of co-creation hinders the advancement of its scholarship (Matamala and Soler-Vilageliu 2022; Stock and Boyer 2009). A critical challenge to co-creation research is the lack of a agreement on the definition of the concept. Despite the existence of multiple defitions, this fragmentaion causes confusion of the term co-creation with other terms such as co-production or co-design and obstructs the formation of a unified body of research on it (Sarasvuo et al. 2022). As a result, the maturation of research in this domain remains a challenge (Sarasvuo et al. 2022).

Within the organizational context, interpretations of concepts may diverge among various actors. Nicolai and Dautwiz (2010) have substantiated this phenomena by scrutinizing the heterogeneous interpretations of core competencies within organizations. Their findings

propose that ambiguity emanates from both the conceptual obscurity inherent in the original text and the context-driven ambiguity within the adopting organization (Nicolai and Dautwiz 2010). Moreover, Ansell and Gash (2007) posit that the foundational conditions of participatory environments are inherently malleable, making them susceptible to disparities in interest and expertise.

Co-creation efforts are, therefore, shaped by a multitude of interests, knowledge levels, and varying power dynamics among stakeholders (Ansell and Gash 2007). One factor is the absence of a shared language and interpretation of concepts within organizations which may result in misinterpretations (Nicolai and Dautwiz 2010; Nielsen et al. 2019).

The comprehension of these multiple interpretations and how they may influence the initial conditions, and the outcomes of co-creation processes is key. Nielsen et al. (2019) argue that mitigating the multiplicity of interpretations of a concept within an organization is necessary to ensure that stakeholders maintain a unified perception of the objectives

The presence of conceptual ambiguity posits a challenge for the maturation of aresearch domain, especially in the foundational early stages of the research stream (Phi and Dredge 2019). The field of co-creation and its literature is surrounded by a multitude of perspectives and numerous concepts that hinder the development of a clear definition of the concept. Moreover, the diversity and disparity surrounding the concept eventually risk its development (Sarasvuo et al. 2022).

Hence, it is deemed crucial to establish a baseline for the conceptual alignment of concepts, in order to avoid their misinterpretation by various stakeholders (Mahmoud et al. 2021).

Along with the limited conceptual clarity of co-creation, there exists a lack of comprehensive research on the functioning and specific challenges of co-creation and relevant concepts such as co-design, and co-production. And that further challenges researchers in this field. This challenge may be further exacerbated when combined with the limited scholarly consideration of public sector innovation labs (PSIL) - the organizations where co-creation and collaborative practices are embedded and take place (Tõnurist et al. 2015; McGann et al. 2018). Hence, it is challenging for researchers to understand examine co-creation within the context of public sector innovation labs.

In conclusion, there is an intertwined complexity of studying co-creation within the public sector innovation lab context stemming from the lack of clear definition of co-creation and limited scholarly consideration of the latter. However, the growing uptake of

innovation in the public sector motivates the researchers interested in the field of public sector innovation to further delve and contribute to the inquiry of co-creation in PSIL.

1.2 Motivation

The significance of collaborative practices in public sector innovation, combined with the novelty and scarcity of inquiry into co-creation within the context of public sector innovation labs, have spurred the researcher's interest to further investigate this unique area of research.

Along with the aforementioned problems such as limited clarity of the concept of co-creation, the existence of multitude of interpretations, and the lack of understanding of the challenges associated with its implementation; this research further drew on the following points in the formulation of the research questions and scope:

1) Jukić et al. 2022 emphasis on leaders' collaborative leadership who take the role of advocates of co-creation and introduce this concept within the system.

2) Bason (2018)'s emphasis on collaborative leadership's role in facilitating the adoption of innovation.

3) The significant impact of leaders' perceptions of reality on how other members perceive reality (Vannoy and Salam 2010).

This research aims to explore and answer the following research questions:

Main Research Questions:

1.How do the interpretations of co-creation by leaders in public sector innovation labs influence the implementation of co-creation?

2.What perceived barriers in the wider context, as identified by leaders in public sector innovation labs, impact their interpretations and implementation of co-creation?

Sub-Research Question:

2.1 What are the key requirements or resources that leaders in public sector innovation labs identify as necessary to overcome the perceived barriers and enhance the implementation of co-creation?

1.3 Thesis Structure

The upcoming sections of this research will explore and build on relevant areas of knowledge to the introduced research questions above. Section 2 an extensive literature review covering the topics of innovation, public sector innovation labs, and co-creation. Section 2 concludes with a research gaps subsection 2.7 titled Gaps in Literature.

Thereafter, Section 3 presents the Social Construction of Technology Framework and relates it to the scope of study by concluding Table 3 : Aligning Research Questions and SCOT Elements.

Section 4 is dedicated to the outlining of Theoretical Framework, which is the backbone of this research. Section 5 presents the Findings of this research, followed by Section 6 Discussion of these findings and relating them to research questions. And lastly, in Section 7 Conclusion and suggestions for future research are presented.

2 Literature Review

This literature review chapter aims to provide a comprehensive review of the literature related to exploring co-creation in public sector innovation labs. In order to delve into the topic further, interdisciplinary literature from the intersection of the fields of sociology, innovation, and public administration was examined.

The chapter is divided into four main sections: the first section is the interplay of sociology and innovation and technology, the second section public sector innovation labs, and the third section explores the concept of co-creation. The fourth section presents the overall gaps in literature. Each section is further divided into thematic sub-sections. By delving into these areas, this chapter's objective is to establish a solid foundation for the subsequent analysis and findings.

2.1 Significance of Innovation

Innovation in the public sector has increasingly drawn attention for its significance as means to meet societal needs and improve public service delivery (Podger 2015). It has become a key subject of focus for researchers and practitioners as a result of the growing wide acceptance in innovation's capacity to improve the quality of public services and build up governmental organizations' resilience to societal challenges (Damanpour and Schneider 2009).

Albury (2005) has described innovation as not just a "luxury," but a "core necessity", that needs to be deeply entrenched in the realm of the public sector. The impetus for this stance arises from the inherent defeciencies of traditional, standardized service approaches in meeting to a society diverse and complex needs.

With growing pressures for efficiency, improved performance, and greater responsiveness, innovation has emerged as a means to meeting the diverse needs of individuals and communities. It has become a recurring theme in discourses around public service improvement, with the aim of fostering desirable societal outcomes (Albury 2005).

This rise in the importance of public sector innovation is reflected in scholarly and practitioner discourse alike. The term "public sector innovation" has been increasingly utilized in literature, attracting considerable attention from both scholars and practitioners (De Vries et al. 2016; Bekkers and Tummers 2018; Bommert 2010; Torfing 2013; Agger and Lund 2017).

There is a growing necessity for public sector organizations to foster a culture of innovation, and to equip public service managers and professionals with the requisite skills, opportunities, and motivation to innovate effectively and successfully. Thus, innovation shifts from being an optional “luxury” to a deeply rooted core value within the strategies and operations of public service organizations (Albury 2005).

While the role of information and communication technologies (ICTs) in fostering innovation is prevalent, innovation in the public sector is not solely confined to ICTs (Hofisi 2018). The scope of public sector innovation extends far beyond, encompassing an array of strategic, organizational, and procedural changes that collectively seek to improve public service delivery and societal outcomes. Commonly, innovation in the public sector is associated with organizational and structural reform initiatives such as New Public Management (NPM) (Damanpour and Schneider 2009).

2.2 Domains of Innovation

The upcoming subsections present innovation through the sociological perspective and expands on the domains of innovation studies by drawing particular attention to the dynamics within public and private sectors. Additionally, while innovation is frequently associated with technological advancements (Fuggetta 2014), Section 2.2.1 explored both technological and non-technological facets of innovation.

It is worth noting that the term "innovation" within an organizational framework is frequently linked with private sector entities. These entities are commonly considered to have superior agility in reacting to societal demands, modifying their strategies, and welcoming transformation compared to government institutions or non-profits (Gibson 2015).

Nevertheless, the presumption that public organizations are less capable of innovation than private corporations may be contested. There's evidence that suggest that innovations and innovative practices have consistently been present in public organization as well (Fuglsang and Pedersen 2011). Setnikar Cankar and Petkovsek (2013) argue that innovation within the public sector can be seen as parallel to, and at times, nearly indistinguishable from innovation within the private sector.

2.2.1 Sociology of Innovation

Studying innovation from the context of sociology could offer a valuable means to merge sociological analysis with the organizational process innovation and technological innovation. (Hill 2010). According to (Vannoy and Salam 2010), organizations are

"socially constructed systems of shared meaning". Hence, they suggest that interpretive sociology provides a foundation for examining organizations.

One of the key drivers for formulating and implementing innovative approaches is to address societal issues that are rooted in social considerations (Dawson and Daniel 2010). The crucial sociological understanding - that social organizations impacts behavior - can clarify innovation at various levels and phases of the innovation process. Moreover, it can serve as the foundational element of a system for incorporating more comprehensive sociological literature on the components of innovation. (Hill 2010).

The sociological perspective on innovation addresses this gap by highlighting the importance of social context in determining innovative outcomes. This approach emphasizes the role of structural arrangements, such as social networks, organizations, and institutions, in influencing innovation. It also recognizes that the perceptions of innovation are subjective and may vary depending on the individuals (Dahlin 2014).

2.2.2 The Interplay of Sociology, Innovation, and Technology

In sociology, single specific definitions of innovation are uncommon. The early few definitions vary greatly. They all converge at novelty as a core concept, but they vary in the act and in application of innovation itself (Godin 2008).

According to Daniel and Klein 2014, in a broad sense, the definition of innovation is still vague. Godin (2008), presents the interpretations of the term innovation over a timespan in different disciplines. One of the perspectives on innovation that Godin 2008 investigates is from the field of sociology, which is one of the elements of focus of this research.

Godin (2008), presents several prominent definitions of innovation from sociological work. Godin refers to Hart (1931)'s definition which describes innovation as the process of making unique modifications by combining material and socio-psychological aspects of culture. He also refers to Ogburn (1941) as he defines it as inventions that have had a profound influence on the surrounding environment. And lastly, he presents Rogers (1962) definition who characterizes innovation as an idea, procedure, or object that is perceived as new by the individual receiving it.

Hill (2010) advocates for applying the sociological perspective to investigate how social structures impact the process and outcomes of innovation. Dahlin (2014), emphasizes that examining the sociology of innovation enables the examination of its character. Moreover, it further allows the understanding of the dynamics of social networks, institutions, and organizations that influence innovation. Consequently, this emphasizes

the significance of societal considerations for organizations that are involved in technological innovation (Yousefikhah 2017).

2.2.3 Private Sector and Public Sector Innovation

There is a growing adoption of innovation in the public sector - which may take place as more systematic efforts to streameline the delivery of the high volume of services and as support in tackling the economic and societal challenges that public sectors face (Borins 2001; Koch and Hauknes 2005).

Private sector organizations are driven by profit generation, competition, market expansion, growth, problem-solving, and public image (Cankar and Petkovsek 2013).The motivation for adopting innovation varies between the public and private sectors. In the public sector, personal goals such as career advancement, idealism, recognition, power, self-actualization, and financial gain may drive individuals (Bloch 2011). On the other hand, public servants may be motivated by policy dissemination and public image. It is worth noting that similar to the private sector employees, public servants may also be motivated to innovate for professional development, personal growth, financial gain, job security (Thenint 2010).

Both the public and private sectors have a vital part to play in the adoption and upscaling of innovation - whether it is by creating coherent strategies to innovation on the national level for governments or at the organization level for the private sector (Cankar and Petkovsek 2013). The private sector has been a prominent leader in technology innovation, with innovative websites and engaging content. Yet, when it comes to large scale innovations such as privacy policies, streamlined access to health care, the public sector stands out as privacy and public safety are priorities for the public sector (West and Lu 2009).

The public sector is distinct from the private sector in terms of innovation, given the perception that the public sector provides a regulatory framework for innovation in the private sector and as a passive recipient of innovation from the private sector (Windrum 2008). Roolaht (2013) drew a comparison on the use of innovation in the private sector versus the public sector . The comparison highlighted how innovation applies in the two different spheres of application, given the significant difference in viewpoints for each sector. For instance, in terms of principal goals, the private sector is focused on profit and the public sector is focsed on its policy implementation and the general public.

2.2.4 Technological and Non-Technological Innovation

For over three decades, innovation has emerged as a synonymous term for technological advancement. Nowadays, innovation is not solely characterized by the mere act of generating novel ideas or technology products, but rather it serves a diverse array of applications (Kotsemir et al. 2013).

Innovation can be defined as the adoption of a new concept, practice, system, policy, programs, equipment, processes, products, or services within an organization (Damanpour 1992). This could be a combination of technology and organizational change. Improvement in products and processes is a technology innovation, while changes in marketing strategies, management techniques or organization structures are part of organizational innovation (Mothe and Uyen Nguyen Thi 2010).

Although there have been varying viewpoints in the literature regarding the classification of innovation in different sectors over the past few decades, a general agreement has been established regarding its flexibility as it encompasses both technical (novel products and processes) and non-technical (innovative services and processes) aspects (Armbruster et al. 2008).

2.3 Organizations of Innovation

Innovation centric organizations are entities that formalize the necessary components for housing and fostering innovation through creating roles, processes and practices for the purpose of innovation (Galbraith, 1982). Innovation has been a subject of interest in various disciplines, and it has been defined and studied from different perspectives (Damanpour and Wischnevsky, 2006). This multidisciplinary approach highlights the importance of examining innovation within the contexts of organizational behavior, management, and strategy.

In the reviewed literature, there are different definitions and perspectives on innovation within organizations. Damanpour and Wischnevsky (2006)’s research on innovation in organizations distinguishes between innovation-generating and innovation-adopting organizations.

According to Damanpour and Wischnevsky, (2006), innovation-generating organizations focus on developing and implementing new ideas or behaviors, encompassing new products, services, production methods (technical innovation), as well as new markets, organizational structures, or administrative systems (administrative or organizational innovation).

The generation of innovation aims to contribute to the organization's effectiveness and competitiveness by creating or utilizing new opportunities. While the adoption of innovation builds resilience and readiness to the ever-changing external conditions through maintaining effectiveness and competitiveness (Damanpour and Wischnevsky 2006).

According to Tang (1998), innovation in organizations is primarily executed through projects aimed at promoting or utilizing innovative products, processes, or services. Tang (1998)'s findings on the innovation process emphasizes the project-based nature of innovation initiatives and the need for these projects to be managed and executed effectively.

In public sector organizations, there is a growing emphasis on replicating proven industry practices to achieve better results. And as such, public sector organizations are adopting approaches and techniques that have proven to be innovation catalysts in private sector companies, such as providing maker spaces, hosting challenges and events, and promoting networking (Brunelle et al., 2020). As part of this transformation, new positions such as chief management officer, chief data officer, and chief innovation officer are becoming more common in the government as with the private sector (Brunelle et al., 2020).

The creation of these positions highlight the public sector's recognition of the importance of innovation and the need for dedicated leadership roles to drive and oversee innovation efforts within government agencies. Along with the creation of new roles, public sector organizations are establishing new dedicated offices or organizations to the acceleration of innovation (Brunelle et al., 2020).

All of which aim to foster a culture of innovation and improve the government's ability to address complex challenges and meet the evolving needs of citizens.

2.4 Leadership of Innovation

The study by De Vries et. al. (2016), which cites the concepts proposed by Crossan and Apaydin (2009)'s research, exemplifies the basic connection between leadership and innovation. The studies argue that both leadership and innovation are related and that both revolve around the discovery, assessment, and implementation of new opportunities and innovations.

The leadership of innovating organizations plays a crucial role in driving innovation and achieving its intended outcomes. Equipping leaders with the appropriate and necessary capabilities such leadership skills and knowledge enables them to better support innovation within the organization. This notion is relevant for both public sector and private sector organizations. Whereby, the leaders act as champions of innovation by enabling the supportive environment that nurtures innovation and where innovative ideas thrive (Stone 1981).

The research by Damanpour and Schneider (2009) and Fernández and Wise (2010) establish that leaders have a significant impact on the innovation and culture change within their respective organisations. Their argument is supported by Fareed and Su 2022, who further specify the impact of the leaders' compelling vision on encouraging and improving innovation within an organization. Hence, it could be inferred that there is a direct relationship between influential leadership and the realization of innovation within organizations.

They inspire teams, shape the organizational culture, and provide the necessary support and resources for innovative ideas to thrive (Galbraith 1982; Damanpour and Schneider 2009). Their leadership is instrumental in driving change and benefiting stakeholders and citizens (Fareed and Su 2022).

Sections 2.1 through 2.4 have examined innovation and innovation organizations from a sociological perspective. Building on the information conveyed, the subsequent Section 2.5 Public Sector Innovation Labs will focus on the intersection of innovation and public administration, while Section 2.6 will concentrate on Co-creation. The latter will further draw from the three core research areas: Innovation, Public Administration, and Sociology.

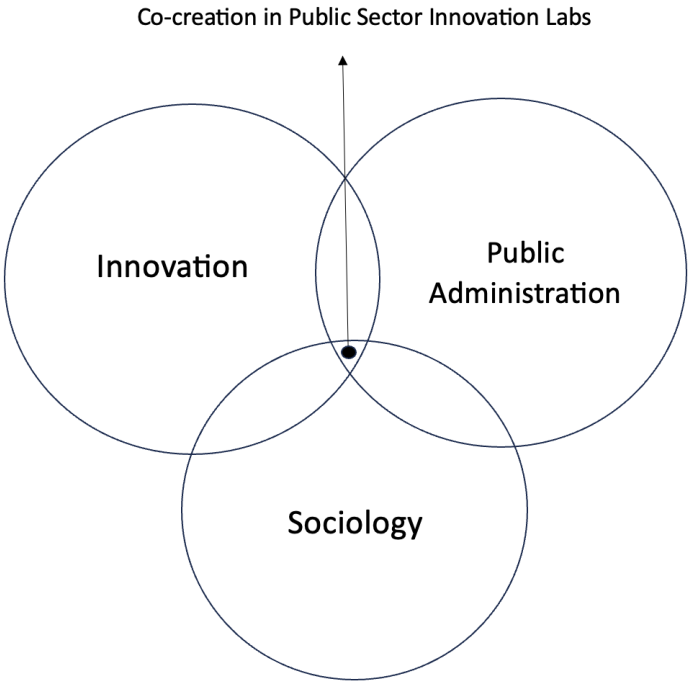

Figure 1: Intersection of Innovation, Public Administration and Socilogy
Source: Author's own illustraion

Figure 1 illustrates the interrelation of the three core research areas and the focus area of this research "Co-creation in Public Sector Innovation Labs".

2.5 Public Sector Innovation Labs

This section provides an overview of the literature on public sector innovation labs. The first subsection explores the concept of labs, also known as "labification," in public sector organizations and entails the classification of labs in the public sector. The second subsection focuses on innovation labs in the context of public sector organizations in terms of their definition, characteristics, opportunities, and challenges.

2.5.1 The Rise of Labs in the Public Sector

In the context of public sector organizations, "labification" is a global trend that has risen over the past decade. The phenomenon of labification involves incorporating scientific or experimental-like structures to develop creative policy solutions for social problems (Wellstead et al. 2021). Labs adopt the principles such as experimentation, testing, or measurement - which are commonly associated with scientific laboratories - to address societal issues (Williamson 2015)

According to Hinrichs-Krapels et al. 2020, there is a wide range of meanings and applications of the term “lab” in the public sector. It can be used to describe teams, organizations, or institutes that are specifically established to undertake innovative initiatives in the realm of public policymaking. The term “lab” can be used to refer to physical spaces that are designed to facilitate workshops or activities with a focus on policymaking. These teams, spaces, and activities are associated with various terms such as "public innovation lab," "public sector innovation lab," "government innovation lab," "organizational innovation lab," "policy innovation lab", "innovation lab", "public policy lab" "social innovation lab", "systems change lab", "living lab", "design lab" (Hinrichs-Krapels et al. 2020).

Labs have the potential to act as catalysts for innovation within host organizations. They play a crucial role in facilitating the exploration phase of innovation. Labs assist in driving the process of organizational change, akin to Kurt Lewin's change model, by aiding in the freezing and unfreezing stages (Carstensen and Bason 2012).

And uniquely, Labs serve as a dedicated space for the government to experiment, create models, and ensure their long-term viability, thereby preventing the formulation of shortsighted policies or investments. Mainly, the aim of establishing Labs is fostering innovation, promoting an entrepreneurial culture and a sense of ownership amongst government officials, and ultimately encouraging them to engage in experimental approaches (Roth et al. 2020).

Innovation labs bring together diverse teams consisting of researchers, designers, and stakeholders with the aim of exploring and examining problems from various perspectives. These teams collaborate to create, evaluate, and enhance prototypes for their eventual implementation in practical settings (Tõnurist et al. 2017). Innovation labs involve key stakeholders, including end users such as citizens and businesses (Carstensen and Bason 2012).

As labs accumulate experience and engage in ongoing learning processes, they codify effective methods and approaches (Carstensen and Bason 2012). Christiansen and Bason (2011) are cited by Carstensen and Bason (2012) in their presentation of the idea of labs and how they systematize new practices to help institutions adopt new ideas and methods through fostering collaboration, stakeholder interaction, and co-creation.

A taxonomy on labs inspired from the literature works of Schuurman and Tonurist (2017) and Fuller and Lochard (2016) was cited and presented by Adebosin et al. 2019.

The conference paper summarized the types of labs within the public sector from the literature in four categories with brief descriptions of each in Table 1:

Living Labs	Living Labs refer to an approach that involves testing digital technologies in real-life settings or environments that accurately reflect the users' natural context. This user-centered approach promotes open innovation and emphasizes systematic user co-creation. It provides an ecosystem for innovation where digital technologies are tested with actual users (Adebosin et al., 2019).
Innovation Labs	Innovation Labs are hybrid entities that combine elements of a think-tank, digital research and development (R&D), and a social enterprise. They serve as platforms for the public sector to test and scale out public services. Innovation Labs focus on experimenting with new approaches and technologies to enhance public services (Adebosin et al., 2019)..
Policy Labs	Policy Labs are specialized settings that foster innovation in the construction of public policies. They create an environment that incorporates design-oriented principles and engages citizens and companies. The aim is to address complex challenges in policy formulation and implementation through collaborative efforts. Policy Labs operate under the assumption that policy-oriented research is best conducted by multidisciplinary teams rather than individuals (Adebosin et al., 2019).
Social Labs	Social Labs serve as platforms for addressing social challenges and exhibit three core characteristics. Firstly, they bring together diverse participants from various sectors of society. Secondly, Social Labs adopt a creative and iterative approach, continually working towards resolving the issue at hand rather than conducting a one-off experiment (Adebosin et al., 2019).

Table 1: Summary of Lab Types in th Public Sector

Source: Author’s illustration of labs as presented in Adebosin et al. 2019

2.5.2 Public Sector Innovation Labs

In the past decade, there has been a growing recognition of the importance of fostering innovation within the public sector (Vrabie and Ianole-Călin 2020). Yet, the concept of innovation labs is not entirely novel to the public sector. In the 19th century, Robert Owen pioneered a lab that brought together cooperatives, schools, and healthcare providers. Similarly, in the 20th century, Wilbur Philips established a national social laboratory aimed at fostering civic participation in public policy-making and the delivery of public services (Roth et al. 2020.).

The potential advantages and societal contributions resulting from innovation have prompted numerous public entities to engage in this field, despite the associated risks and challenges. It has significantly emerged and became evident during the early 2000s, notably within Western European and North American public administrations, and has since been followed by rapid expansion and widespread global adoption (Litowtschenko and Berglund 2019). Contrary to the preconceived notions of lagging public sector innovation, prominent innovations were pioneered by public sector organizations such as the Internet and the World Wide Web (Borins 2002).

Associated with the uptake of innovation within public sector organization is the recent proliferation of labs in the public sector over the past decade. The emergence of labs is often referred to as the "labification" of the public sector or policy. The phenomenon of 'labification' within the public policy domain has witnessed a significant acceleration since the year 2010 (Williamson 2015).

Policy “labification” dovetails with the principles of collaborative governance which embed citizen active participation centrally in shaping policy outcomes (Wellstead et al. 2021). Moreover, it coincides with the perspectives that view citizens as co-creators of public services (Vrabie and Ianole-Călin 2020).

Countries across the globe are increasingly establishing innovation labs or centers as a means to address policy and challenges within the public sector in unique and transformative ways (Roth et al. 2020). As a result, a growing number of public organizations have acknowledged the importance of incorporating innovation as a fundamental aspect of their operations. Innovation labs are emerging as an integral component within the social infrastructure of contemporary public organizations, indicating a trend toward their widespread adoption (Carstensen and Bason 2012). Yet, they have a significant level of independence within the organizational structure, separate from their funding agencies and ministerial departments.(Timeus and Gascó 2018)

Labs possess methodological expertise that allows them to comprehend social problems, gain insights into the public perspective, and generate ideas for future policy interventions and governance practices. Williamson (2015) characterizes labs as hybrid organizations that address complex social problems that challenge governments by blending aspects of political think tanks, design, digital thinking research, and R&D labs (Williamson 2015).

Timeus and Gascó 2018, describe innovation labs in the public sector as a "new institutional arrangement" to facilitate the implementation of experimental and user-centered approaches in public policy and service design. The recent increase in the adoption of an evidence-based approach to decision-making has led to the emergence of Public Sector Innovation (PSI) labs as a prominent example of this trend (Williamson 2015).

Innovation labs prioritize collaborative efforts. Collaboration takes place amongst various government departments or agencies (Tõnurist et al. 2017) to developing novel solutions together with people, rather than solely creating solutions for them (Carstensen and Bason 2012). This approach improves implementation outcomes by fostering a deeper administrative understanding of how citizens perceive and engage with social problems, services, and programs (Clarke and Craft 2019).

Innovation labs serve as dedicated "safe" spaces for collaboration across various units, departments, and sectors. where innovation can thrive (Carstensen and Bason 2012). Moreover, they serve as agents for the development of innovation within the public sector which has prompted several governments across the globe to prioritize their establishment (Alblooshi 2017).

Despite the uptake of research on innovation labs, there is still a lack of consensus among practitioners and researchers regarding a common definition or terminology to precisely describe the term "Innovation Lab" (Alblooshi 2017). Public sector innovation labs are commonly perceived as experimental in nature and may be situated at different levels within government. Some labs are centralized within the executive branches of government, while others are situated between different government agencies and departments. (McGann et al. 2018).

Public sector innovation labs offer a wide range of opportunities to the public sector due the unique combination of size, approach, and methods, as well as their operational flexibility (Lewis 2021; McGann et al. 2018).

The role of an innovation lab is centered on housing and fostering collaboration between innovation lab teams and personnel from diverse operational domains, with the aim of

jointly addressing mutual challenges through the application of creative and novel approaches (Carstensen and Bason 2012; Alblooshi 2017).

However, despite their increasing prevalence in recent years, labs face barriers and operate in the complex, stringent and yet rapidly evolving environment of public sector organizations (Litowtschenko and Berglund 2019 ; Borins 2002). Given that public sector organizations are often regarded as rigid monopolies, their perceived lack of innovation is attributed to the absence of external competitive incentives that could potentially stimulate their innovative capacities (Borins 2002).

Hence, it is theorized that the introduction of innovation labs practices within the public sector may potentially conflict with existing processes and conventional principles such as accountability (Borins 2002). Moreover, a discernible conflict that persists within the public sector according to Litowtschenko and Berglund (2019) is the fact that many view the work of Labs as merely "alternative" can be substantially detrimental to their mission (Litowtschenko and Berglund 2019).

The research of Lehtinen 2022 demonstrates that accountability structures, organisational culture, and staff attitudes are systemic barriers to innovation labs. The system barriers that labs operate within such as accountability structures may hinder with the cooperative, cross-sector operations. Moreover, the organisational culture and mindset within the public sector, are characterised by risk aversion and 'expert' perspectives, tend to favour incremental innovation over radical innovation (Lehtinen 2022).

In conclusion, innovation labs in the public sector act as catalysts for driving organizational and co-creation processes within a safe dedicated space. Yet, are faced by multiple challenges.

2.6 Overview of Co-creation

This section provides an overview of the literature on co-creation. The first subsection explores the concept of co-creation, the process, and its wide range of applications. The second subsection focuses on co-creation literature in the context of public sector organizations.

2.6.1 The Concept of Co-creation

Contemporary discourse in the field of management research encompasses terms such as "interactive," "spontaneous," "adaptive," "co-creation," "networking," and "self-organizing" (Leino and Puumala 2021). The notion of co-creation emerged as a novel concept in management studies. It entails interactive processes between companies and end-users to produce value (Galvagno and Dalli 2014).

Scholars have embraced the term "co-creation" across various domains, leading to a proliferation of diverse approaches and theoretical perspectives within the field. Consequently, this research stream has become increasingly intricate, prompting some scholars to call for systematic and analytical clarification, as well as a shared understanding of the diverse discourses and definitions pertaining to co-creation (Saarijärvi et al. 2013).

Co-creation is more effective than top-down reform as it places a great emphasis on valuing the diversity of the varying user requirements (De Koning et al. 2016). The manner in which value is generated, allocated, remunerated, and leveraged deviates significantly from the conventional frameworks. Service proiders and users are no longer viewed as opposing entities, but rather as entities with a mutual aim to foster the creation of novel opportunities and prospects (Galvagno and Dalli 2014).

Moreover, co-creative processes challenge the perspectives of all involved parties and seek to integrate professional and local expertise in innovative ways (Cottam and Leadbeater 2004). The potential of co-creation lies in its ability to dismantle hierarchical structures among various stakeholders, including local government, businesses, universities, citizens, and other actors (Leino and Puumala 2021).

Collaboration among diverse actors and sectors has been recognised as essential for addressing complex societal issues that cannot be addressed or resolved by public sector organisations solely(Tuurnas et al. 2019).

2.6.2 Co-creation in the Public Sector

Co-creation processes fundamentally arise and develop in response to a necessity for transformation. This requirement pertains to the advancement of public services, the implementation of modern service delivery, and digitalization (Leino and Puumala 2021).

The terms Co-production and Co-creation in public service both refer to participation but have stemmed from different origins (Lember et al. 2019). Studies of Co-production in public service were pioneered by Nobel laureate Elinor Ostrom's research (Verschuere 2020). While studies of Co-creation, stemmed from marketing research and were later applied to public management studies. There is a general consensus that both concepts pertain to citizen engagement (Lember et al. 2019). As a concept, co-creation has now garnered a global uptake as well as a wide range of applicability across various contexts and fields (Brandsen and Honingh 2018; Galvagno and Dalli 2014; Osborne et al. 2016; Criado et al. 2021).

Co-creation entails a novel approach to public service delivery and policy development. Despite the complex challenges that are interwoven with this concept (Torfing et al. 2019). The concept of co-creation has the potential to revolutionize the public service sector by shifting its perception from that of a mere authority and service provider to a collaborative and enabling platform. (Torfing et al. 2019).

Co-creation denotes a paradigm shift in the approach toward public service delivery and policy development, wherein the public sector is being transformed into what Torfing et al. 2019 describes as an "arena" for collaboration (Torfing et al. 2019).

Motivations and practices for engaging citizens in public sector processes are diverse (Hilgers and Ihl 2010). Policymakers often view co-creation as a response to the declining legitimacy and resources of the public sector (Brandsen et al. 2018). Advocates of co-creation argue that it replaces public service monopolies and public-private competition with multi-actor collaboration, fundamentally transforming the perception of the public sector (Torfing et al. 2019).

In the context of public problem-solving, co-creation has the potential to enhance social cohesion and foster more resilient communities by enabling local actors and marginalized groups (Torfing et al. 2019; McGann et al. 2018). It is considered a key approach in fostering sustainability, markets, services, public spaces, transportation and safety (Leino and Puumala 2021).

According to Bason (2010), and in alignment with De Koning et al. 2016's steps of Co-creation, the public sector generally follows the same direction. Starting from the

invitation to collaboration, along with the public decision to the collective decision-making between the concerned stakeholders.

This process can generally include the following steps:

- Identify and analyze the issue or the common concern.
- Define the concerned stakeholders and Engaging with those stakeholders.
- Ideation and co-design for the promoted solutions.
- Prototyping and testing the idea and gathering feedback for the necessary adjustments.
- Implementing and evaluating the solution, measuring its impact on the specific period of time.
- Continuous evaluation and improvement of the solution.

2.6.3 PSIL Co-creation

Having specialised innovation labs may be one of the biggest benefits when it comes to improving the ideation process of innovation since innovation labs can provide the required expertise, equipment, and resources to facilitate the process in the area of citizen involvement and enhance problem solving in the public sector (Bason 2010; McGann et al. 2018).

Innovation labs operate in the public domain at the local, regional, or national levels and across diverse initiatives, entities, and sites both internal and external to governmental organisations (Litowtschenko and Berglund 2019; McGann et al. 2018). They operate by leveraging the principles of design to facilitate the cultivation of experimentation and innovation, and advocate for the promotion of flexibility within the public sector (Kimbell 2017).

Bason 2010, categorizes the four components that comprise the innovation ecosystem. They are summed in what Bason refers to as the “4C’s” - which stands for courage, co-creation, capacity, and consciousness. In order to catalyse and sustain innovation within the public sector, it is imperative for public sector leaders to comprehensively attend to all components of the innovation ecosystem.

One of the categories or components of the ecosystem is Co-creation which refers to the process of designing and learning. Through co-creation, innovation labs have the potential to improve the capacity to drive strategic innovation (Bason 2010). Labs can foster an atmosphere conducive to originality and idea generation. Additionally, they provide the essential tools, talents, equipment, locations, and technologies to support the co-creative process.

Bason (2010) identifies the role of leadership in the co-creation process as on of the its tertiary constituents. The leadership of co-creation is founded upon utilizing the principles of design thinking and citizen engagement, with the aim of optimising the organization's resources. In order for leaders to achieve success in co-creation, Bason (2010) stuggests that it is imperative for leaders to combine the competencies and expertise acquired from conventional disciplines like public administration and professions, with contemporary domains such as qualitative social research and design thinking.

2.6.4 Co-creation Barriers and Challenges

Despite the intended positive outcomes of co-creation, it may yield negative outcomes that must be anticipated and effectively mitigated. As a result of unintentional poor management, misunderstandings, or misuse (Ansell and Torfing 2021). Along with that, there are also barriers to co-creation in the context of the public sector.

Some barriers may result as outcomes of the internal process of the co-creation due to government structures, unmatched political agendas, or internal reluctance to the change. However, aside from the internal ones, other barriers might result as outcomes of the implementation of the co-creation strategy. And that may be due to the involvement of external factors in those processes, such as communication difficulties and cultural resistance, which may be further exacerbated by power dynamics in the backdrop.

This section is dedicated to covering the internal barriers and challenges to the implementation of co-creation in the public sector.

Bureaucracy and red tape: Navigating the public administration’s bureaucracy and red tape may hinder public sector innovation labs as they hinder the process and as a result may deter citizens and other stakeholders from taking part in co-creation initiatives (Rösler et al. 2021).

Lack of trust and communication: Public servants may be skeptical in trusting other stakeholders, such as the citizens, to be involved in the creation process and contribute

meaningfully, leading them not to share enough information with the citizens and the other stakeholders (Edelmann and Mergel 2021).

Lack of incentives: Executing co-creation may be associated with several challenges at each step. The challenges and uncertainties of co-creation may spur public servants' hesitation to partake in it. Moreover, the lack of rewards or recognition of such extensive process may lead to a lack of motivation and commitment. This demotivation may consequently lead to the failure of co-creation (Scupola and Mergel 2022).

Unmatched political agendas: Unmatched political agendas may constitute a barrier to co-creation, whereas the process requires different stakeholders to agree on common grounds and goals. Establishing mutual agreement across the board may be challenging to achieve and maintain. Additionally, it could possibly exacerbate division between the stakeholders' views and create tension (Mergel and Desouza 2013).

Ansell and Torfing 2021 recommend anticipating the potential challenges associated with co-creation as a primary step. In their study, they describe the challenges as "dilemmas" and propose "coping strategies" to address them. In their research, Ansell and Torfing (2021) point that co-creation is evolving and requires further exploration, development, and validation within the context of the public sector.

2.7 Gaps in Literature

The reviewed literature in the previous subsections has revealed gaps and areas of research needs in the field of study of co-creation in the public sector and specifically public sector innovation labs. A research gap is an area within a specific topic or field for which there is either insufficient information or insufficient knowledge, limiting the ability of reviewers to reach a conclusion regarding a particular inquiry (Robinson et al. 2011). The identification of research gaps presents an opportunity to conduct new or enhanced research hence resulting in the expansion of the studied field (Ajemba and Chinwe 2022).

As a subject, innovation in the public sector is still undertheorized and under researched. It is only just emerging from a phase in which studies from the private sector were the predominant focus of attention. This justifies the need to place a particular emphasis on studying innovation in the public sector (Hartley et al. 2013). To avoid viewing public innovation as a "magical concept" or a "mere trend" as Serrano Cárdenas et al. suggest, further research in this area is required in order to deepen and develop the

conceptualization of the topic from an integrated perspective that articulates previous research material (Serrano Cárdenas et al. 2019)

Gaps in Co-creation in PSIL Literature

PSI labs have garnered limited scholarly consideration in both the fields of policy sciences and public management (McGann et al. 2018). The focus of research has been on PSI Labs as an institution, but not so much on the individuals who work there. In addition, research on Public Sector Innovation Labs has primarily focused on organizational aspects instead of disciplinary contributions within the units (Litowtschenko and Berglund 2019). An alternative approach could involve shifting the unit of analysis from the organization to individual workers within PSIL (Wellstead et al. 2021).

Gaps in Co-creation Literature

Given the growing demand for innovation in the public sector, it is particularly surprising that the public sector does not have a sufficient amount of research endeavors focused on collaborative innovation. Moreover, despite the widespread adoption of co-creation in public sector discourse, it continues to be an inadequately developed area in the literature (Torfing et al. 2019; Leino and Puumala 2021). Hence, exploring the potential of co-creation by examining the self-organizing and emerging relationships within and between the systems and their given environments would be valuable (Fox et al. 2019).

2.7.1 Linking Research Problems, Gaps, and Future Research Suggestions

By building on the research problems identified in Section 1, and gaps in literature presented in this section this research aims to link them with the outlined research questions of this research.

The role of the organization's leaders as suggested by Bason 2018, Jukić et al. 2022, Vannoy and Salam 2010 is also covered and linked to the focus of this research in this section.

The following research problems, combined with the research gaps summarized in Table 2 inform the scope of this research.

- The knowledge gap in the understanding the innovation process in the context of the public sector (Carstensen and Bason 2012).

- The limited scholarly attention towards innovation labs, including PSI labs. Especially in their association with co-creation and collaborative approaches (Tõnurist et al. 2015; McGann et al. 2018).

- The lack of consensus on the definition and scope of co-creation, which hinders research progress in the field (Matamala and Soler-Vilageliu 2022; Stock and Boyer 2009; Sarasvuo et al. 2022).

- The varying interpretations of concepts among organizational actors which leads to ambiguity (Nicolai and Dautwiz 2010).

- The lack of shared language and interpretation of concepts and ambiguity which risks misinterpretation of concepts within organizations (Nicolai and Dautwiz 2010; Nielsen et al. 2019) (Sarasvuo et al., 2022; Phi and Dredge 2019).

- The insufficient scholarly consideration of PSIL, particularly in understanding their function, impact, and challenges (Tõnurist et al. 2015; McGann et al. 2018).

Given that the current research literature have predominantly focused on PSI labs as institutions while neglecting focusing on the individuals who work within these labs in areas including but not limited to their roles, perspectives, and challenges. This research focused on the interpretations on the leaders within the PSIL.

Also, given that there are multitude of perspectives surrounding co-creation leading to its ambiguity and loose definition, this research focused on examining the multiple interpretations of co-creation and further analyze how it affects its implementation.

Hence, the research gap that can be derived from the afore mntioned gaps highlighted in the reviewed literature is as follows: A lack of comprehensive understanding of public sector innovation labs (PSIL) and their associated co-creation interpretations and practices.

This research aims to address the identified research gaps, problems, and future research suggestions from the reviewed literature by focusing on exploring the individual perspectives of individuals working within PSI labs in relation to co-creation.

The choice of the research methodology, research setting, and group of interviewed individuals for this research were guided by the appropriate theoretical framework and research methodologies and design outlined in the upcoming sections in this research.

Topic	Research	Literature Gap	Future Research Suggestions
PSIL	(Litowtschenko and Berglund 2019). (Wellstead et al. 2021). (Tõnurist et al., 2015) (McGann et al., 2018).	The focus of research has been on PSI Labs as an institution, but not on the individuals who work there. Limited scholarly consideration of public sector innovation labs (PSI) labs. While these labs are associated with co-creation, co-design, and co-production, there is a lack of comprehensive research on their functioning, impact, and the specific challenges they face (Tõnurist et al., 2015; McGann et al., 2018).	An alternative approach could involve shifting the unit of analysis from the organization to individual workers within PSIL (Wellstead et al. 2021).
Co-creation	(Torfing et al. 2019) (Leino and Puumala 2021). (Fox et al. 2019). (Ansell and Gash, 2007).	Multitude of perspectives, surrounding co-creation have contributed to ambiguity (Sarasvuo et al., 2022).	Exploring the potential of co-creation by examining the self-organizing and emerging relationships within and between systems and their environments would be valuable (Fox et al. 2019). Co-creation initiatives are influenced by diverse interests, levels of knowledge, and power dynamics among stakeholders (Ansell and Gash, 2007). Understanding these dynamics and how they shape the initial conditions and outcomes of co-creation processes is essential.

Table 2: Research Gaps Summary
Source: Author's own illusttration

3 Theoretical Framework

Theoretical frameworks are structured and tested set of concepts that offer a systematic explanation of occurrences. Incorporating theoretical frameworks into qualitative research is key to maintaining the quality of the study. The use of theory guides the researcher's inquiry into a specific subject matter (Nguyen et al. 2022).

This research adopts the Social Construction of Technology (SCOT) framework as a guiding theory for the inquiry and analysis. The stages of research questions formulation, data collection, and data analysis employed the framework's first formulation introduced by Pinch and Bijker (1984).

In the context of this research, given the interpretative nature of the inquiry and interactive organization context, the interpretative flexibility element of SCOT constituted a suitable element to guide the exploration and understanding of leaders' interpretations of co-creation.

Additionally, SCOT was selected for the flexibility it yields for its key unit of analysis (technology) by enabling the analysis of non-physical technology as well - such as innovative activities and processes such as co-creation in the context of this research.

3.1 Social construction of Technology Framework

Innovations are prevalent across different hierarchical levels within organizational structures, encompassing alterations in organizational forms, routines, processes, and other interconnected elements (Hill 2010).

Hill 2010 suggests the analysis of organizational innovation by considering the influence of social routines and social structure. (Vannoy and Salam 2010) suggest that interpretive sociology provides a foundation for examining organizations.

The SCOT framework offers a comprehensive methodology for examining the intricate dynamics between individuals, technology, and institutions. It recognizes that the development and shaping of technologies can vary depending on the participation and influence of different actors and groups (Prell 2009) by highlighting the significance of relevant social groups or actors who share a common understanding of an artifact or technology (Permana and Gan 2022).

Moreover, the Social Construction of Technology (SCOT) theory holds that technologies are not born from preset design decisions. Social interactions involving multiple social

groups and actors shape them. It suggests that technology design is adaptable, therefore its form and effects may have evolved depending on its creators and users (Prell 2009).

This research utilizes the first formulation of the Social Construction of Technology (SCOT) framework, as outlined Pinch and Bijker (1984) and and further explained by Prell 2009. There are three components:

1. The interpretative flexibility: The degree of interpretive flexibility inherent in a technological artifact becomes evident through the diverse interpretations exhibited by different social groups. These varying interpretations serve as indicators of the extent to which an artifact can be interpreted in different ways.

2. Closure and Stabilization: The concepts of closure and stabilization are closely connected, as the ongoing interactions among relevant social groups lead to a gradual reduction in the diverse interpretations of an artifact.

   Closure: The process by which multiple interpretations are narrowed down is widely recognized as the closure of an artifact. Closure is observed when there is a decrease in the level of interpretative flexibility that is linked to an artifact.

   Stabilization: The notion of stabilization is concerned with the degree of acceptance of an artifact within a particular social collective. The level of stability within a social group for a specific artifact is contingent upon the extent to which the meanings attributed to it are consistent and uniform among its members.

3. The Wider Context: The context in which artifact development occurs. It encompasses a broader scope of organizational or political factors (Klein and Kleinman 2002).

These three elements of SCOT's first formulation are most suitable for the focus of this research.

3.1.1 Artifacts in SCOT

Co-creation - the technology artifact in this research is presented as social technology.

Technological artifacts encompass not only physical objects, but also the activities and processes described by Bijker et al. (1987) and Pinch and Bijker (1984) as "steelmaking" or "moulding." Additionally, they encompass the knowledge and actions of individuals.

Leibetseder (2011) examines the concept of “social technology” through a critical analytical study of the term. According to Leibetseder (2011), social technology utilizes and re-purposes social expertise to address social problems.

In a specific reference to the application of social technology in government, Leibetseder instills that social technology is inherent in “modern government” through what they describe as “introduction of new techniques and new procedures, new administrative ways of politics and for specific conception of power between authority and subject” (Leibetseder 2011). In reference to Nelson (2002) and Nelson (2005), Leibetseder (2011) adds that innovation occurs when social technology spurs the creation and further advancement of “new technologies”.

Additionally, In the study conducted by Yousefikhah in 2017, it was observed that the term "artifact" has the potential to be used interchangeably with various other terms such as "technology" "product" "solution" or "routine" (Yousefikhah 2017). For example, as mentioned by Elle et al. 2010, this encompasses the specialized knowledge required for the development of a bicycle or the utilization of an ultrasonic device within the context of an obstetrics clinic (Elle et al. 2010).

The concept of flexibility in the interpretation of technology arises from the inherent variability in individuals' cognitive processes when interpreting a given object or phenomenon (Bijker et al. 1987). Actors influence the formation of an artifact through their perspectives. There are multiple degrees of interpretive flexibility among individuals in their understanding of artifacts with no singular method or optimal solution (Elle et al. 2010).

The perspectives of various social groups regarding technological solutions exhibit notable divergence, which can be attributed to differences in their understanding of the underlying issues, the proposed remedies, and the potential for technological advancements (Permana and Gan 2022).

In the context of this study, SCOT provides valuable insights into the sociology of innovation and the social construction of technology, allowing researchers to explore the nuances of actors' interpretations of co-creation.

In this study, the artifact (or social technology) is the process of co-creation. The interpretative flexibility of co-creation is explored by interviewing directors - each director leads a unique group of actors within the organization involved in co-creation. The consideration of co-creation as an artifact or social technology is supported by Leibetseder (2011)’s critical review and citations of Nelson (2002).

The variability and degree of flexibility in interpretations that arise from the interviews provides a to the extent to which the understanding of co-creation is uniform or stabilized within the organization.

Through exploring examples and barriers that each actor identifies in the interview process, an understanding of additional factors and analysis of the wider context could be drawn. The following table presents the alignment of the research questions with the SCOT framework - with an extension of the sub themes that emerge and are presented in the subsequent Sections 5 and 6.

Research Question	SCOT Element	Emerging Themes
How do the interpretations of co-creation by leaders in public sector innovation labs influence the implementation of co-creation?	Interpretative Flexibility	High Interpretative flexibility of Co-creation Low Interpretative flexibility of Co-creation
	Stabilization and Closure	Implementation (Low stabilization) Implementation (High Stabilization) Closure
What perceived barriers in the wider context, as identified by leaders in public sector innovation labs, impact their interpretations and implementation of co-creation?	Wider Context	Resources Structures Individual Perceptions
What are the key requirements or resources that leaders in public sector innovation labs identify as necessary to overcome the perceived barriers and enhance the implementation of co-creation?	Wider Context	Governance structures Collaboration Risk

Table 3: Aligning Research Questions and SCOT Elements
Source: Author's own illustration

4 Methodology

Research methodology is a systematic approach to solving a research issue. It can be described as the study of the numerous scientific procedures for conducting research (Kothari 2004).

The reference provided by (Davidavičienė 2018), citing Saunders (2012), highlights the concept of methodology as a guide to the process of conducting research. Methodology encompasses the underlying theoretical and philosophical assumptions that form the foundation of the research, as well as the implications these assumptions have on the selection and implementation of specific research methods.

4.1 Research Philosophy

Research philosophy is the principle that regulates the techniques that should be collected, compiled, and analyzed to produce results that can be valid for decision-making. The philosophies depend on epistemology, which concerns assumptions about knowledge, what constitutes acceptable, valid, and legitimate knowledge, and how we can communicate knowledge to others (Saunders et al. 2009). Research philosophies are crucial because they are built into all of the research methods and general research practices, which makes it important to align the research philosophical practices and the research methods (Mauthner 2020).

This research adopts a research philosophy to demystify different aspects of the study phenomena, which incorporate exposing, and critically analyzing the situation of the study concept, and clarifying the unsustainable dimensions, unavailable information, and the confusion that may have been observed about the research topic during the literature review stage (Li and Zhu 2023).

The key types of research philosophies are positivism, pragmatism, realism, and interpretivism (Saunders et al. 2009).

This research adopted the interpretivism philosophy, which incorporates the interpretation of elements of a research activity based on the human interest that necessitated the study. The interpretivism philosophy allows the researcher to assume the existence of reality and possible access to it through social parameters, which include language and shared instruments (Li and Zhu 2023).

The interpretivism philosophy majorly depends on qualitative data collection, which allows the researcher to theoretical analysis and the consequent formulation of solutions that may not handle all the underlying problems in the phenomenon under study

(Mauthner 2020). For example, for this research, it is suitable for the collection of information on the perceptions of innovation lab staff on the process of co-creation.

Interpretivism involves the generation of inquiries that aid in the collection of deep information regarding the subject of interest (O' Gorman and MacIntosh 2016). Therefore, the philosophy could aid in gathering extensive information on the role of co-creation in administrative operations of public sector innovation labs.

The research philosophies facilitate the formation of a precise method of research, by providing an enhanced understanding of the requirements of the study. The researchers adopt a research philosophy to dissect the rationale for the study and the expected applications of the outcome, hence formulating a precise data collection and analysis strategy that would enable the collection of relevant and robust information that would be sufficiently applicable in solving a prevailing problem (Saunders et al. 2019)

Hence, the interpretivism philosophy was the best for this study because it could be the most effective in collecting robust information to use in formulating a conclusion and an understanding of the interpretations of the interviewed lab staff.

4.2 The Research Approach

The research approach dictates the processes for data collection, analysis, and interpretation of the results. The selection of an approach depends on the type of data that the scholars intend to collect, regardless of whether the targeted information is secondary or primary (Sileyew 2019). This research obtained qualitative data; hence the inductive approach was chosen over the deductive and adductive approaches.

The initial step of a research process based on inductive reasoning is observing the behavior of variables or aspects of interest, identifying the patterns of characteristics, and formulating explanations for the observed characteristics. Hence, the inductive study does not require an initial formulation of a hypothesis or a list of expected theories at the beginning of the study (Saunders et al. 2019). In the inductive approach, the researcher decides the direction of the study at any point just before the data collection stage, hence allowing for the adjustments of objectives and research questions based on the scholar’s changing interests. The researcher may suggest that the inquiry is not precise for the collection of specific information, hence altering or changing the question.

Therefore, the inductive approach was adopted to enable flexibility in conducting research.

A study using a deductive approach begins with a specific pattern and establishes if there is an association between two or more observed phenomena or variables (Casula et al. 2021). The existing pattern is observed against an expected pattern, to indicate if there is a relationship between the two sets of data. As a result, the scope of information collection substantially depends on the nature of existing data, hence the researcher may not divert to another variable that may be of significant influence to the phenomenon under study.

The absence of hypotheses at the start of a study when using the inductive approach allowed this research to present anecdotes or proofs of the existence of a specific phenomenon. The evidence collected during the study formed the basis for forming logical conclusions and eliminated the presentation of the central point at the start of the research process (Barroga and Matanguihan 2022). Displaying the main point or the area of concern, as indicated by the hypothesis, would have been restrictive to the direction of responses and would have limited the scope of data collection. Also, the presence of hypotheses would have led to the amendment of the results to attain specific expectations of the outcome. (Kabir 2016).

Hence, the inductive approach was selected as the most suitable to the goal of this study and the questions outlined in preference to the deductive and abductive approaches.

4.3 Research Design

Research design is the framework for answering the study questions or attaining the objectives. This insight underlies the assumption design equips a researcher with research competencies to understand methodological knowledge and undertake research projects (Matos et al. 2023). Additionally, the research design determines data collection and analysis strategies. This research applies a phenomenology design for data collection and analysis.

Phenomenology is applied to understand a specific phenomenon by interacting with the respondents and obtaining data on their experiences (Frechette et al. 2020). The perceptions of participants display the actual status of their involvement in the process (Li and Zhu 2023).

The use of phenomenology design for this research was intended to display the interpretations of interviewees indicating the attitudes towards other aspects of co-creation such as the perceived barriers to co-creation. Additionally, phenomenology aided in the narrative analysis in the findings section of this research.

In the qualitative research methodology context, researchers employ a variety of data analysis techniques. These include but are not limited to the Interpretative

Phenomenological Analysis (IPA) technique, Grounded Theory, Ethnography, Case Studies, and the Narrative method (Alase 2017). Over time, Phenomenology has evolved to meet the demands of qualitative research (Moustakas 1994).

The primary goal of phenomenological research is to convey shared interpretations of individuals' firsthand experiences regarding a specific concept or phenomenon (Creswell 2013). In this research, the phenomenon of interest is co-creation in public sector innovation labs.

By focusing on how leaders in these labs understand and implement co-creation, this research aligns with phenomenological researchers' primary focus, which is to highlight the shared aspects intrinsic to the participants' experiences of a phenomenon (Creswell 2013).

This research's choice of Interpretative Phenomenological Analysis (IPA) is influenced by its suitability in understanding complex phenomena such as individual perceptions and experiences. Specifically, IPA allows multiple participants to recount their experiences without bias or alterations (Alase 2017), a feature that is particularly useful in answering this study's research questions. By using IPA, this study seeks to interpret deeper meanings and perceptions beyond mere description of occurrences, which is in line with our main research questions that focus on interpretations of co-creation by leaders in public sector innovation labs and how these interpretations influence its implementation.

Formulating research questions is an evolving process that parallels the progression of a research project (Trede & Higgs 2009). For qualitative research, such as this one, research questions reflect the values, worldview, and direction of the inquiry and play a crucial role in determining the nature of the knowledge to be generated (Trede & Higgs 2009).

Guided by Alase (2017)’s suggestions, this study poses two central questions, supplemented by a sub-question. The following two main research questions and sub questions are designed to maintain the open-ended nature of the investigation while refining the study's focus.

> Main Research Question 1: How do the interpretations of co-creation by leaders in public sector innovation labs influence the implementation of co-creation?

This question seeks to explore the subjective experiences and interpretations of leaders in public sector innovation labs. IPA is designed to explore in depth how individuals perceive and make sense of their world. In this case, it would allow this research to delve deeply into how these leaders understand and implement the concept of co-creation.

> Main Research Question 2: What perceived barriers in the wider context, as identified by leaders in public sector innovation labs, impact their interpretations and implementation of co-creation?

Again, this question is centered around perceptions and interpretations - specifically, perceived barriers to the implementation of co-creation. IPA would allow this research to uncover these perceived barriers and understand how they influence the leaders' conceptualization and implementation of co-creation.

> Sub-Research Question: What are the key requirements or resources that leaders in public sector innovation labs identify as necessary to overcome the perceived barriers and enhance the implementation of co-creation?

This question seeks to explore what leaders believe they need to successfully implement co-creation. An IPA approach would enable this research to gather detailed accounts of these requirements or resources, as identified by the leaders themselves.

As Creswell (2013) suggests, this research provided a textural description of participants' interpretations using direct quotes in **section 5 titled Findings**. As well as a composite description combining both textural and structural descriptions will capture the essence of the experience, serving as the product of this phenomenological study (Creswell, 2013).

4.4 The Population

This research aims to explore the interpretations of leaders or senior directors in a public sector innovation lab in British Columbia, Canada.

The Sample Population and Size

For the sample size selection in this phenomenological study, this research follows Creswell 2013's recommendation that participants should range between 2 and 25 and accurately represent the homogeneity within the sample pool. This enhances the understanding of participants' collective experiences. In addition, Smith and Osborn 2007 suggest analyzing each case independently before assessing their similarities and differences when dealing with a minimal number of cases.

Smith and Osborn (2007) advocate for a sample size of five or six for a student research project employing the IPA approach, which this study has adhered to. This smaller sample size offers a balance, enabling comprehensive engagement with each individual case and facilitating a detailed exploration of commonalities and divergences.

A total of five interviews with senior public servants were conducted. Four interviewees are at the director level of teams within the public sector innovation lab – The Exchange Lab. And one interview with the Assistant Deputy Minister who overlooks the branch where the Exchange Lab team is situated within the government of British Columbia.

The sample population was selected from a single administrative branch within the government of British Columbia. The region was chosen because of the rapid levels of technological development occurring in the region, which places it in an advanced to involve citizens in decision-making (Ministry of Jobs Trade and Technology 2020).

Bason 2018's summary of innovation roles guided the selection of the roles interviewed for this research. The three roles of top executive, mid-level manager and institution head were interviewed. Interviews for the politician role were eliminated for this research as it was not part of the staff roles within the Exchange Lab. Yet, the influence of the role of politicians on co-creation within the public sector was highlighted by the interview participants in **Section 5: Findings**.

Prell 2009 elaborated on the process of identifying the actors by referring to the process of following the actors, introduced by Pinch and Bijker 1984. The process entails having each actor suggest another relevant actor, until eventually no new actors are named (Prell 2009).

As suggested in SCOT, the interview participants were identified by the process of following the actors - whereby the researcher would interview the suggested actors as they were being named during the former interviews, until eventually no new actors are named (Prell 2009). The first interviewee and most senior role at the lab is executive director. The executive director recommended interviewing the Director of Digital Portfolio and then each interviewee nominated the subsequent until no additional individuals at the senior level within the innovation lab were identified. Leading to five research interviews with directors in total.

Bason 2018's summary table in Appendix 1 of innovation inspired the researcher's the categorization of the roles interviewed for this research. The three roles of top executive, mid-level manager and institution head were interviewed. Interviews for the politician role were eliminated for this research as it was not part of the staff roles within the Exchange Lab. Yet, the influence of the role of politicians on co-creation within the public sector was highlighted by the interview participants in Section 5:

The following five interviews were conducted for the data collection of this research.

	Role	**Bason 2018's Classification**
1	Executive Director	Institution Head
2	Director of Digital Community and Engagement	Mid-Level Manager
3	Senior Director Digital Portfolio	Mid-Level Manager
4	Senior Director, Modernization Advisory Services	Mid-Level Manager
5	Assistant Deputy Minister	Top Executive

Table 4: Interviewee Roles and Categorization
Source: Author's own illustration

4.5 Data Collection Tools

The primary research involved the collection of qualitative information using open-ended semi-structured interview questions, which focused on co-creation interpretations, perceptions of the co-creation process, and barriers to co-creation. Using interviews shows that a researcher appreciates the value of personal interaction and the critical data that is collected through the views that are collected through mechanisms that are collected through the interviewees' views rather than data from anonymous people (Sutton & Austin, 2015).

A set of interview questions was sent to the public servants to gather information regarding their sentiments regarding innovation labs, co-creation, and the impact of involving the citizens in governance affairs.

The following set of questions that was used during the five semi-structure interviews.

1. How do you interpret the concept of co-creation in your work within the public sector innovation lab?

2. How do you define co-creation and what does it mean to you in the context of your work?

3. Can you describe a specific example of a co-creation process that you have been involved in?

4. In your opinion, what are the benefits of co-creation in your initiatives?

5. What barriers do you perceive in the wider context that impact your interpretations and implementation of co-creation?

6. What resources or requirements do you identify as necessary to overcome these perceived barriers and improve the implementation of co-creation?

7. What are the main challenges or barriers to successful co-creation at exchange lab?

4.5.1 Data Collection Procedures

The participants were contacted primarily via email and informed about the research in an extensive email outlining this research's purpose, subject, and questions.

The interviews took place virtually and were hosted via the participants organization's authorized video conferencing platform - which was necessary to ensure the participants' compliance with their organization's privacy and safety policy for participating in external communications.

Prior to the interviews, participants provided their consent for the interviews to be recorded, ensuring that their responses could be accurately transcribed and analysed for this research later by the researcher.

These transcriptions subsequently served as the foundation for the data analysis phase, helping to illuminate the research questions under investigation.

4.6 Data Analysis Methods

In order to analyze the data from the interview transcripts, this research followed a structured approach in line with the phenomenological research methodology advocated by Creswell (2013).

Initially, a list of significant statements was developed. These statements were extracted from the interviews with lab leaders and other relevant sources. Each statement provided unique insights into a participant's understanding and application of co-creation in their respective labs. All statements were treated with equal importance, culminating in a list

of distinct, non-overlapping statements that illuminated different facets of the co-creation concept within the public sector innovation lab context.

Once the significant statements were identified, these were grouped into larger units of information, known as "themes". These themes facilitated the recognition of common patterns and overarching trends regarding the perception and implementation of co-creation within public sector innovation labs. As well as for the analysis of the wider context perceived barriers.

The subsequent phase involved constructing a textural description of the leaders' interpretations. To ensure the authenticity of the leaders' voices and experiences, direct quotes from the interviews were included in the analysis in section 5: Findings and in section 6: Discussion.

Following the textural description, a structural description was developed that focused on 'how' the interpretations of co-creation influence its implementation. This stage involved reflecting on the setting and context in which the co-creation was perceived and implemented in the public sector innovation labs.

Finally, the description combined the textural and structural descriptions, providing a comprehensive understanding of the leaders' interpretations and implementation of co-creation. As Creswell (2013) indicates, this composite description encapsulates the 'essence' of the leaders' interpretations and implementation of co-creation.

4.7 Secondary Research Methods

4.7.1 Databases

The main journals for obtaining secondary sources included the Organizational Develoment Journal, Journal of Public Administration Research and Theory , Journal of Information Technology and Politics. And data bases such as Scopus, Google Scholar, Sage, and Research Gate were considered for the extraction of secondary data.

4.7.2 Keywords

The main search terms were co-creation, innovation, public sector innovation, innovation labs, public sector innovation labs.

4.7.3 Inclusion and Exclusion Criteria

The study considered articles that contained information on public sector innovation labs and co-creation in public sector. The articles that were published by credible institutions were considered for the final analysis. Additional research and articles on the broader subject matter such as innovation, innovation in the public sector, and co-creation were also considered.

4.7.4 Ethical Considerations

Consent was obtained for the participants acceptance to participate in the research. Moreover, the respondents' names were omitted to maintain confidentiality of their views Additionally, their input was displayed without alterations to maintain the validity and reliability of the research.

4.7.5 Methodological Limitation

There are some methodological limitations for this research. Generally, the adoption and application of theory in qualitative research is a challenge to inexperienced or novice researchers that may yield inadequacies or improper application (Nguyen et al. 2022). And, as this research embarks on a novel undertheorized subject such as co-creation in public sector innovation labs, it is a challenge to adopt theoretical framework with high accuracy, without its underuse, misuse, or overuse in the analysis.

Another challenge is the use of qualitative Interpretative Phenomenological Analysis (IPA) research methodology, as there are certain constraints to this approach. The small sample size of five interviews may limit the generalizability of the findings of this research. The experiences and perceptions of a select group of leaders in the public sector innovation lab may not fully reflect the diverse experiences of their counterparts in other labs within different contexts.

Further, inherent in qualitative research, and particularly in IPA, is the potential issue of subjectivity. As this methodology relies heavily on participants' self-reports, interpretations are often influenced by their personal recollections, ability to articulate experiences, and the potential for recall bias. The researcher's preconceptions and biases, despite the effort to bracket them, could inadvertently shape the interpretation of data.

Moreover, while the use of semi-structured interviews as the primary data collection method employed in this research provides flexibility and depth, it still yields some limitations. The quality of the data obtained from the semi-structured interviews heavily relies on the responsiveness and openness of the participants, factors that the researcher

has limited control over. The Social Construction of Technology (SCOT) framework, while valuable in the analysis of interpretations, might not fully account for other influential factors such as economic aspects or policy implications.

Lastly, the limited timeframe combined with the intense time commitment required by implementing a qualitative research method, he IPA approach, and analysis might have constrained the overall scope of the research. With a greater timeframe, the scope of this research could have been expanded to more in-depth interviews with the participants or a comparative analysis of more than one innovation lab to validate the findings.

4.8 Research Setting

Research on the policy lab environment within the Canadian government is rather limited Moreover, Evans and Cheng 2021 describe research focusing on Canada that addresses the barriers to innovation within a provincial public service as “rare”. The phenomenon of innovation within the British Columbia (BC) public sector, a Canadian provincial setting, provides a critical backdrop to the context of this research. As discussed in Steen's report 2009, the BC public sector is actively engaged in enhancing its efficiency and effectiveness. Pressures for improved citizen services and cost minimization, impending workforce capacity reductions, and the need to uncover innovative solutions to persistent challenges underscore the demand for innovation.

An interesting aspect of the BC public sector's approach to innovation has been its attempts to nurture a culture of innovation, spearheaded by the Office of the Premier (Steen 2009). Following on from this exploration of innovation in the BC public sector, the BC Public Service, undergoing digital transformation, offers a fascinating context for this research (Remacle 2019). The progression of the innovation lab from the Continuous Service Improvement (CSI) Lab to the BC Developers' Exchange (BCDevExchange) or The Exchange Lab epitomizes the organizations commitment to innovation, co-creation and adaptation to the evolving digital landscape and provides an interesting setting for this research.

the three components of the processes within the Exchange Lab which are: people, process, and technology.

A central player in the BC public sector's innovative landscape is the Exchange Lab (Exchange Lab Operations n.d.). The Exchange Lab actively fosters the integration of digital practices in BC Public Service delivery. The Lab's methodologies, anchored in continuous improvement, are realized through various initiatives, including

comprehensive training programs, learning resource curation, and community-building initiatives (Exchange Lab Operations n.d.).

Figure 2 presents the overall connections and interrelations of the delivery model of the Exchange Lab.

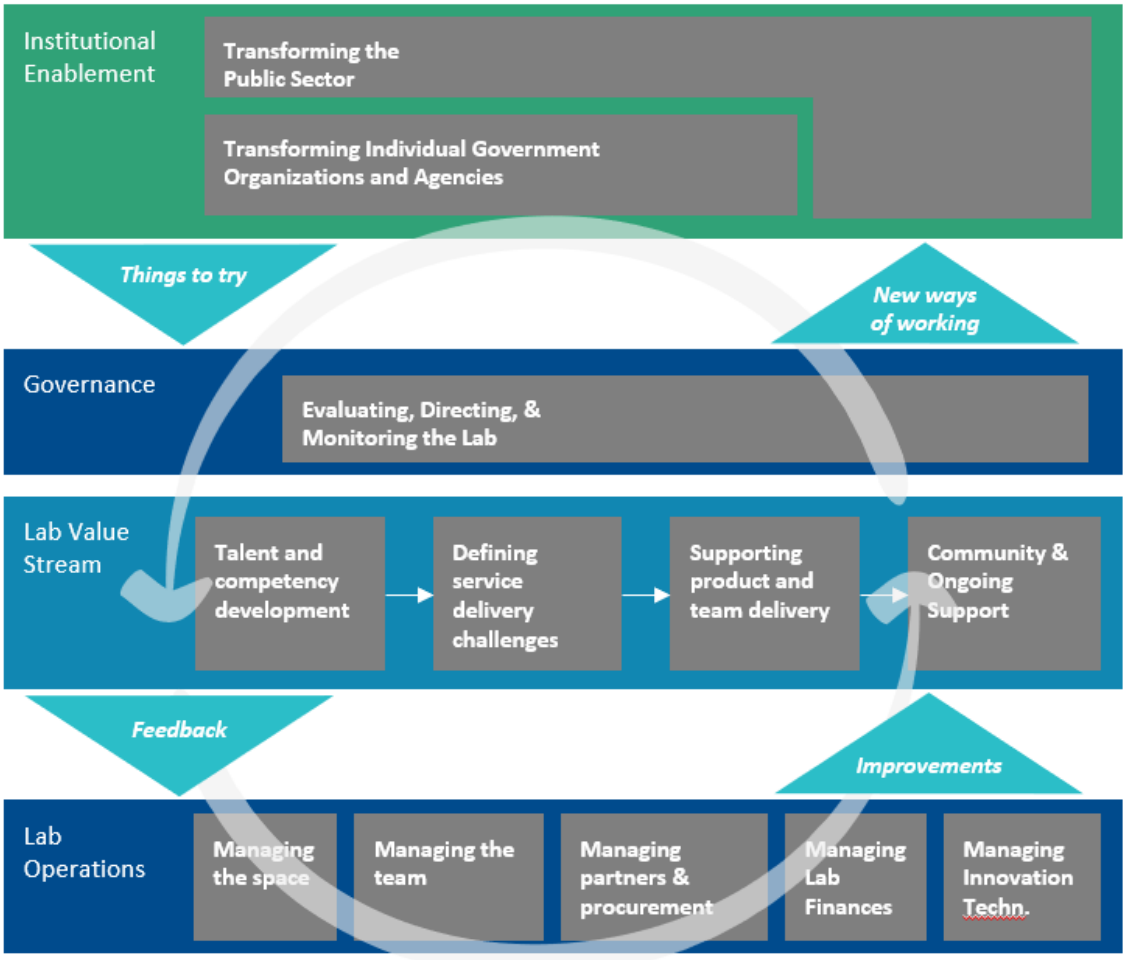

Figure 2: The Exchange Lab Delivery Model
Source: (Exchange Lab Operations n.d., P.1)

Finally, the Exchange Lab's impact is demonstrated in the digital products it has produced, which have enhanced the delivery of public services. The visible growth in the BC Public Service's digital delivery capacity, due in part to the Lab's capacity-building efforts, aligns with this research's central theme. Therefore, the Exchange Lab presents an interesting setting for examining the interplay between innovation, co-creation, within public sector innovation labs.

5 Findings

The research questions of this research are set to explore the interpretations of co-creation and perceptions of the use of co-creation in the context of public sector innovation labs. The first area of focus of this research is on how the interpretations of the leaders involved in co-creation activities within the public sector innovation labs influence their implementations of co-creation.

And the second area of focus of this research explores the perceived barriers to co-creation by these senior actors, with a sub area of exploration of their inputs on the requirements to address the identified barriers.

The theoretical framework of Social Construction of Technology (SCOT), in its first application by Bijker, outlines three areas that guide and support the exploration of the outlined questions in this research. The findings of the interviews are analyzed through applying the following three areas of SCOT: interpretative flexibility, stabilization and closure, and wider context (Bijker et al. 1987). The findings are then presented by section for each of the three elements of SCOT.

The analysis of findings drawn in this section will be further analyzed and linked to the literature in the subsequent **Section 6: Discussion**. The findings and discussion sections of the collected interview data lay the foundation to answer the research questions, address the goal of this research in the concluding and final section of this research as presented in **Section 7: Conclusion**.

Table 5 also presents a summary in this section to cluster the main ideas and key themes that emerged from the interviews on barriers.

5.1 Interpretative Flexibility

The multitude of interpretations of co-creation by various leaders in the public sector innovation lab demonstrates the degree of interpretive flexibility inherent in a technical artefact. High interpretative flexibility of co-creation would be areas where leaders have a high variation in interpretations of aspects of co-creation. While low interpretative flexibility of co-creation, would be areas where the leaders have less variation and more homogeneity in the interpretations of aspects of co-creation.

The following subsections 5.1.1 and 5.1.2 will present the analysis of the five interviews categorized by high and low interpretative flexibility of co-creation. The analysis of this question will yield answers to the first main research question of this research when combined with the analysis from the elements of stabilization and closure in sections 5.2.

5.1.1 High Interpretative flexibility of Co-creation

High interpretative flexibility presents the area where the interpretations are diverse. Each of the five leaders has a particular understanding of co-creation. These viewpoints appear to have the same focus on cooperation and the participation of various stakeholders, but their interpretations and applications of the notion of co-creation vary.

The variation of co-creation interpretations highlights the concept's adaptability and its use in a variety of organisational situations. While some interpretations place a strong emphasis on internal reorganisation and teamwork, others place an emphasis on fostering a sense of community, user involvement, or inclusivity. Despite these variations, all views concur that collaboration and the participation of various stakeholders in co-creation play a crucial role.

Even while the practical uses of co-creation may differ depending on the particular responsibilities and environments of these directors and ministers, this convergence shows a common understanding of its fundamental concepts.

In fact, every director sees co-creation as essential to modernization and innovation in their own special way. However, there are minute differences in their viewpoints that draw attention to their specific areas of interest and conceptual grasp.

For instance, the Executive Director and the Assistant Deputy Minister exhibit good alignment when discussing strategic transformation. In order to illustrate the importance of collaborative efforts in supporting organizational-wide transformation, the Executive Director emphasises that:

> *"co-creation is a mechanism for breaking down silos."*

Similar to this, the Assistant Deputy Minister emphasizes co-creation's importance in change management, saying that:

> *"co-creation is vital for aligning the people and technology to drive change."*

However, the Senior Director of Modernization Advisory Services and the Director of Digital Community and Engagement place a greater focus on the human element. They see co-creation as a way to promote a cooperative and dialogical culture. The Senior Director of Modernization Advisory Services argues that:

> *"co-creation is synonymous with community building,"*

whereas the Director of Digital Community claims that:

> *"co-creation is the key to enhancing interaction and cooperation among diverse teams."*

The Senior Director of the Digital Portfolio strikes a compromise between these two viewpoints and believes that co-creation is a complete instrument, stating that:

> *"co-creation involves all relevant stakeholders from the inception of a project."*

This point of view supports the necessity of including all viewpoints and encouraging an all-inclusive strategy. Though there are many different ways to read each phrase, they all highlight the importance of co-creation as an engine of invention and emphasise the importance of teamwork, inclusion, and user-centered design. Despite the differences in their methods, they all regard co-creation as essential to organisational modernization and transformation.

The five perspectives diverge significantly on several fronts while maintaining a common emphasis on collaboration and stakeholder participation. This divergence largely stems from their respective roles and functions within the organization.

The differences in their views also highlight the wide-ranging applicability and versatility of co-creation. As noted, the Executive Director sees co-creation as a tool primarily to prevent failures.

The Director of Digital Community and Engagement frames co-creation as a way to enhance knowledge sharing among teams. In contrast, the Senior Director Digital Portfolio conceives co-creation as a means to ensure alignment of project outcomes with the needs of those impacted, stating:

> *"Co-creation helps us ensure the solution fits the need."*

The Senior Director of Modernization Advisory Services underlines the community-centric and inclusive nature of co-creation, while the Assistant Deputy Minister perceives it as a crucial element of change management by describing it as:

> *"Co-creation is a critical aspect of change management."*

While all five leaders agree on the importance of collaboration and stakeholder participation in co-creation, they diverge in their focus. Some see co-creation as a way to shift roles and responsibilities, while others see it as a means to build community or bridge expertise.

Similarly, some view it as an inclusive or emergent process, while others see it as a tool for change management or a principle of user-centric design. These varying interpretations reflect the multifaceted nature of co-creation and its wide-ranging applications within organizational settings.

Based on the interviews, the following key areas emerge:

- The Focus on Structure

The Executive Director and the Assistant Deputy Minister both emphasize a significant shift in roles and responsibilities in their interpretation of co-creation. They differ, however, in the breadth of entities they consider for collaboration. The Executive Director focuses on internal changes, stressing a reconfiguration of roles between IT groups and business areas stating:

> *"The first is the switching up of the roles and responsibilities between IT groups and business areas."*

On the other hand, the Assistant Deputy Minister extends this collaboration beyond the organization's internal teams to include external technology companies:

> *"When you're using the term co-creation, are you talking with people or are you talking with technology companies?"*

- The Focus on Collaboration

The Director of Digital Community and Engagement and the Senior Director of the Digital Portfolio both emphasize collaboration among different teams. However, they diverge in their approaches towards how these collaborations should be structured and initiated.

The Director of Digital Community and Engagement sees co-creation as a way to spark interest among individuals in different fields and improve inter-team communication:

> *"How do we get other teams to talk to each other and share and help each other? And how do we get people who are not on teams to be interested in different fields like behavioral insights or security or lean or, or like there's, there's so many really brilliant areas in government."*

Meanwhile, the Senior Director of the Digital Portfolio takes a more structured approach towards co-creation, describing it as an iterative process that begins with identifying all impacted parties and progressively involves more individuals as the project unfolds:

> *"In my work, I think co-creation is where you find out who's impacted by your work and you invite them in at the beginning of the process to help you."*

- The Focus on Community

The Senior Director of Modernization Advisory Services sees co-creation as synonymous with building community, with an emphasis on equal influence among collaborators:

> *"Co-creation with my work at the lab, the first thing that comes to mind I would say is community...everyone has equal influence in those spaces."*

This interpretation contrasts with the Assistant Deputy Minister, who although underlining the importance of building trust and collaboration within internal stakeholders, doesn't explicitly link co-creation with community building:

> *"If we actually build something, build a new service in my group and we don't actually work with the data stewards across government on something that they're going to need, obviously they're not going to trust it."*

- The Focus on End-Users

There's a divergence in how the role of end-users is seen in the co-creation process. While the Senior Director, Modernization Advisory Services, views understanding the problem from the user's perspective as a starting point in the co-creation process:

> *"We might be taking a co-creation approach when we start from really discovering what the problem is from the user's perspective and then inviting the network of people who might be able to contribute to figuring out the best way to solve together."*

The Assistant Deputy Minister views the inclusion of users as an essential rather than a starting point, highlighting the crucial role users play throughout the process:

> *"I feel like it's table stakes at this point in time. Like, I don't understand how we can create anything without doing it with people."*

From this analysis, it's clear that while there is broad agreement on the importance of collaboration and the inclusion of various stakeholders, the way co-creation is interpreted and applied varies significantly among the different directors and ministers. The nuances of these interpretations are shaped by their individual roles and responsibilities, experiences, and the unique challenges they face in their work.

5.1.2 Low Interpretative flexibility of Co-creation

While the directors and ministers examined hold unique perspectives on co-creation, they all underscore the importance of multi-stakeholder collaboration in different ways. Their interpretations are analyzed below, combining their viewpoints into a comprehensive understanding of co-creation.

Firstly, the Executive Director interprets co-creation as a mechanism for dynamic interaction between traditionally siloed business and IT groups. The Director emphasizes that co-creation is about breaking down barriers and enhancing collaboration between these groups. This sentiment is echoed by the Director of Digital Community and Engagement who views co-creation as a process designed to stimulate interaction and collaboration among different teams, bridging gaps between areas of expertise.

The similarities in their interpretations are evident in the Executive Director's statement,

> *“Really just breaking down those barriers between what is traditionally a business area and traditionally an IT group,”*

and in the Director of Digital Community and Engagement's assertion,

> *“how do we get other teams to talk to each other and share and help each other?”*

The Senior Director of Digital Portfolio interprets co-creation from an inclusivity standpoint. For them, co-creation means involving all relevant stakeholders from the beginning, thereby incorporating diverse perspectives that are crucial for shaping the project's outcome. This interpretation aligns with the Senior Director of Modernization Advisory Services' understanding of co-creation as community-building, emphasizing equality of influence among collaborators. Both Directors underscore the idea that all voices should have a say in the creative process.

As the Senior Director of Digital Portfolio states,

> *"you find out who's impacted by your work and you invite them in at the beginning,"*

and the Senior Director of Modernization Advisory Services elaborates,

> *"everyone has equal influence in those spaces."*

Interestingly, the Assistant Deputy Minister brings a dual aspect of co-creation, emphasizing the importance of collaboration with people and technology companies. His

interpretation underscores the role of external collaboration in addition to internal teamwork. He also associates co-creation with change management, demonstrating the belief that co-creation is crucial for driving transformation in the organization. This perspective adds a strategic layer to the concept of co-creation, reinforcing its importance in managing and driving organizational change.

A common thread running through all these interpretations is the user-centric approach to co-creation. Each Director emphasizes the need to involve end users in the creative process, whether it is developing a product or designing a service.

This sentiment is clearly encapsulated in the Assistant Deputy Minister's statement,

> *"I don't understand how we can create anything without doing it with people," which echoes the Senior Director of Modernization Advisory Services' viewpoint, "we start from really discovering what the problem is from the user's perspective."*

Analyzing the interpretive flexibility of co-creation through the perspectives of the five directors reveals both commonalities and differences that highlight the adaptable nature of the concept.

At the core, all directors agree on key premises of co-creation: the collaboration necessity, barrier breakdown, stakeholder inclusion, and a focus on user-oriented solutions. These attributes resonate with the principle of co-creation being an inclusive and participatory process.

For example, collaboration emerges as a recurrent theme in the interpretations of the Executive Director, the Director of Digital Community and Engagement, and the Senior Director of Modernization Advisory Services. As the Executive Director states, co-creation is about,

> *"bringing diverse perspectives together to prevent costly failures"*

which showcases their view of co-creation as a tool for fostering interactions and breaking barriers between business and IT. In the same vein, the Director of Digital Community and Engagement stresses,

> *"the best ideas come when different teams come together and share their unique perspectives"*

which highlights the collaborative and knowledge-sharing aspects of co-creation.Further supporting this notion, the Senior Director of Modernization Advisory Services asserts,

"Co-creation is about community-centered approach to problem solving"

And that encompasses both collaboration and barrier breakdown.

The importance of inclusivity is stressed by both the Senior Director Digital Portfolio and the Assistant Deputy Minister. The former posits,

"We aim to involve people impacted by our work from the outset"

while the latter states,

"We must include the technology companies in our co-creation strategies."

Furthermore, the user-centric design process is emphasized by the Senior Director of Modernization Advisory Services and the Assistant Deputy Minister. The former suggests co-creation as an

> *"emergent process starting from understanding a problem from the user's perspective" and the latter frames it as a strategy for "improving products and services."*

After analyzing the interpretations of each actor of co-creation, it becomes apparent that there is diversity in interpretations. Following the first component of the SCOT framework, the interpretative flexibility, the areas of diverse perceptions among the actors becomes evident. These findings from the five interviews illustrate the flexibility of interpretation of co-creation among the different actors within the organization. These insights lay the foundation for further analysis of the stabilization and closure of co-creation in the subsequent sections.

5.2 Stabilization and Closure

Stabilization and Closure are two concepts that are closely intertwined, with interactions among leaders resulting in a gradual narrowing of various interpretations associated with the interpretations of co-creation.

The Stabilization concept pertains to the extent of an artifact's acceptance within a specific social collective. The stability of an artifact within a social group hinge on the consistency and uniformity of the meanings attributed to it by the group's members. Closure refers to how the diverse interpretations surrounding an artifact are homogenized and deemed uniform amongst the interviewed participants.

Closure is recognized when the interpretative flexibility tied to the artifact diminishes and with no further room for flexibility of interpretations.

5.2.1 Second Subsection on Third Level

High stabilization of the concept of co-creation is seen in the shared belief across all the directors that it requires breaking down silos and fostering a collaborative culture within the organization.

The interpretations of co-creation by leaders in public sector innovation labs influence the implementation of co-creation in multiple ways. These interpretations guide their strategies, define their practices, and shape the overall approach towards co-creation.

Firstly, there's a common thread of cross-disciplinary collaboration running through the interpretations and practices of all directors. The Executive Director emphasizes the need for bridging traditional business and IT groups, which is a clear call for cross-functional collaboration. This is echoed by the Director of Digital Community and Engagement when they mention creating opportunities for teams to engage with experts from different fields, and it's also reflected in the practice of the Senior Director, Modernization Advisory Services, who prioritizes creating networks and cross-functional teams.

And this is evident by looking into the following quotes:

Executive Director:

> *"breaking down those barriers between what is traditionally a business area and traditionally an IT group."*

Director of Digital Community and Engagement:

> *"Experts in residence was created for another coach, like a co-working area... that can work and help teams for 2 or 3 hours every Friday."*

Senior Director, Modernization Advisory Services:

> *"the focus is on cross functionality and solving complex problems."*

However, the way each director perceives and implements this cross-disciplinary approach differs, reflecting a high interpretive flexibility.

For the Executive Director, it's about embedding a business representative into IT teams. For the Director of Digital Community and Engagement, it takes the form of creating communities of practice and connecting different areas of expertise within the

organization. The Senior Director, Modernization Advisory Services, sees it in terms of building networks and creating a supportive ecosystem for digital delivery.

Secondly, there is a shared recognition of the need for external engagement and feedback in the co-creation process. Both the Director of Digital Community and Engagement and the Senior Director Digital Portfolio emphasize the importance of reaching out to and involving external stakeholders.

Director of Digital Community and Engagement stated that:

> *"Our live stream that goes every month is open for everyone. And so, okay, so back up to the tour, especially before COVID, we'd have people all over the world coming to that tour."*

Moreover, Senior Director Digital Portfolio stated that:

> *"we decided anyway that we were going to reach out to the people that would be the ones like fingers on keyboards actually using the service and find out how we could make it better for them"*

But the approaches taken by these two directors in implementing this engagement with external stakeholders have differences that denote high interpretive flexibility.

The Director of Digital Community and Engagement looks towards a wide, inclusive approach, welcoming anyone to join their tours or live streams, aiming for transparency and openness. Whilst, the Senior Director Digital Portfolio, on the other hand, takes a more targeted approach, focusing on the actual end-users of their services and looking for ways to improve their specific experiences.

Overall, while these directors share some common threads in their interpretation and implementation of co-creation, their unique contexts and roles have led to different approaches, reflecting the high interpretive flexibility of the concept of co-creation.

5.2.2 Low stabilization

In terms of low stabilization (or high interpretative flexibility), there are varying perspectives and unique applications that each director expressed.

Guiding Strategy and Direction:

The way leaders perceive and understand co-creation often shapes the strategic direction they take in implementing it. For instance, the Executive Director perceives co-creation

as the merging of business and IT domains, which sets a strategic direction of integrating business domain knowledge with technical expertise. This is reflected in their approach of embedding a full-time product owner from the business area into the IT team. They state:

> *"One of the ways is that we ask for a full time dedicated product owner from the business area to lead our teams...It's one of the pieces that is probably the hardest for business areas and groups to understand."*

The strategy emerges directly from their interpretation of co-creation, aiming to blur traditional organizational boundaries and foster a unified approach towards digital transformation.

Informing Practices:

The interpretations of leaders also shape the practices around co-creation. The Senior Director Digital Portfolio's emphasis on user involvement and user feedback in co-creation reflects in their approach to development. Their statement:

> *"we were going to reach out to the people that would be the ones like fingers on keyboards actually using the service and find out how we could make it better for them"*

shows how their interpretation informed the practice of user-centered design and iterative development, where user feedback drives development decisions.

Shaping Culture:

Leaders' interpretations also contribute to creating a culture of co-creation within the lab. When leaders emphasize values such as collaboration, transparency, and engagement with external stakeholders, they foster a culture that supports these practices. The Director of Digital Community and Engagement's interpretation of co-creation is focused on knowledge sharing and collective learning. Their initiatives, such as communities of practice and 'expert in residence' programs, are practical embodiments of their interpretation.

These initiatives foster a culture of collective learning and active participation, as evidenced by their statement:

> *"My team's constantly always trying to find more and more ways to get people to co-create. And a few years ago, we started really investing our time in communities of practice."*

Influencing Outcomes:

The leaders' interpretations of co-creation can also significantly impact the outcomes of co-creation efforts. For instance, the Senior Director, Modernization Advisory Services's emphasis on building networks and creating a healthy ecosystem for digital delivery reflects their view of co-creation as a cross-functional, complex problem-solving endeavor. This is evident from their statement:

> *"So that's really where the focus on agile delivery and delivery teams came in because the focus is on cross functionality and solving complex problems."*

This approach not only affects the process of co-creation but can also lead to more comprehensive, inclusive, and effective solutions.

Aligning Interpretations and Implementations:

A significant aspect of the influence of leaders' interpretations on co-creation implementation is the alignment (or misalignment) between these interpretations and the actual practices. The Senior Director Digital Portfolio's experience serves as a case in point. They noticed a discrepancy between their interpretation of co-creation as a user-centric process and the practice of relying on expert knowledge to drive development. As a result, they undertook a pivot in their approach, highlighting how interpretations can directly lead to changes in co-creation practices:

> *"We went into a significant pivot. We changed what we were working on. The outcomes were great and all, and you know, we could have spent a lot of money building something that we actually didn't need to build if we hadn't have done that."*

While there is a general agreement on the fundamentals of co-creation across all directors, the practical applications and nuances vary, indicating a high level of interpretative flexibility. Each interpretation and application is shaped by their unique roles, context, and focus, whether it's user engagement, breaking down silos, or fostering a collaborative ecosystem.

In conclusion, the leaders' interpretations of co-creation play a profound role in shaping the implementation of co-creation in public sector innovation labs. From determining strategic direction to shaping practices, informing culture, influencing outcomes, and aligning the practice with theory, the leaders' interpretations guide and shape the co-creation landscape within their respective domains.

5.2.3 Closure

Cross-functional Collaboration: The idea that a blend of skills and expertise is essential for successful co-creation appears to be a shared understanding. Looking at the areas of closure identified among the leaders' interpretations of co-creation, namely "Cross-functional Collaboration" and "User or Stakeholder Involvement," it is evident how these interpretations directly affect the practical implementation of co-creation.

The shared belief that a diverse blend of skills and expertise is vital for successful co-creation has shaped the operational practices of the leaders.

Executive Director: Their belief in cross-functional collaboration has resulted in an implementation process where dedicated product owners are integrated into the teams. This ensures that various perspectives are considered in their digital transformation work, thus bridging the traditional gaps between business areas and IT groups.

Director of Digital Community and Engagement: Their co-creation implementation strategy includes establishing communities of practice and inviting experts to provide guidance to teams, thus fostering a culture of shared learning and collaboration.

Senior Director, Modernization Advisory Services: Their focus on agile delivery and delivery teams with diverse skills informs their approach to structuring the teams in the Exchange Lab, which is designed to promote cross-functional problem-solving and support a healthy ecosystem for digital delivery.

User or Stakeholder Involvement:

All leaders demonstrate a strong commitment to involving end-users or other relevant stakeholders in the co-creation process, and this is evident in their respective implementation approaches.

Executive Director: Their belief in stakeholder involvement is manifested in the practice of placing business area representatives and IT groups together, facilitating quick responses to various questions and inputs from the business perspective.

Director of Digital Community and Engagement: Their implementation of co-creation involves creating avenues for teams to engage with experts in different areas, emphasizing the importance of bringing the user perspective into the co-creation process.

Senior Director Digital Portfolio: Their commitment to user involvement is seen in their willingness to engage directly with users, even in a challenging project. This direct user

feedback has resulted in significant product pivots, demonstrating the impact of user involvement on shaping the implementation process.

These examples show that the areas of closure in the leaders' interpretations of co-creation significantly influence how they implement co-creation within their scope of work. The consistency of their interpretations ensures that the co-creation process across different areas remains aligned and effective, fostering a culture of collaboration and user-centric design.

5.3 Wider Context

The Wider Context considers the broader environment in which co-creation development takes place and can significantly influence how closure and stabilization processes is implemented.

The interpretations of co-creation along with the perspectives on co-creation process from the interviews provide about the wider context of co-creation in the public sector innovation lab. The information and details provided by interviewees are further enriched with the responses of the interviewees to the question on the barriers.

Based on the interviews, several barriers in the wider context have been identified by the leaders in public sector innovation labs, impacting both their interpretations and implementation of co-creation. These barriers fall into the following categories: resource constraints, structural and cultural challenges, scaling and complexity, and individual perceptions and attitudes.

Resource Constraints:

The Executive Director emphasizes the financial limitations, pointing out:

> *"The piece of financial reform is highlighted. The limitations within budget and program funding of project versus operation funds constitute a barrier to co-creation."*

This perceived barrier can influence the implementation of co-creation by necessitating a strategic allocation of scarce resources, leading to an implementation of co-creation that has to fit within a tightly controlled budgetary framework.

Structural and Cultural Challenges:

Both the Senior Director of Modernization Advisory Services and the Assistant Deputy Minister mention structural and cultural barriers, with the former stating:

> *"Defined mandates and hierarchies as barriers."*

and the latter identifying:

> *"Organizational structure and mandate areas" as well as "competing government priorities."*

These interpretations can result in a more cautious implementation of co-creation due to the entrenched hierarchies and rigid mandates that pose challenges to innovative practices.

Scale and Complexity:

The Director of Digital Community and Engagement acknowledges the challenges associated with scaling co-creation efforts:

> *“I used to know every product. There's probably so many products that I just many products, more products that I don't know than I do know of right now.”*

This interpretation can influence the implementation by causing a shift in focus from pure co-creation to also managing the complexities that arise with scaling, thus possibly constraining the scope of co-creation.

Individual Perceptions and Attitudes:

The Senior Director of Modernization Advisory Services indicates personal biases and preconceived notions:

> *"The biases and preconceived notions of public servants which leads to their own perspectives and assumptions interference with effective co-creation."*

Additionally, the Director of Digital Community and Engagement mentions:

> *"risk and technology averseness of leaders and the range of negative attitudes towards it."*

These barriers can cause leaders to interpret co-creation as a high-risk strategy, leading to cautious, incremental implementations, rather than radical innovation.

The interviewees' identification of the following barriers enriches the research findings of the wider context where their interpretations on co-creation and their perspectives emanate.

In the Executive Director's interview, the piece of financial reform is highlighted. The limitations within budget and program funding of project versus operation funds constitute a barrier to co-creation. Another barrier is the relationship between two groups: the IT teams and non-IT teams.

The Director of Digital Community and Engagement expressed that scaling co-creation efforts may pose a challenge and barrier as scaling increases complexity which may hinder co-creation. Another barrier is risk and technology averseness of leaders and the range of negative attitudes towards it.

While the Senior Director of Digital Portfolio stressed on the importance of resilience in the face of political pressures as they constitute a barrier to co-creation. Due to these influences, co-creation may be performative and not necessarily implemented. Another barrier is the stress on the teams involved in co creation as a result of hearing complaints, empathy and compassion.

Moreover, the Senior Director of Modernization Advisory Services identified defined mandates and hierarchies as barriers. Also added that the government's linear approach limits their capacity to involvement in co-creation. Another key aspect highlighted is the biases and preconceived notions of public servants which leads to their own perspectives and assumptions interference with effective co-creation.

And lastly, the Assistant Deputy Minister's interview offered a perspective on the barriers that hinder the widespread adoption of co-creation by identifying barriers that include the gap in skill sets between junior public servants and seniors, the shortage of experts in co-creation, competing government priorities, organizational structure and mandate areas, and the balancing of high-profile policy priorities.

These barriers, as perceived by the leaders in public sector innovation labs, shape their interpretations and implementations of co-creation. The limitations they present require these leaders to adapt their approach to co-creation to the realities of their context, leading to implementations that might be narrower in scope, more cautious, or more focused on managing complexities than would be the case in an ideal scenario.

Table 5 summarizes the wide context barriers perceived by each of the five interviewees.

Interviewee	**Perceived Barriers**
Executive Director	● Project financing and budget allocation ● Anger and high level of distrust between IT and non-IT groups.
Director of Digital Community and Engagement	● Scaling ● Mixed attitudes and views on co-creation ● Technology and change averseness
Senior Director Digital Portfolio	● Competing political priorities and pressures ● Empathy fatigue
Senior Director, Modernization Advisory Services	● Fixed mindsets of public servants ● Linear approach of government ● Inconsistent modes of engagement ● Limitation of the extent of user involvement in co-creation. ● Biases and preconceived notions impact co-creation efforts.
Assistant Deputy Minister	● Knowledge gap and lack of awareness among senior personnel. ● Scarcity of skills for code co-creation and development. ● Poor prioritization of co-creation projects. ● Co-creation overshadowed by high-profile policy priorities. ● ADMs have influence but lack buy-in for co-creation. ● Performative stakeholder engagement.

Table 5: Summary of Perceived Barriers by Interviewed Leaders
Source: Author's own illustration

The contextual barriers, as identified by the leaders of public sector innovation labs, play a role in shaping their interpretations and implementations of co-creation in the following areas.

Scale and complexity:

As expressed by the Director of Digital Community and Engagement, as an organization grows, maintaining a consistent approach to co-creation becomes increasingly challenging. The complexity increases with the number of projects and teams involved in co-creation, and this can lead to disconnect and dilution in the implementation of co-creation. As they state,

"There's probably so many products that I just many products, more products that I don't know than I do know of right now."

Financial limitations and team dynamics:

The Executive Director underscores the challenge of financial constraints and differences between IT and non-IT teams as significant barriers. Limited budgeting and program funding for co-creation projects can restrict the scope and effectiveness of co-creation initiatives. Additionally, differences in perspectives and communication styles between IT and non-IT teams can lead to misunderstandings and hinder the successful implementation of co-creation.

Political pressures and emotional stress:

The Senior Director of Digital Portfolio brings attention to the barrier of political pressures, which can make co-creation appear performative rather than genuinely implemented. The emotional stress on teams involved in co-creation due to hearing complaints and the need for empathy and compassion can also impact the effectiveness of co-creation processes.

Defined mandates and hierarchies, and government's linear approach:

The Senior Director of Modernization Advisory Services identifies the rigid mandates and hierarchies within the government as barriers to co-creation. These structural limitations can stifle the freedom necessary for successful co-creation, leading to a limited implementation of co-creation.

Skills gap and organizational structure:

Lastly, the Assistant Deputy Minister points out the skills gap among junior public servants, the shortage of co-creation experts, competing government priorities, and the rigidity of the organizational structure as significant barriers. These challenges can impede the interpretation and implementation of co-creation in meaningful ways.

Hence, the contextual barriers identified by the leaders impact their interpretations and the implementation of co-creation by introducing challenges that can restrict the communication, scope, and effectiveness of co-creation processes. These barriers influence how the concept of co-creation is understood and practiced in public sector innovation labs.

6 Discussion

The study of interpretations and implementations of co-creation by leaders in public sector innovation labs has yielded a rich understanding of the complexities and nuances of this practice within the government innovation lab context. Using the Social Construction of Technology (SCOT) perspective to examine this phenomenon has revealed various interpretive flexibilities, different levels of stabilization, and the occurrence of closure across the five director's interviews.

The findings indicate that the interpretations of co-creation among the leaders vary, demonstrating a high degree of interpretive flexibility. Some leaders see co-creation as an essential democratic process, while others perceive it as a methodology for problem-solving or product development. These diverse interpretations influence how co-creation is implemented, affecting the strategies adopted, the resources allocated, and the measures taken to encourage co-creation.

The leaders also highlighted numerous contextual barriers impacting their interpretations and implementation of co-creation. From scalability challenges to risk aversion, political pressures, and resource constraints, these barriers provide a nuanced understanding of the real-world challenges that affect the practice of co-creation.

When it comes to overcoming these barriers, the leaders emphasized the need for lean governance structures, more people involved in co-creation, risk acceptance, adaptability, access to talent, and a mandate for co-creation as critical requirements. These solutions, however, are not isolated from each other and can often be intertwined, addressing multiple barriers simultaneously.

The perceived barriers and the suggested requirements to overcome them showcase a clear tension between the ideal and the real, the aspirational and the practical. The directors' interpretations, shaped by their experiences and organizational contexts, influence their implementation strategies. They also affect their perceptions of barriers and the resources they identify as necessary for effective co-creation.

Understanding these connections provides valuable insights into the dynamics of co-creation in government innovation labs. It sheds light on how leaders navigate challenges, make strategic decisions, and employ resources to foster a culture of co-creation. This understanding is not just crucial for innovation labs, but also for wider governmental organizations as they seek to enhance their co-creative capacities.

These findings also underscore the importance of using SCOT as an analytical lens in studying co-creation. SCOT has helped illuminate the interpretive flexibility of co-

creation, the role of contextual barriers in shaping interpretations and implementations, and the possible areas of closure across the different leaders' views. It has demonstrated how co-creation, as a technological practice, is socially constructed, contingent on various social and contextual factors.

The Social Construction of Technology (SCOT) model has facilitated a deeper understanding of the process of co-creation in public sector innovation labs by focusing on the interpretations, implementations, and perceived barriers to co-creation as experienced by the leaders in these labs. It's important to understand how SCOT, with its emphasis on interpretative flexibility, stabilization, and closure, has aided this research.

By using SCOT, which acknowledges the role of social interactions in shaping artifacts, the results of this study could be used to address and cross pollinate the following areas of research gaps of literature: The need for combining innovation and Socio-technical studies, the need to contribute to the understanding of the vaguely defined concept of co-creation, and the need to focus on staff as understudied group in PSIL.

The main subject of SCOT is the technology or the artifact. In terms of SCOT, an artifact does not only apply to a physical artifact or technology application, but also it refers to processes. In the scope of this research, co-creation is the artifact analyzed by SCOT. While co-creation is a process rather than a physical artifact, it is highly relevant to the framework as it is a process of technology development that involves different actors and consequently is constructed by their interpretations.

Interpretative flexibility:

Here, the leaders of the public sector innovation labs are the relevant social group. SCOT's lens of interpretative flexibility enabled the research to explore and articulate the different ways in which these leaders interpret co-creation.

By understanding these different interpretations, we can start to see how they influence the implementation of co-creation in their respective labs. The different interpretations of co-creation also open the way to discuss and address the perceived barriers in the wider context that impact their interpretations and implementation of co-creation.

Stabilization and closure:

Over time, a technology (or process) can stabilize as social groups reach a point of closure or consensus around a dominant design or interpretation. In this research, the interviews revealed certain common threads and trends across the different leaders' interpretations of co-creation, indicating a degree of stabilization.

For instance, all leaders view co-creation as a collaborative process that fosters better decision-making and outcomes. These areas of closure directly influence how co-creation is implemented in their labs.

Perceived barriers and overcoming them:

SCOT also helps illuminate how contextual barriers impact the interpretations and implementation of co-creation. By identifying these barriers - such as resource limitations, risk aversion, or bureaucratic structures - we can start to understand the wider social and institutional forces that shape how co-creation is enacted in public sector innovation labs. SCOT also directs attention to the key resources and strategies identified by leaders to overcome these barriers, offering insights into how co-creation can be further enhanced in these settings.

By applying the SCOT model, this research has been able to delve deeper into the social and contextual dynamics shaping co-creation in public sector innovation labs, offering a richer and more nuanced understanding of this complex process.

The leaders in public sector innovation labs identified several key resources or requirements that they believe are necessary to overcome the perceived barriers and enhance the implementation of co-creation. The relation between these requirements and the barriers can be elaborated as follows:

Lean governance structures:

In response to the barrier of complexity due to scale, the Assistant Deputy Minister talks about the need for

> *"lean governance structures."*

They mention that such structures can help make decisions quickly and keep the teams moving, reducing the disconnect and confusion arising from a large number of products and projects. It's an attempt to streamline decision-making and reduce bureaucratic obstacles, making co-creation easier to implement across a growing organization.

More people, diversity and collaboration:

Director of Digital Community and Engagement mentions "having more people" and fostering collaboration amongst the teams as key requirements. The idea is to overcome the barriers of scale, team dynamics, and skills gap. More people involved means more ideas, broader skillsets and perspectives, and a better ability to handle multiple co-creation projects simultaneously. More collaboration ensures better communication and

mutual understanding, reducing conflicts and facilitating better implementation of co-creation.

Risk acceptance and resilience:

Senior Director of Digital Portfolio brings up the need to accept the risk of announcing projects early to the public and the requirement for resilience against political pressures. These can help to overcome the barriers of risk aversion, political pressures, and the government's linear approach. Being open to the public from an early stage fosters trust, allows for co-creation from the start, and can make it easier to absorb and manage negative feedback.

Access to talent and adaptability:

The Senior Director of Modernization Advisory Services talks about the necessity of having access to talented individuals who understand the need for adapting to constant change and are willing to facilitate group processes. This can help address the barriers related to the skills gap and the stress on teams involved in co-creation. With a talented and adaptable team, organizations can better navigate the challenges of implementing co-creation.

Making co-creation a mandate:

The Assistant Deputy Minister mentions making co-creation a part of everyone's mandate and having it driven out of a Premier's office as key requirements. This can overcome the barrier of competing government priorities and defined mandates, ensuring co-creation is given the importance and resources it deserves, and is integrated into the standard processes of the government.

Thus, these key requirements or resources identified by the leaders directly address the barriers to co-creation. They represent potential solutions to enhance the implementation of co-creation in the face of these challenges. However, their effectiveness would still largely depend on the specific contexts of the innovation labs and the wider government framework in which they operate.

6.1 Discussion of Research Questions

Each leader, based on their understanding and interpretation, implements co-creation differently in their respective areas.

For instance, the Executive Director interprets co-creation as breaking down barriers between IT and business. This interpretation directly shapes the implementation by

integrating a dedicated product owner from the business side in the IT team to enhance communication and decision-making. This is an example of how interpretation (understanding of co-creation) directly informs and shapes the implementation (integration of product owner in the team).

- How Stabilization influences implementation:

Stabilization occurs when there's a common understanding or consensus among the leaders about the concept of co-creation. The common threads across interpretations, despite their nuances, set a uniform foundational basis for implementation.

For instance, the shared understanding of co-creation as a collaborative process means that each director, regardless of their specific interpretation, incorporates elements of collaboration into their implementation strategies. Therefore, the stabilization around this aspect of co-creation shapes the implementation by mandating cross-functional collaboration across different teams, as seen in the Executive Director's and the Assistant Deputy Minister's implementations.

- How Closure influences implementation:

Closure happens when all leaders agree on a certain aspect of the interpretation of co-creation. This agreement provides clear guidelines for implementation.

One area of closure is the recognition of the importance of stakeholder engagement in co-creation. This consensus interpretation affects the implementation by making user or stakeholder feedback a central element in all co-creation practices across directorates. The Senior Director of the Digital Portfolio's practice of reaching out to users to make the service better reflects this shared interpretation in action.

Hence, the "how" lies in the direct translation of the interpretations of co-creation into their implementations. The interpretations provide a roadmap that guides how co-creation is practiced - be it through the unique implementations drawn from interpretative flexibility, the shared practices originating from stabilization, or the universally adopted strategies that stem from closure.

- The key requirements and resources necessary to overcome perceived barriers and enhance the implementation of co-creation, as identified by leaders in public sector innovation labs, revolve around several interconnected themes. Delving deeper into these themes, richer connections between the insights become evident

Streamlined Decision-Making Process and Autonomy:

The Executive Director emphasizes the crucial role of lean governance structures and decision-making autonomy in overcoming bureaucratic hurdles. This sentiment is echoed by the Assistant Deputy Minister, who talks about co-creation being driven out of a Premier's office. There is a shared understanding that decision-making should be as decentralized as possible to enhance the speed and efficiency of operations.

> *“lean governance structures are. Very difficult to achieve in government because everybody usually wants to be involved in all the decisions.”*

Assistant Deputy Minister:

> *"Co-creation being driven out of a Premier's office."*

Human Resources and Expertise:

The need for more people capable of performing the work is highlighted by both Director of Digital Community and Engagement and The Senior Director of Modernization Advisory Services

The Director of Digital Community and Engagement talks about the challenge of managing a growing team and maintaining the consistency of openness. On the other hand, The Senior Director of Modernization Advisory Services focuses on the need for talented individuals who are comfortable with constant change and complexity.

The Director of Digital Community and Engagement:

> *“Having more people do this work. That would be more concise language. More people starting up labs like a product teams to create products.”*

The Senior Director of Modernization Advisory Services:

> *"having access to the talent, to people who understand the need for, um, adapting to constant change, to working in complexity."*

Risk Tolerance and Resilience:

Matthew's insights resonate with the need for risk tolerance and resilience, a sentiment subtly reflected by Catherine when she talks about navigating tricky situations quickly, especially during a crisis like COVID-19. This shared perspective suggests that embracing risks and demonstrating resilience in the face of challenges are essential aspects of co-creation implementation.

Senior Director of Digital Portfolio:

> *“they have to accept risk of letting the business, letting the public or the end users, the impacted parties know that you're planning a project before it's announced and ready.”*

Executive Director:

> *"...we were able to navigate some of those trickier, complicated situations very quickly, especially during COVID because a pandemic helps."*

Collaboration and Co-Creation Mandates:

The Assistant Deputy Minister highlights the need for enforced collaboration and the integration of co-creation into everyone's mandate. This sentiment is mirrored by The Senior Director of Modernization Advisory Services, who talks about navigating the government, which is implicitly about fostering collaboration within a complex bureaucracy. Moreover, Director of Digital Community and Engagement stress on starting up more labs also implies fostering more spaces where collaboration can occur.

Assistant Deputy Minister:

> *"to make it part of everybody's mandate...how we build out teams is kind of. A requirement of me in my role is that I actually enforce collaboration amongst my teams."*

The Senior Director of Modernization Advisory Services:

> *"...to be willing to come forward with a set of tools, including facilitating group process and navigating government."*

Director of Digital Community and Engagement

> *"More people starting up labs like a product teams to create products."*

In essence, these leaders view the elimination of barriers and the enhancement of co-creation implementation as a multi-faceted endeavor. The challenge encompasses the need to restructure governance, enhance human resources and expertise, foster a culture of risk tolerance and resilience, and promote collaboration while integrating co-creation into the daily work of public sector entities. It's evident that these requirements and resources are deeply interlinked, with advancements in one area likely to stimulate improvements in others.

These findings provide a holistic understanding of the perceptions, applications, benefits, challenges, and potential areas of improvement regarding co-creation within the context of the public sector. The key findings outlined below are validated through the author's triangulation, by drawing on relevance to the reviewed literature in chapter 2 of this research.

6.2 Discussion of Key Findings

- The first key finding is that the importance of co-creation is uncontested.

And that is highly evident in both the literature and the participants' interviews. Whereby, all participants highlighted its importance and expressed it in diverse ways pertaining to their work to the users themselves and the organization at large.

- The second key finding is that a uniform interpretation of co-creation ceases to exist.

As highlighted in the literature review. The term co-creation is broad, is applied in numerous areas and is executed in a multitude of ways.

- The third key finding is the erroneous interchangeability of co-creation.

As the literature on co-creation suggests, the term co-creation is falsely used interchangeably with other terms such as collaboration. This is also evident and had emerged during the research interviews whereby the Senior Director of Digital Portfolio referred to "co-production" and weaved it into the conversation about co-creation multiple times.

By mentioning this finding, it is worth noting that one interviewee, the Senior Director of Service Modernization, drew a solid distinction between co-creation and other activities that involve users such as consultations, community networks, and user research. The interviewee specifically stated that many of the processes that take place within the organization are not strictly co-creation but there are still other forms of valuable user inputs.

- Co-creation is subject to wider context barriers:

Several challenges were identified regarding the implementation of co-creation in the government. These challenges included the need for cultural shifts, overcoming resistance to change, addressing power imbalances, fostering collaboration across silos, acquiring necessary skills and capacity, and effectively managing resources and time constraints.

The interviewees also mentioned the challenge of aligning co-creation efforts with existing mandates and hierarchies.

- Organizational structures make or break co-creation:

The importance of leadership support and organizational structures that foster co-creation was emphasized. The role of champions, dedicated units or labs, and senior-level buy-in was seen as crucial for mainstreaming co-creation practices within government agencies. The need for training and education to build awareness and capacity among public servants, particularly at senior levels, was also highlighted. Success Factors: Several success factors for effective co-creation were identified. These included the establishment of clear objectives, meaningful engagement with diverse stakeholders, trust-building measures, access to resources and expertise, effective communication and knowledge sharing, flexibility and adaptability.

The interviews highlighted areas where improvement is needed to enhance co-creation practices. These included addressing barriers such as risk aversion and resistance to change, improving coordination and collaboration across government departments, fostering a supportive organizational culture, integrating co-creation into policy development cycles, and addressing the challenges associated with scalability and sustainability.

6.3 Limitations

This section outlines the number of underlying limitations encountered by the researcher during this research, and how the researcher mitigated them throughout the course of the research inquiry.

The first limitation is the SCOT framework. The first formulation of the framework was introduced in 1984 by Pinch and Bijker and was later adapted by a number of scholars to evolve with the subject matter and to apply to different, and more sophisticated modern contexts. While from the start, the firstly developed framework was sufficient to address the research goals and answer the questions. The researcher still worked to ensure that the research goals, question, and literature stay within the scope of the three elements.

Another limitation, which may be the first obvious for the readers, is the reference to the term “technology” in this framework. It may be confusing for the reader and was confusing for the researcher as well in early stages of this research. While the term “technology” in the title may indicate that the framework is to be applied to the study of a certain technology, it in fact could apply to both a technology or a process.

Hence, it was not surprising for the researcher that the majority of studies utilizing SCOT, especially in the public sector, examine technology applications or devices as an artifact.

Only very few studies, employed SCOT to examine a process rather than physical technology or a technology application. To mitigate this limitation, the researcher expanded the and supported by literature from both Elle et. Al 2010 and Yousifkah 2017 as well as Pinch and Bijker's 1984 book where the same formulation of this study is introduced.

The second limitation concerns interviewees. Identifying the most suitable interviewees within the niche speciality of innovation labs in the public sector was challenging for the researcher. The complexity was further escalated, given the target actors group are the top senior staff within the innovation lab.

Moreover, the interviewees were identified by "follow the actor" process as recommended by Pinch and Bijker' book in 1984.

Another limitation related to the sample size or number. Whereby the researcher strived to ensure that the interviews were in depth that are semi-structured, examples and use of extensive quotes and a dedicated section to present each interviewees perspective. Semi-structured interviews rather than a strict, sequenced list of questions allowed for rich information.

The third limitation was the scarcity of literature on the topic or research question. The topic of innovation in the public sector is novel, even further scarce is the topic of public sector innovation labs.

Since the research question is interdisciplinary and there were no works found in literature, or that the researcher was aware of in literature, that simultaneously addressed the three subjects of perspectives of leaders of different departments, in public sector innovation labs on co-creation.

The researcher addressed this limitation by examining works that examine each concept solely, then two out of the three and drawing on similarities and understanding the approach. And hence, decided on SCOT and confirmed its application to process not just artifacts. And by strictly adhering to it.

7 Conclusion

The public sector grapples with a multitude of challenges, most of which arise from resource restrictions and escalating expectations for the standard and accessibility of public services. The existing traditional approaches are often inadequate to address the increasingly intricate problems communities confront. This has necessitated innovative methods, solutions, and strategies within the public sector, setting the stage for the rise of public sector innovation as a vital focus area.

The significance of innovation in the public sector was recognized as a potent catalyst for improving public service delivery and addressing grand societal challenges. The leaders within PSILs were identified as crucial actors, given their substantial influence on the perceived reality of other organizational members. Their interpretations of co-creation significantly impacted its implementation, elucidating the role of leaders as pivotal facilitators in the innovation process. The concept of collaborative leadership emerged as a key attribute in spearheading the adoption of innovative initiatives within PSILs.

In the context of the evolving research on public sector innovation, this research examined the dynamics of co-creation within Public Sector Innovation Labs (PSILs) through the lenses of the Social Construction of Technology (SCOT). The research sought to fill gaps in understanding how leaders within PSILs interpret and implement co-creation, identify perceived barriers, and suggest potential resources to eliminate the barriers and streamline the interpretations and implementation of co-creation.

The research journey undertaken in this study aimed at unraveling the complex weave of co-creation in the context of public sector innovation labs (PSILs). It sought to answer specific research questions. How do leaders in PSILs interpret co-creation, and how do these interpretations influence its implementation? What perceived barriers hinder these interpretations and implementation of co-creation? And what resources are necessary to overcome these barriers?

With SCOT as a guiding lens of the analysis, this research explored how various leaders within the PSILs interpret and implement co-creation. The incorporation of SCOT in this research process revealed the malleability of the term co-creation which was shaped by varying interpretations, knowledge levels, and power dynamics among stakeholders.

The findings of this research contribute to the understanding of the role and limitations of leaders' interpretations within PSILs in fostering co-creation in public sector services.

Despite the growing influence and recognition of PSILs in advancing innovative approaches like co-creation, co-design, and co-production, the academic understanding

of their functioning and impact has been limited. This research has brought a spotlight on the role of PSILs and provided a comprehensive analysis of barriers experienced by leaders, thereby addressing a gap in current literature highlighted by (Wellstead et al. 2021).

This exploration has elucidated several key findings. First, the interpretation of co-creation by leaders has a substantial impact on the implementation process. Ambiguities in the conceptual understanding of co-creation and its definition form a significant barrier in this respect, affecting not only the practical implementation but also the progression of research in this field.

The varying interpretations of co-creation by different stakeholders within the organizations add a layer of complexity. These divergent interpretations could lead to misunderstandings and ambiguity, hence a common language to communicate objectives and concepts within organizations is of utmost importance.

The presence of diverse interests, knowledge levels, and power dynamics among stakeholders also presents challenges to the co-creation initiatives. These factors can shape both the initial conditions and the final outcomes of the co-creation processes, making it crucial to comprehend and navigate these dynamics effectively.

The study further revealed the limited scholarly attention given to PSILs. Despite being closely associated with co-creation, co-design, and co-production, a lack of comprehensive research on their functioning, impact, and the unique challenges they face was identified. This knowledge gap is an important area for future exploration, and this research has aimed to contribute towards filling this void.

In unearthing the dynamics of co-creation within PSILs, this research uncovered the unique challenges that this area presents.

To overcome the identified barriers, leaders have suggested several key resources, including a clear and shared definition of co-creation, a common language for communication within organizations, and an inclusive and participatory approach in public service delivery. Additionally, the need for thorough research on PSILs was underscored.

The ambiguity surrounding the definition of co-creation and its subsequent interpretations by various stakeholders emerged as a significant barrier. The variances in interpretations led to inconsistencies in the implementation of co-creation, thus identifying and addressing a previously unexplored research gap. Furthermore, this research underscored the need for a common language, highlighted by Mahmoud et al., 2021, that could align

different stakeholders' perspectives and foster a collaborative environment conducive to co-creation.

This research has also illuminated the fact that varying interpretations of co-creation concepts by different actors within organizations could lead to ambiguity and misunderstanding. This underlined the importance of cultivating a common language for communicating objectives and concepts within organizations to foster alignment among stakeholders and mitigate misinterpretations.

Diverse interests, levels of knowledge, and power dynamics among stakeholders emerged as another significant barrier to the co-creation initiatives. To navigate these challenging dynamics and shape the initial conditions and outcomes of co-creation processes, a thorough understanding of these factors was deemed indispensable. The research emphasized the need for stakeholders to share a consistent perception of the objectives to ensure the smooth functioning of co-creation initiatives.

Moreover, this research further drew attention to the limited scholarly consideration of PSILs. Even though these labs were linked with co-creation, co-design, and co-production, there is a dearth of comprehensive research on their operation, impact, and the specific challenges they face. This research sought to contribute to the scholarly exploration of PSILs, underlining the pressing need for more focused academic attention on these labs.

7.1 Contributions

There are key contributions unique to this research that invite further research and investigation.

7.1.1 Contributions in the context of SCOT

Interpretative Flexibility of Co-creation:

The research has shown that co-creation in public sector innovation labs is subject to interpretative flexibility. Different leaders have different interpretations of co-creation, shaped by their unique experiences, contexts, and perceived barriers. This finding expands our understanding of the complex nature of co-creation and suggests that a one-size-fits-all approach may not be effective.

Influence of Interpretations on Implementation:

The research has identified a clear link between leaders' interpretations of co-creation and how they implement it. This finding underscores the importance of understanding and considering these interpretations when planning and executing co-creation initiatives.

Contextual Barriers:

The research has identified a range of barriers, both internal and external, that can impact leaders' interpretations and the implementation of co-creation. Understanding these barriers is crucial for developing strategies to overcome them and enhance co-creation.

Key Requirements and Resources: The research provides practical insights into the resources and support that leaders identify as necessary for successful co-creation. These insights can guide the development of resources and strategies to support co-creation in public sector innovation labs.

Application of SCOT:

Finally, the use of SCOT as a theoretical framework provides a novel perspective on co-creation in public sector innovation labs. It emphasizes the importance of considering the social and contextual factors that influence technological development and use. This application of SCOT could inspire further research into the socio-technical dynamics of co-creation. These contributions collectively enhance our understanding of co-creation in public sector innovation labs and offer valuable insights for both practitioners and researchers.

7.1.2 Contributions to Literature Gaps

This research contributes to the field by addressing several of the gaps identified in the literature. Specifically, it focuses on understanding the individuals working within Public Sector Innovation Labs (PSILs) and their perceptions and practices regarding co-creation.

Filling the Gap in PSIL Literature:

While previous research has predominantly studied PSILs as institutions (Litowtschenko and Berglund 2019), this research addresses the identified gap by shifting the focus to the individual leaders working within these labs. Using SCOT as the theoretical framework, it delves into their unique interpretations and implementation of co-creation. It offers insights into how these individuals navigate various barriers, such as risk aversion, bureaucracy, and resourcing challenges (Wellstead et al., 2021), thereby contributing to a more comprehensive understanding of PSILs from the perspective of those directly involved in their operation.

Filling the Gap in Co-creation Literature:

The field of co-creation, particularly within the public sector, has lacked comprehensive research endeavors focused on the practice's intricacies (Torfing et al., 2019). This research addresses this gap by exploring the self-organizing and emerging relationships within and between systems and their environments (Fox et al., 2019). It considers the diverse interests, levels of knowledge, and power dynamics among stakeholders (Ansell and Gash, 2007) that shape co-creation processes, shedding light on a facet of co-creation that has been underexplored in existing literature.

Direct Addressing of Future Research Suggestions:

This research directly follows the future research suggestions outlined in the literature review. By shifting the unit of analysis from the organization to the individual workers within PSILs (Wellstead et al., 2021) and exploring the potential of co-creation by examining self-organizing and emerging relationships within and between systems (Fox et al., 2019), this research brings new insights to the field.

This research's contributions are substantial and can spur further studies on individual interpretations, implementation of co-creation in PSILs, and how they overcome barriers. These findings can also inform policy and practice, assisting those involved in public sector innovation to enhance their co-creation initiatives.

7.1.3 Contributions to Literature

This research significantly contributes to addressing the identified gaps in literature around the topics of Public Sector Innovation Labs (PSILs) and co-creation. By focusing on the individual perspectives of leaders within PSILs, the research provides a fresh lens through which to understand the implementation of co-creation in these unique settings. Below are the key contributions this research makes to each gap identified in the literature:

Contribution to PSIL Literature

The existing literature largely focuses on PSILs as institutions, leaving a gap in understanding the individuals who work within these labs (Litowtschenko and Berglund 2019). This research fills this gap by bringing to the forefront the voices and perspectives of the leaders in these labs. The interviews conducted provide an in-depth look at their roles, challenges, strategies, and perceptions of co-creation.

By focusing on the individuals and their experiences, this research provides richer, more nuanced insights into the workings of PSILs. This granular focus on individual workers helps shed light on the unique pressures and constraints they face and the strategies they employ to overcome these challenges. The experiences of these individuals, as narrated through their own words, help to unravel the complexities of working in PSILs. This focus is a significant departure from prior studies, which have tended to view PSILs from an organizational or institutional lens (Wellstead et al., 2021).

Moreover, the research also highlights how these leaders navigate the barriers they encounter. It elucidates how they manage issues like risk-aversion, bureaucracy, and resource limitations – insights that could be valuable for others in similar roles or for policymakers interested in fostering innovation in the public sector. The lessons learned from their experiences could be used to develop better strategies, policies, or training programs to support these leaders in their roles.

Contribution to Co-creation Literature

Despite the growing interest in co-creation, the literature still lacks in-depth research on this practice in the public sector (Torfing et al., 2019). Our research addresses this gap by examining the interpretations of co-creation by leaders in PSILs and how these interpretations influence its implementation. The study reveals the multiple, complex ways in which co-creation is understood and enacted within these labs.

Through the lens of the SCOT framework, the research elucidates how the interpretation and implementation of co-creation are influenced by various factors like social dynamics, individual beliefs, and organizational constraints. It provides a more holistic understanding of co-creation, accounting for the messy realities and complex dynamics that come into play when trying to implement co-creation in a public sector setting.

Additionally, the research also looks at how these leaders navigate the challenges and barriers that arise in the implementation of co-creation. It provides insights into the strategies they use, the resources they leverage, and the ways they negotiate with and manage the interests and power dynamics among different stakeholders (Ansell and Gash, 2007). These insights provide valuable practical knowledge that can inform and improve the implementation of co-creation in public sector settings.

In conclusion, this research not only addresses several problems and gaps in the existing literature but also offers tangible, practical insights that can inform policy and practice. The focus on the experiences and perspectives of individual leaders within PSILs

provides a nuanced understanding of the challenges and strategies related to the implementation of co-creation in the public sector.

7.1.4 Contributions to Answering the Research Questions

- In answering the first research questions on how the interpretatations of leaders impact their implementation of co-creation:

The lense of interpretative flexibility lended by SCOT, shows that where there is high interpretative flexibility of co-creation (due to high diversity of interpretations) the implementation is also highly divergent and thus siloed to each leader's domain and is also less collaborative and communicative which defies the essence of co-creation.

Then, on the contrary, where there is low interpretative flexibility (due to homogeneity of interpretations) there is more understanding and maturity of certain aspects of co-creation. And that allows for more collaboration due to mutual understanding and a lower likelihood for conflicts - and that generally streamlines the process of co-creation and enables it to be executed efficiently.

Hence, it could be concluded for the first question that interpretations do influence the implementation of co-creation and that the areas where there is more agreement and homogenous interpretations of co-creation are the areas where co-creation is widely adopted and implemented by the majority.

- The second research question: The research further explored the perceived barriers in the wider context, that affect the interpretation and implementation co-creation which are summarized in Table 5.

The key barriers highlighted where those that obstruct the communication and information within the organization as pointed by the interviewees as the organization's scaling or team expansion. Which has led to diminishing the opportunities to engage and interact between teams and thus inhibiting the overall process of collaboration and knowledge sharing within the organization.

- The sub research question to the second question:

The responses and suggestion from the perspective of the leaders to overcome their perceived barriers to co-creation within the organization were relevant to the answer of the second research question and strengthen the overall analysis of the first research question. One example is the adoption of lean govefrnance structures that facilitate the

collaboration across teams. And another was agility which also achives a more efficient cross-team collaboration and communication.

It could be concluded from the responses of the five leaders that by advancing clear communication and collaboration (via agility and lean governance), the process of co-creation can overcome the barrier of hetergonous interpretations (high interpretative flexibility) which according to SCOT affects the maturization of a concept within an organization.

7.2 Future Research

The results of this research can catalyze further research in the field and support the development of more effective strategies and policies for fostering co-creation in the public sector innovation lab landscape. One possible area for future research has emerged from the following mixed opinions of leaders interviewed. One interviewee specifically identified the scalability associated with the growth of the teams and expansion of portfolio constitute a challenge to staying informed about the work of other teams - which was compared to the early days of the lab when only a handful used to work, and everyone shared a mutual knowledge and understanding of the ongoing work.

On the other hand, another interviewee views the scalability positively and stresses that the key strength of the organization is the sense of being one team and consistent communication about the ongoing work of each team - which was also compared to the early days of the lab but to convey that despite the expansion, the teams are still well informed and on the same page. Hence, for future research exploring scalability and whether it reconstructs and reiterates public sector silos in public sector innovation labs. Another area would be the size of the teams in innovation labs and how innovation team dynamics evolve and change as a result of the larger team members numbers.

Another possible area for future research that emerged from the findings of the interviews is the maturity of the organization. The current stage of maturity of the Exchange Lab, which ranges from 5-6 years, is at a point where it is faced by a lot of uncertainty determining future direction, reflecting on prior work, etc as reported by the leaders interviewed. Additionally, leaders within PSILs suggested several key resources required to improve the co-creation process. These included the necessity of a clear definition of co-creation, a shared language for internal communication, and a more nuanced understanding of the functioning of PSILs. These suggestions provide a roadmap for future areas of research in public sector innovation labs studies.

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Appendix

A Appendix 1

Bason (2018) summary of classifications of innovation roles.

Source: Bason (2018, P.300)

Courage	Consciousness	Capacity	Co-creation
THE VISIONARY [Politician]	Formulating a vision that demands innovation	Investing in innovation capacity	Expecting administrators to be professional innovators
THE ENABLER [Top executive]	Engaging managers in a dialogue about innovation	Crafting and implementing strategies for innovation	Extending a licence to innovate
360 DEGREE INNOVATOR [Mid-level manager]	Applying language of innovation to problem-solving	Creating innovation space	Embracing divergence
KNOWLEDGE ENGINEER [Institution head]	Empowering staff to reflect on own practices	Recruiting and developing a diversity of talent	Encouraging small-scale experimentation and learning

Declaration of Authorship

I hereby declare that, to the best of my knowledge and belief, this Master Thesis titled "All for One or One for All: Exploring the Interpretations of Co-Creation in Public Sector Innovation Labs" is my own work. I confirm that each significant contribution to and quotation in this thesis that originates from the work or works of others is indicated by proper use of citation and references.

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