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Design-Driven Policy Innovation and Subsystem Dynamics: the Case of the Digital Civilian Service

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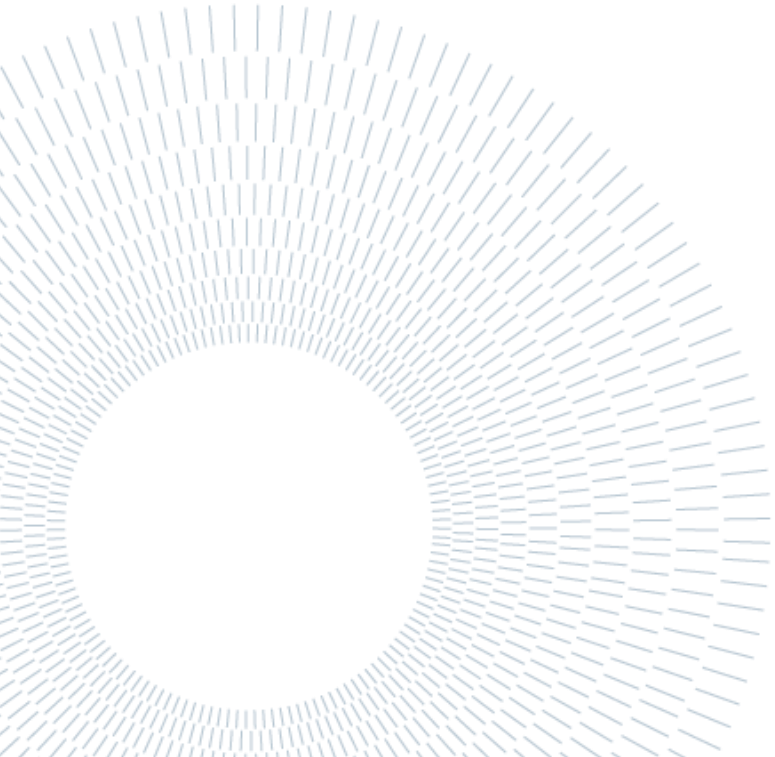


Abstract

The concept of innovation is both intricate and multifaceted. While most innovation definitions predominantly centre on business innovation, which entails the development of novel processes, products, or services to attain a competitive advantage, the significance of innovation in the realm of public policy is often underestimated. However, in our interconnected and ever-evolving global landscape, it is of utmost importance. Public policies must continually adapt and innovate to address pressing challenges such as climate change, public health, urbanization, and digital transformation. Hence, this thesis aims to explore the intricate dynamics of public policy innovation, using the Punctuated Equilibrium Theory (PET) (Baumgartner & Jones, 1991) as the reference framework. However, PET, despite providing a macro-level description of policy change process, has limitations in analysing the micro-level dynamics and the internal characteristics of subsystems, which can either facilitate or hinder innovation. To address these limitations, the applicability of Design-Driven innovation theory (Verganti, 2008), developed in the context of products and services innovation, to public policy is explored. This theory shares with PET the concept that a shift in meaning steers radical innovation. As a case study for the empirical analysis, the Digital Civilian Service (SCD), an Italian public policy aimed at reducing digital inequalities, is employed. The qualitative analysis based on the coding of 34 interviews conducted with the organisations engaged in SCD design and implementation, underscores the central role of subsystems in the policy innovation process. In particular, the findings highlight how the characteristics and dynamics of stakeholders within the subsystem, as well as the policymaker's design process, exert a significant influence on the radicality of the innovation. This empirical analysis leads to the development of a three-dimensional model that extends the Design-Driven innovation theory, offering a detailed overview of the various outcomes of Design-Driven radical innovation depending on the characteristics and dynamics of the subsystem's stakeholders. This new comprehensive framework complements PET, offering a higher level of detail, and enriches Verganti's theory (2008) adding the analysis of stakeholders' organisational dynamics to the dimensions of meaning and functionality.

Keywords: Public policy innovation, Policy change, Design-Driven innovation theory, Punctuated Equilibrium Theory, Subsystem, Stakeholders

Abstract in italiano

L'innovazione è un concetto complesso e sfaccettato. Mentre la maggior parte delle definizioni di innovazione si concentra prevalentemente sull'innovazione aziendale, che implica lo sviluppo di processi, prodotti o servizi innovativi per ottenere un vantaggio competitivo, l'importanza dell'innovazione nel campo delle politiche pubbliche è spesso sottovalutata. Tuttavia, in un contesto globale interconnesso e in costante evoluzione, essa assume un'importanza fondamentale. Le politiche pubbliche devono continuamente adattarsi e innovarsi per affrontare sfide urgenti come il cambiamento climatico, la salute pubblica, l'urbanizzazione e la trasformazione digitale. Pertanto, questa tesi esplora le dinamiche dell'innovazione delle politiche pubbliche, usando come riferimento la teoria del Punctuated Equilibrium (PET) (Baumgartner & Jones, 1991). Tuttavia, la PET, pur offrendo una descrizione di macro-livello del processo di cambiamento delle politiche, ha delle limitazioni nell'analizzare le dinamiche di micro-livello e le caratteristiche interne dei sottosistemi, che possono favorire o ostacolare l'innovazione. Per affrontare queste limitazioni, è stata esplorata l'applicabilità della teoria Design-Driven (Verganti, 2008), sviluppata nel contesto dei prodotti e dei servizi, alle politiche pubbliche. Questa teoria ha in comune con la PET il concetto che l'innovazione radicale è guidata da un cambiamento di significato. Come caso di studio per l'analisi empirica, è stato scelto il Servizio Civile Digitale (SCD), una politica pubblica italiana volta a ridurre le disuguaglianze digitali. L'analisi qualitativa basata sulla codifica di 34 interviste con le organizzazioni coinvolte nella progettazione e attuazione del SCD, evidenzia il ruolo centrale del sottosistema nel processo di innovazione delle politiche. In particolare, i risultati sottolineano come le caratteristiche e le dinamiche degli attori all'interno del sottosistema e il processo di formulazione della politica da parte del decisore politico, esercitino un'influenza significativa sulla radicalità dell'innovazione. Questa analisi porta allo sviluppo di un modello tridimensionale che estende la teoria Design-Driven, offrendo una panoramica degli esiti dell'innovazione radicale in base alle caratteristiche e dinamiche degli attori coinvolti. Questo modello integra la PET, introducendo un ulteriore livello di dettaglio, e arricchisce la teoria di Verganti (2008), aggiungendo l'analisi delle dinamiche organizzative alle dimensioni di significato e funzionalità.

Parole chiave: Innovazione delle politiche pubbliche, Cambiamento delle politiche, Teoria dell'innovazione Design-Driven, Teoria del Punctuated Equilibrium, Sottosistema, Portatori di interesse

Contents

1 Introduction

The concept of innovation is multifaceted and nuanced, characterized by a lack of universally accepted definition within the existing body of literature. This lack of consensus arises from the myriad of interpretations that often overlap, making it challenging to establish a singular, definitive description (Stenberg, 2017). Traditionally, most definitions and research on innovation have focused on the business domain. In this context, innovation primarily involves the creation and implementation of new processes, products, or services, with the aim of gaining a competitive advantage and enhancing operational efficiency (Baregheh et al., 2009).

While business innovation undoubtedly holds great significance, there is another equally relevant realm of innovation that often remains overlooked: public policy innovation. In our interconnected contemporary world, the ever-evolving nature of society requires public policies to be flexible and forward-looking. The challenges we are facing – from climate change to public health crises, from urbanization to digital transformations – demand that policymakers employ innovative strategies to create effective solutions (OECD, 2011).

Consequently, it is imperative to embark on a comprehensive exploration of the phenomenon of public policy innovation. Understanding these ongoing transformations not only has the potential to enhance stakeholders' adaptability but also facilitates more effective and efficient change management for policymakers (Prochaska & Schiller, 2021). This investigation seeks to uncover the circumstances that instigate policy innovation, discern the factors that influence it, and trace its intricate evolution.

Despite a wealth of existing literature on policy change and innovation, the prevailing theories are scattered across various academic streams, lacking a unified and all-encompassing framework. Notably, within this literature, prominent theories include the Multiple Stream Approach (Kingdon, 1995), the Advocacy Coalition Framework (Sabatier, 1988), and the Punctuated Equilibrium Theory (Baumgartner & Jones, 1991). The first two theories take a prescriptive approach, emphasizing agenda-setting and recommending actions for actors to initiate policy change. In contrast, Punctuated Equilibrium Theory (PET) offers a descriptive analysis of policy change evolution, emphasizing the interplay between stability and change.

Given its importance in the literature and its unique perspective on explaining policy change, this research project will adopt PET as the primary reference framework.

According to this theory, policy change is characterized by extended periods of policy stability punctuated by brief bursts of rapid change. These punctuations, which can be also defined as policy innovation or policy change, are typically triggered by external events, shifts in public opinion, or policy windows, creating opportunities for policymakers to advocate for significant changes.

Nonetheless, while PET has been influential in elucidating large-scale policy innovation at the macro level, it encounters inherent limitations when it comes to comprehending the micro-level dynamics within policy subsystems that influence change. These limitations have prompted inquiries into the existence of alternative innovation models that could offer a more comprehensive explanation of public policy innovation, either alternatively or complementarily to PET.

To delve into this question, I have undertaken an extensive literature review on innovation models from various fields. Within this exploration, the literature on innovation in products and services, especially Verganti's (2008) Design-Driven innovation theory, emerged as a promising avenue for enhancing comprehension of policy change due to its points of contact with PET and its relevance within the existing literature.

In order to empirically assess the applicability and utility of Design-Driven theory in the realm of policy innovation, I have examined the case of the Digital Civilian Service (SCD) in Italy. The SCD is a pivotal initiative aligned with the objectives of the National Strategy for Digital Competences, designed by the Digital Transformation Department (DTD), and implemented in collaboration with the Department for Youth Policies (DYP). This policy seeks to reduce digital inequalities by enhancing the digital capabilities and skills of citizens, promote the use of digital public services to ensure the full realization of citizenship rights, and facilitate collaboration between the public administration, organisations, and citizens. Approximately 9,700 volunteers will be recruited as "eFacilitators" between 2021 and 2025, assisting marginalized individuals facing technology challenges and limited digital proficiency.

Moreover, the SCD projects are organized into two primary categories of intervention: digital facilitation, which involves providing support for the utilization of digital devices and online services, and digital education, which focuses on actively promoting digital culture and enhancing the citizens' fundamental and advanced digital skills through targeted educational activities.

The selection of this case study was influenced by two key factors, which will be discussed further in subsequent chapters. Firstly, the SCD represents a well-defined and observable subsystem, making it simpler to analyse. Secondly, it belongs to the category of social policies, which, in opposition to the ones examined by PET, place greater importance on human capital than on physical assets. Consequently, unlike the findings of Baumgartner & Jones (1991), the emergence of punctuation in such public policies does not typically result in a significant increase in budget allocations.

Despite the radical policy innovations envisioned and designed by the policymakers, the resulting impact of SCD has not led to a radical change, primarily due to the different approaches adopted by stakeholders. While some stakeholders have embraced innovation, undergoing radical transformations to align with the profound changes required by the policy, others have maintained traditional practices, persisting in their established practices. An in-depth analysis of the factors and dynamics among stakeholders, contributing to diverse implementation outcomes and mitigating the level of radical change, has extended Design-Driven theory and enriched PET.

In summary, this thesis has three primary objectives. Firstly, to apply Design-Driven theory to expand upon the insights offered by Baumgartner & Jones' (1991) policy change theory. Secondly, to assess the need for modifications to make Verganti's (2008) theory applicable to explain policy innovation. Finally, to determine whether the model resulting from the adaptation of Design-Driven theory into the realm of public policy innovation complements or offers an alternative perspective to PET. Furthermore, this work will provide valuable implications for policymakers, aiding them in achieving radical policy innovation, and providing guidance for managers in nurturing an organisational culture that fosters innovation and embraces change.

To accomplish the research objectives, this thesis is structured as follows:

- Chapter 2 provides a thorough analysis of the literature on the subject, describing the methodology used to conduct it.
- Chapter 3 elucidates the knowledge gaps in the current literature and formalizes the research questions.
- Chapter 4 describes the methodology used to conduct my empirical analysis.
- Chapter 5 presents the empirical findings and the propositions I formulate to answer my research questions.
- Chapter 6 examines the implications of this study for academics, policymakers, and practitioners.
- Chapter 7 presents the thesis's conclusions, discusses its limitations, and proposes a research agenda for future research.

2 Literature Review

This chapter explores the existing literature on three main topics: public policy innovation, product and service innovation, and digital inequalities.

The initial section of this chapter encompasses a detailed description of the methodology employed for the literature review. Following that, the second section examines innovation in public policy through the lens of Baumgartner & Jones' (1991) Punctuated Equilibrium Theory (PET). The analysis highlights this theory's limitations, prompting the question: "*Are there any theories of innovation that can help explain policy change either alternatively or complementarily to PET?*"

To address this question, the third section of this chapter delves into the literature on innovation in the context of products and service, finding a promising candidate in Verganti's (2008) Design-Driven innovation theory. This theory will be thoroughly examined, with a clear explanation of the reasons for its selection.

In the concluding section of this chapter, an in-depth literature review of policies designed to tackle the second-level digital divide is presented. This analysis contributes to a more profound understanding of the empirical context of this research.

2.1. Methodology of the literature review

The sources for the literature review were gathered following the PRISMA protocol (Liberati et al., 2009) and adopting a mixed approach consisting of three main steps:

1. Initially, given the central emphasis of this thesis on policy change and innovation, a deliberate choice was made to employ a snowball approach starting from Baumgartner & Jones' seminal paper "*Agenda Dynamics and Policy Subsystem*" (1991). This approach facilitated the comprehensive identification of all pertinent papers related to this topic. The choice of this work as a starting point is also motivated by the following parameters[1], underscoring its significance in the existing body of literature:
    - Number of citations: 216 (Google Scholar); 949 (Semantic Scholar)

[1] The records extraction was performed in January 2023 (10/01/2023).

- Highly Influential Citations[2] (Semantic Scholar): 57

2. Second, a non-structured search approach was employed to extend the exploration beyond the boundaries of policy studies and investigate innovation models applied in various scientific fields. This phase involved extensive searches on Scopus and Google Scholar, utilizing keywords such as "Model", "Framework", "Innovation", "Radical", and "Incremental". After a comprehensive examination of various innovation-related theories, Verganti's (2008) Design-Driven innovation theory emerged as a promising candidate, owing to its significance in the literature and its points of convergence with PET. Specifically, the seminal paper that served as reference point and that was further explored using a snowball approach to identify other relevant articles was Roberto Verganti's (2008) paper: *"Design, Meanings, and Radical Innovation: A Metamodel and a Research Agenda*"*. This work holds considerable relevance within the literature, as demonstrated by the following parameters:
    - Number of citations: 1,242 (Google Scholar); 477 (Scopus); 739 (Semantic Scholar)
    - Field-Weighted Citation Impact[3] (Scopus): 8.36
    - Highly Influential Citations (Semantic Scholar): 84

    Furthermore, the exploration of literature pertaining to innovation model, enabled the identification of additional papers focusing on the factors that positively influence change and innovation within organisations These papers played a crucial role in shaping the application of Verganti's (2008) theory to enhance the comprehension of policy innovation process.
3. Finally, extensive research was conducted to comprehensively explore policies and initiatives similar to the one under analysis – the Digital Civilian Service (SCD) –, whose goal was to reduce digital inequalities. Specifically, I used the Scopus database from January to September 2023 and developed a targeted query to gather relevant papers (Section 2.4). The query developed for this step of the literature review will be explained in detail in the following paragraphs.

2.1.1. Search terms

For the third step of the literature review, a query was designed to identify literature relevant to the domain under analysis, specifically initiatives, programs, and policies

[2] Semantic Scholar (SS) is an artificial intelligence-based database that allegedly identifies influential citations defined as "Highly Influential Citations (HICs)". Citations are considered highly influential according to SS when the cited publication has a significant impact on the citing publication.

[3] Field-Weighted Citation Impact shows how well cited this document is when compared to similar documents. A value greater than 1.00 means the document is more cited than expected according to the average.

aimed at reducing the digital divide, with a focus on providing competences, skills, and knowledge. The resulting query is:

*("divide" OR "*clusion" OR "inequalit*" OR "disparit*" OR facilitation)*

AND

(competenc OR skill* OR knowledge OR *literac*)*

AND

(polic OR program* OR initiative* OR project* OR "case stud*" OR "model*")*

AND

(digital OR internet OR ict OR computer OR "information and communication technolog")*

The initial part of the query incorporates terms such as "divide" and "inclusion" to identify the entire body of literature that examines the gap between individuals who can effectively access digital technologies and those who cannot. Indeed, according to DiMaggio & Hargittai (2001), the digital divide can be defined: "*inequality between 'haves' and 'have-nots' differentiated by dichotomous measures of access to or use of the new technologies*" (p. 2). This part of the query also includes terms like "inequality" and "disparity" to uncover more recent literature concerning digital inequalities. This term distinguishes itself from the traditional digital divide concept, emphasizing the idea of a wide and continuous spectrum of digital inequalities, linked to tangible offline outcomes (Livingstone & Helsper, 2007). This novel concept not only addresses differences in access but also encompasses disparities among individuals who have formal Internet access. Under this definition, digital inequalities encompass variances in knowledge and proficiency in using digital and information technology, shaped by diverse demographics, socioeconomic backgrounds, levels of experience and competence in information technology.

The second part of the query centred on digital competences and incorporated synonyms commonly used in the literature, such as skills, knowledge, attitudes, and literacy, even though they may have nuanced differences in meaning. This approach was adopted to ensure that the literature under scrutiny predominantly covers initiatives targeting the second-level digital divide, with a specific emphasis on enhancing digital skills for individuals lacking proficiency in this domain.

The third part encompassed all the key terms used in the literature to describe policy and intervention.

An additional criterion was added to the query to narrow the scope of the research and the number of papers that were identified. To be more precise, since the first

publicly accessible website was published in 1991, only papers published after that date were considered.

AND

PUBYEAR > 1990

Finally, the last part is introduced to exclude papers that include policies specifically aimed at businesses or particular industries.

AND NOT

("machine learning" OR psycholog OR sensor* OR mechanic* OR trade OR e-commerce OR marketing OR game* OR physic* OR math* OR agricultur*)*

Further restrictions are applied to filter out irrelevant results:

1. Articles must be in English.
2. Publication stage must be "final".
3. Source type must be "journal" and document type must be "article".

The following subject areas were excluded, as they are not inherent to the topic: medicine, arts, psychology, environment, nursing, energy, agriculture, physics, and astronomy, biochemical, mathematics, neuroscience, chemistry, earth and planetary sciences, pharmacology, toxicology and pharmaceutics, dentistry, immunology and microbiology, veterinary, and chemical engineering.

2.1.2. Inclusion and exclusion criteria

The focus on public policy necessitates the addition of specific inclusion and exclusion criteria:

1. Papers must address public policies promoted by governments or other public institutions.
2. Regardless of the type of intervention implemented, policy objectives should include the development of digital competences.
3. Sectoral policies, which are defined as long- and/or medium-term frameworks adopted by a government as a plan of action for a specific area of the economy or society (OECD, 2006), such as health, education, and labour, are excluded. For example, programs focusing on young people that are primarily conducted within the school environment and fall under the category of education policy are considered out of scope.

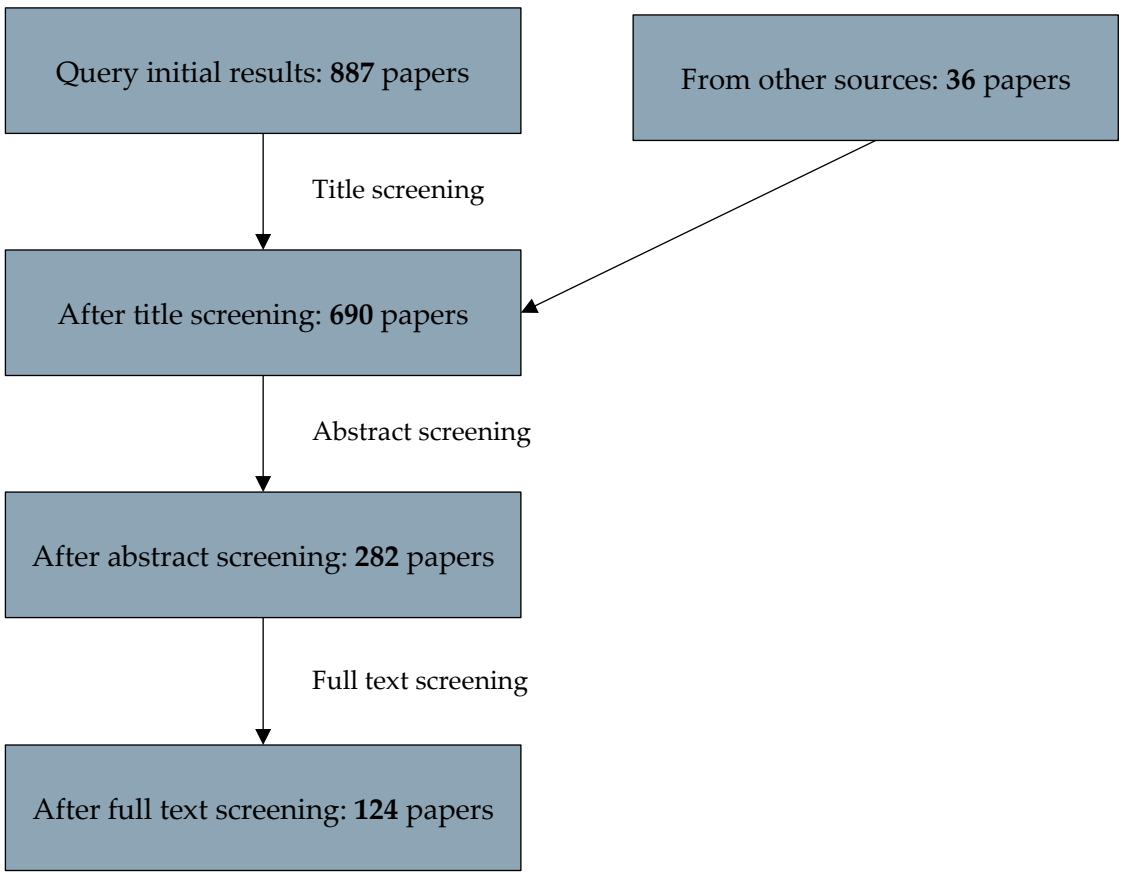
2.1.3. Study selection

Through the query illustrated in Section 2.1.1, 887 results were found. Additionally, 36 papers from other sources, were included. These papers encompass those identified

during the initial and second phases of the literature review methodology as detailed in Section 2.1, as well as additional articles related to the second-level digital divide, discovered through a snowball approach stemming from the papers identified in the third phase of the literature review.

After the title screening, 690 papers remained. With the abstract screening, other papers were excluded, leading to 282 articles. A comprehensive full-text screening was then conducted to exclude articles that solely addressed the first-level digital divide issues, such as broadband availability, infrastructure, device provisions, or training to enhance broadband adoption without referencing digital competence as a policy objective. Articles focusing on sectoral policies, like the enhancement of ICT skills in schools via device provisions or obligatory ICT courses, were also excluded. This led to a final count of 124 papers for the literature review. Figure 2.1 illustrates the process.

Figure 2.1: PRISMA model



2.2. State of the Art: Public Policy Innovation

In order to embark in the analysis of public policy innovation, it is imperative to establish a precise definition of what public policy means within the context of this work. Specifically, this thesis adopts the definition proposed by Tsoukiàs et al. (2013).

According to the authors, a public policy is characterised by:

1. *Use of public resources.* Policies are defined as irreversible allocations of resources, the majority of which, whether tangible or intangible, are provided by the government or other public institutions to predefined beneficiaries.
2. *Multiple stakeholders*. Given the participatory nature of the policy cycle, policies take into account the concerns, objectives, and expectations of multiple stakeholders, such as citizens, groups, or organisations.
3. *Long-time horizon*. Policies, whether they are strategic or not, often have a significant and extended policy cycle. This cycle includes stages such as problem identification, formulation, decision-making, implementation, and evaluation. Because of this, the outcomes and effects of a policy may not become apparent until a considerable amount of time has passed, leading to a degree of uncertainty regarding the policy's impact.
4. *Legitimation and accountability.* A policy cycle necessitates the legitimation of both the process and the policymakers, involving aspects like their actions, rationality, and decision-making. Legitimation can be achieved through legal mechanisms, knowledge dissemination, established practices, adherence to standards, and ethical considerations. Active engagement of stakeholders is crucial. Transparency, which includes explaining the rationale and results, and practitioner accountability, further contribute to this process.
5. *Deliberation*. Policy cycles, which often involve public decisions, require deliberation moments when decisions become official, disclosed to the public, legally enforceable, and resource distribution becomes irrevocable. These deliberation points are crucial in shaping the policy cycle's timeline.

Moreover, throughout the course of history, public policies have exhibited a remarkable capacity for evolution and adaptation. This phenomenon has given rise to a multitude of theories aimed at comprehending and elucidating these processes of change. The origins of research in this field can be traced back to the late 1950s, and in the contemporary academic landscape, policy innovation remains a subject of profound inquiry. Scholars continue to engage in the pursuit of new models that can either explain or extend existing theories (Schaffrin, 2013).

This thesis, in particular, focuses on examining the influence of stakeholders, which constitutes the second critical aspect of the previous definition, in the policy innovation process. Specifically, I adopt Freeman's (1984) definition of stakeholders,

characterizing them as "*any group or individual who can affect or is affected by the achievement of the organisation's objectives*"(p. 46). This definition is transposed into the realm of policymaking, as per the formulation by Helbig et al. (2015), which defines stakeholders as "*those who can affect or may be affected by a policy*" (p. 181).

In the following paragraphs, the concepts of public policy change and innovation will be defined, drawing upon Baumgartner & Jones' (1991) Punctuated Equilibrium Theory (PET) as the reference framework.

2.2.1. Definition of policy change and innovation

Change is a foundational concept in numerous scientific disciplines, drawing significant scholarly interest. It can be described as the transition wherein an entity demonstrates observable alterations in its inherent characteristics from one point in time (t) to another (t_1). These alterations might manifest in the entity's form, condition, or quality (Capano, 2009).

Within the realm of public policy, the dynamics of policy change and the intricacies of its underlying processes have garnered increasing attention (Cerna, 2014). Despite this heightened focus, a consensus remains elusive regarding a universal definition for policy change and the optimal theoretical models to elucidate its complexities (Šinko, 2016). Broadly speaking, policy change refers to the transition wherein existing policies undergo modification, replacement, or cessation, paving the way for the introduction or enhancement of new policy measures (Stewart et al., 1996).

Given its multifaced nature, it is critical to clearly define the object of change. This object can take various forms, such as a policy process or a component of it, or the policy's content, which can include meaning, strategies, and instruments. Along with identifying the object of analysis, the degree of change must also be assessed (Capano, 2009).

According to Capano (2009), the degree of change can be categorized into two types: incremental and radical. However, defining the precise meanings of these two forms of change is not a straightforward task. In general, it can be said that change is incremental when it represents a marginal deviation from the status quo, while radical when there is a profound departure from the existing situation. Nevertheless, this general understanding of the difference between the two must be contextualized, considering several other factors (Capano, 2009).

Furthermore, policy change is inextricably linked to policy innovation. According to Šinko (2016), the term innovation is commonly used in policy analysis, despite its origins in business management. It differs from invention, which denotes something completely new when it is first introduced. In the context of policies, innovations include modifications that improve or optimize policy measures. These changes are typically made within the framework of existing policies rather than the creation of entirely new ones. Consequently, policy innovation can be viewed as a controlled

process of change ranging from maintaining the status quo to implementing significant changes (Šinko, 2016).

Hence, policy change constitutes a comprehensive term encompassing both radical and incremental modifications to policies, whereas policy innovation specifically denotes change directed at introducing novel ideas, innovative methodologies, or practices into the formulation or implementation of public policies. The process of policy changes generates opportunities for innovation. Shifts in social, economic, environmental, or political contexts may necessitate adjustments or revisions to existing policies, thereby creating fertile ground for the emergence of novel ideas and innovative approaches.

Throughout history, numerous theories have been developed to explain the evolution of policy. John's (2003) exploration of policy change theories considers only those approaches that comprehensively account for most components that are inherent to policy change and development. Following the same logic, the most relevant theoretical frameworks include:

- *Multiple Stream Approach (MSA):* this framework aids in comprehending the convergence of problems, policies, and politics that together create favourable conditions for policy change (Kingdon, 1995).
- *Advocacy Coalition Framework (ACF):* it places its focus on the interactions among advocacy coalitions, which are groups of actors sharing common policy beliefs working to influence decisions. The framework emphasizes learning and negotiation among coalitions, driving policy shifts over time. (Sabatier, 1988).
- *Punctuated Equilibrium Theory (PET):* it seeks to elucidate the phenomenon where political processes typically exhibit stability and incrementalism, but occasionally undergo rapid and substantial changes (Baumgartner and Jones, 1991).

While the first two theories exhibit a more prescriptive nature, focusing on agenda setting and outlining the actions that actors should undertake to instigate policy change, PET provides a descriptive analysis of policy change dynamics, emphasizing the interplay between stability and change. Moreover, PET is more comprehensive, as it incorporates some key elements of the other two theories.

Due to its significant standing in the literature and its distinct and comprehensive perspective on the explanation of policy change, PET was chosen as the reference theory for this thesis.

2.2.2. Punctuated Equilibrium Theory (PET)

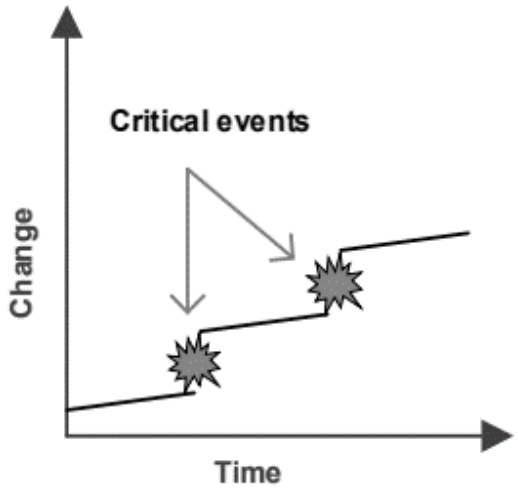
Baumgartner & Jones' (1991) Punctuated Equilibrium Theory takes its name from a pre-existing theory of modern palaeontology (Gould & Eldredge, 1977). This theory effectively challenged the long-standing assumption of incremental species evolution

that had prevailed in scientific understanding of biological evolution since the era of Darwin. Similarly, Baumgartner and Jones (1991) developed a model that contradicts conventional notion that policies evolve gradually. Instead, they propose that "*policies go through long periods of stability and short periods of dramatic reversal*" (p. 1044). These sudden and dramatic change are called "punctuations" (Figure 2.2). Essentially, this theoretical framework seeks to reconcile the extended equilibrium periods outlined by the incrementalist model with the sudden and transformative changes inherent in political systems.

The researchers illustrate these dynamics by scrutinizing various public policies, encompassing those pertaining to nuclear energy, tobacco, pesticides, and urban planning. For instance, tobacco policies exhibited minimal change until 1965, but in the late 1960s and early 1970s, a radical shift occurred in response to specific stakeholders' actions, notably the publication of the now-famous report "Smoking and Health".

At the core of PET lies the pivotal assertion that "*a single process can explain both periods of extreme stability and short bursts of rapid change. This process is the interaction of beliefs and values concerning a particular policy, which we term the policy image, with the existing set of political institutions – the venues of policy action"* (Baumgartner & Jones, 1991, p. 1044). The subsequent paragraphs will provide a more in-depth exploration and elucidation of these concepts.

Figure 2.2: Graphic representation of Punctuated Equilibrium Theory



2.2.3. Pluralism and political subsystem

The PET is rooted in the framework of pluralism, which has been a dominant paradigm in American political science for nearly a century. One key characteristic frequently observed and acknowledged by political scientists within pluralist governance is the capacity of singular economic interests within specific industries to

shield themselves from the influence of broader democratic forces by establishing relatively autonomous and depoliticized subsystems (Jolicoeur, 2018). These subsystems are made up of a small number of concerned actors, who are typically experts from government, industry, and civil society and they are generally highly resistant to change (Baumgartner & Jones, 1991).

Specifically, the policy subsystems concept was first introduced by Griffith (1939), highlighting that specific policy issues brought together individuals from various government branches and interest groups who shared common concerns about an issue. Subsequently, Maas (1951) observed that subsystems often functioned in isolation from external actors and found that decision-making pertaining to the policy area was highly centralized within the subsystem. This notion of subsystems existing as self-contained and autonomous entities laid the foundation for the concept of the "iron triangle". The iron triangle is used to describe a close and often mutually beneficial relationship between three key actors in the policy-making process: legislators, bureaucrats, and interest groups. These three entities form a triangular relationship where they work together to advance their respective interests.

In the course of scholarly debates regarding the openness of subsystems, it became apparent that the concept of the iron triangle alone might be inadequate and incomplete (McGee & Jones, 2019; Heclo, 1978). To address this limitation, he introduced the idea of issue networks, which can be concisely defined as loosely connected groups of actors, all sharing concerns about the same issue. Significantly, these networks exhibit greater openness and inclusivity compared to iron triangles.

Current theories of the policy process rely extensively on the notion of subsystems as the primary unit of analysis. In particular, PET was the first theory to synthesize earlier advances in agenda-setting studies with the traditional concept of subsystems. According to Baumgartner & Jones (1993), policy subsystems represent specific issue areas or domains within the political system, including healthcare, education, environmental regulation, or immigration, characterized by unique stakeholders, interest groups, government agencies, and experts shaping policies in those domains.

The existence of numerous subsystems, each driven by a distinct set of interests, presents policymakers with a plethora of problems contending for their attention. However, policymakers cannot afford to deal with every issue at once. Consequently, they frequently give priority to a small number of issues while pushing the majority to the end of the policy agenda. This phenomenon, whereby decision makers are limited by their cognitive and informational abilities when making decisions, is called bounded rationality (True et al., 2006) and helps explain why many policies remain unchanged for a long time. Barabási (2005) also addresses this issue by referring to it as the process of "queuing" or making decisions one at a time. Most decisions can be made quickly, while others take longer. When there are many decisions to be made, some are simply pushed to the back of the line, sometimes for an extended period.

2.2.4. Policy image and policy venue

Baumgartner & Jones explain policy change through to the interaction between two key concepts: policy *image* and policy *venue*.

2.2.4.1. Policy image

Policy image refers to how public policies are depicted and debated in the public domain and media; it is constructed through the interplay of beliefs and values associated with a specific policy (Baumgartner & Jones, 1991). This image can be either positive or negative. A positive image typically leads to incremental policy changes, while a negative image can trigger a punctuation in the policy process.

During a period of stability, the subsystem emphasizes facts that strengthen and support its desired image, while concurrently downplaying or disregarding information inconsistent with it or supporting an alternative perspective. This process reinforces the positive image, thereby preserving the subsystem's monopoly. However, the accumulation of unresolved negative facts can put the subsystem at risk of punctuation.

Indeed, the occurrence of a significant event or a strategic stakeholder's intervention (often a combination of both) can draw attention from the media and the public to a new fact. This added information might be interpreted negatively and cast doubt on the policy image that the policy monopolies were attempting to maintain. Therefore, due to a change in the policy image, the probability of a radical policy change rises. According to Baumgartner & Jones (1991), such radical change is more often the result of a change in a policy's perception than of a real material change (Jolicoeur, 2018).

2.2.4.2. Policy venue

Policy venues are defined by Baumgartner & Jones (1993) as "*the institutional locations where authoritative decisions are made concerning a given issue*" (p. 32) such as government departments, congressional committees, and the courts.

According to Baumgartner & Jones (1991) our societies offer a multitude of policy venues. Some of them hold decision-making powers, while others serve as public forums and catalysts for altering the image of a policy. In the latter scenario, a strategic actor might leverage a new policy venue as a source of potential allies. Moreover, each institutional setting carries its own inherent bias in decision-making, given the variation in participants, values, concerns, and decision-making processes. When a question or an issue starts to be discussed or addressed in a new policy venue, those who previously controlled the policy process may find themselves in the minority. In essence, presenting their stance on an issue in new policy venues, seeking a more receptive audience, is the primary strategy employed by dissatisfied groups to trigger a policy punctuation (Jolicoeur, 2018).

Furthermore, there is a strategy known as "venue shopping" that can be used when a significant issue is not receiving the attention it merits from the authoritative institution. According to Baumgartner & Jones (1991), this approach is based on the notion of actively looking for a different institutional setting that might be more receptive to the issue at hand. It is important during the venue-shopping process to understand the specific context and decision-making procedures within each potential policy venue. Equally significant is the identification of which policy image a given policy venue is inclined to associate with or align with (Jolicoeur, 2018).

Therefore, policy venues play a crucial role in determining the trajectory of policy change, and it is crucial even for policymakers to attempt to predict how their ideas will be received in a specific institutional venue in advance (Baumgartner & Jones, 1991).

2.2.4.3. Interactions between policy images and venues

Both periods of stability and rapid change, according to Baumgartner & Jones (1991), are caused by the same process, which is explained by the interactions between policy image and venue: "*image and venue can combine to produce rapid change, or they may interact to reinforce the current assignment of authority*" (p. 1049).

A policy subsystem that has a dominant influence over policymaking in a particular issue area, can maintain its monopoly by controlling the policy image and policy venues. As long as the policy venue remains unchallenged a change in the image is unlikely. Similarly, the positive image of the policy protects the subsystem and does not involve new policy venues. This process of mutual reinforcement between policy image and policy venue is called negative feedback and promotes subsystem stability.

Instead, there is a higher probability of punctuation when due to critical events (such as economic crises, pandemics, or natural disasters) or strategic actions the image of an existing policy is weakened and an alternative image is strengthened, attracting the attention of other policy venues. Presenting an issue in new policy venues in an effort to find a more favourable audience is the main mechanism of action used by discontented groups to provoke a policy punctuation. This process is called positive feedback and can cause radical policy changes, that lead to the destruction of the current subsystem monopoly (Jolicoeur, 2018).

2.2.5. Punctuations and governmental budget variations

Baumgartner & Jones (2006) conducted an extensive numerical analysis of public budget changes to validate PET. Their primary goal was to demonstrate that public budgets occasionally deviate significantly from incremental variations, referred to as punctuations.

They focused on post-war US public expenditure, analysing annual percentage changes in areas like healthcare, social security, and education. According to the two

scholars, if the general nature of budget changes had been incremental (rather than punctuated), data should have a normal distribution. However, contrary to expectations of a normal distribution, the data exhibited a leptokurtic distribution, which can be distinguish by two main traits. First, it has a higher central peak and lower dispersion levels than expected. Indeed, in most cases, actual annual spending changes are minimal, with only minor incremental adjustments. Second, there are far more outliers than would be expected in a normal distribution. As a result, budget variations are characterized by many small changes combined with few large changes in each policy category (True et al, 2006).

These findings strongly supported the general punctuation hypothesis, affirming its fundamental role in the American political system. The deviation from normal distribution was not exclusive to budget data but also observed in other areas like US elections and congressional legislation.

2.2.6. Strengths and limitations of PET

PET has found application in a variety of policy contexts and has received considerable attention in the field of public policy. However, a thorough examination of its inherent strengths and limitations is required, as they form the foundation of this thesis' scope and objectives.

PET may be acknowledged for having made important contributions to the study of policy change, especially for three main reasons:

- Unlike traditional models that assume incremental policy change, PET recognizes the existence of period of *rapid and radical change* caused by a shift in policy image and a favourable policy venue.
- PET emphasizes the importance of a *subsystem's role* in shaping policy change since they contribute to stability during periods of equilibrium, acting as stabilizing forces. Simultaneously, they facilitate policy change during disruptions by serving as channels for the introduction and consideration of new information and alternatives.
- PET highlights the pivotal role of *policy image* in influencing policy change. When the image of a policy remains consistent, disgruntled actors are less likely to disrupt a subsystem, instead when it is altered the probability of a radical policy change rises.

Along with its strengths, the literature has identified some limitations:

- PET examines policy changes from a *macro level perspective*, and it is more interested in identifying significant shifts in policies rather than in comprehending the full complexity of policy change dynamics at micro-level. It also tends to overemphasize the role of external events in causing policy change, potentially overlooking the importance of internal factors and

dynamics within policy subsystems (Cairney, 2012). Specifically, there is a notable absence of analysis concerning the role played by interest groups and other stakeholders within these subsystems in influencing the process of policy change.

- While PET claims that punctuations correspond with significant shifts in governmental budget allocation, it is important to note that the relationship between punctuation and budget fluctuations is not consistent across all policy domains and contexts. This suggests that contrary to the model's prediction, radical changes are not always associated with significant budget modification.
- Several authors have questioned the *universality of PET* (Givel, 2006, 2012; Howlett, 1997). The American system is described as a unique example of pluralism: a federation of 50 independent states, a militant judiciary, powerful and competent interest groups, true separation of the executive and legislative branches, and a congress organized into congressional committees. All these characteristics combine to favour a punctuation dynamic by providing dissatisfied groups with numerous appeal mechanisms, but these are not present in all political systems (Jolicoeur, 2018).

2.3. State of the Art: Product and Service Innovation

The literature review on policy innovation revealed the limitations of PET. Consequently, a literature review concerning innovation in various domains was conducted to identify potential insights, theories, and conceptual frameworks that could be used in the development of a new model better suited to understand and explain innovation processes within the context of public policies.

The reasons guiding the analysis of innovation models in other fields were primarily twofold: firstly, the absence of an innovation model within the literature on public policies capable of addressing the limitations of PET, and secondly, the potential advantages of using models from other disciplinary fields to broaden perspectives and promote the exchange of knowledge and approaches across diverse disciplines.

The analysis of the innovation literature has resulted in the recognition of Verganti's Design-Driven theory (2008) as a promising candidate for several compelling reasons. Firstly, it holds substantial relevance within the existing literature (Section 2.1). Moreover, Verganti's (2008) theory provides a comprehensive framework that not only enables the integration and explanation of other innovation strategies, such as technology-push and user-centred innovation, but also takes a step further by introducing the novel concept of innovation guided by changes in meaning.

Furthermore, the third aspect influencing this choice is the presence of some points of convergence between PET and Design-Driven innovation theory:

- Both theories centre around the concept of shared meaning (called policy image in PET) within a system and how profoundly altering it can lead to radical innovations.
- Both acknowledge the existence of radical and incremental changes.
- Both recognize the importance of analysing the underlying dynamics of incremental and radical change. However, while PET acknowledges the significance of this analysis but maintains a high-level perspective, Desing-Driven innovation theory provides a more detailed and micro-level explanation of the drivers and dynamics influencing change in meaning. Indeed, Verganti's primary unit of analysis is the entrepreneur (or the firm), which represents a microeconomic unit, whereas for the PET, the focus is on the political system or the public sector, constituting a macroeconomic aggregate.

In summary, this section begins with a broad definition of innovation, distinguishing between radical and incremental forms. It then discusses the limitations of Human Centred Design (HCD) theory in explaining radical innovation. Subsequently, the Design-Driven innovation theory is introduced and detailed. Finally, Verganti's (2008) comprehensive theoretical framework describing various innovation strategies, along with the Metamodel for developing radical innovation of meaning, is presented. The section concluded by discussing key elements that promote innovation and change within organisations.

2.3.1. Definition of innovation

The concept of innovation is intricate and multifaceted, lacking a single universally accepted definition (Kogabayev & Maziliauskas, 2017). In an effort to establish a comprehensive understanding, Baregheh et al. (2009) conducted a thorough analysis of 60 diverse definitions of innovation sourced from a wide range of disciplinary literature. Their objective was to identify the core attributes associated with innovation and the terminology employed to delineate these attributes within each discipline. The outcome of their analysis is represented in Figure 2.3, providing a diagrammatic definition of innovation.

Drawing from this analysis, Baregheh et al. (2009) have defined innovation as "*the multi-stage process whereby organisations transform ideas into new/improved products, service or processes, in order to advance, compete and differentiate themselves successfully in their marketplace*" (p. 1334).

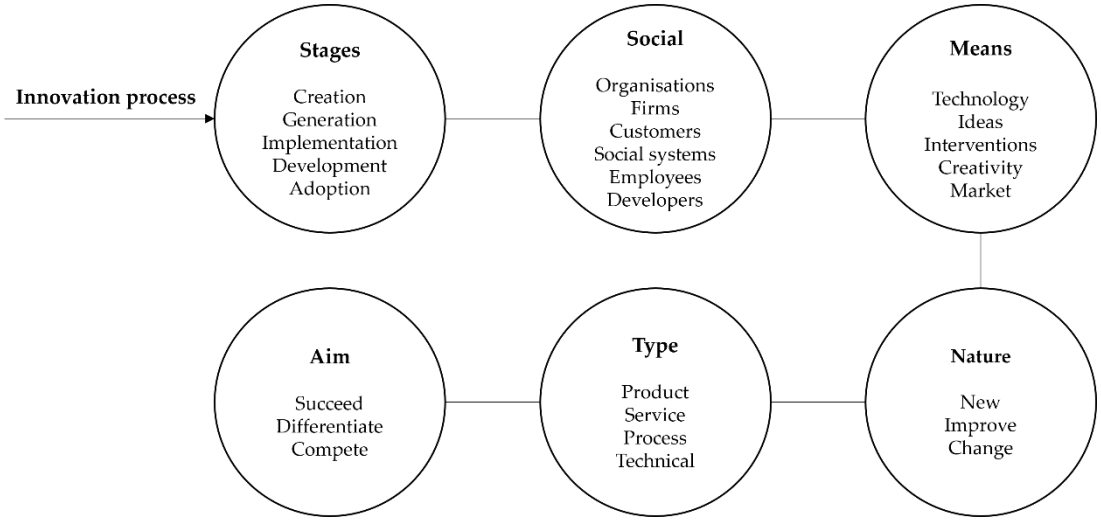
This definition highlights several key aspects:

1. It emphasizes that innovation is a multistage process, occurring over time, rather than a discrete event.
2. It acknowledges that while the primary focus is on innovation within business organisations, the concept extends beyond these boundaries, recognizing that

innovation can manifest in a wide array of social entities and within different contextual frameworks.

3. It underscores the means of innovation, referring to how ideas are transformed into novel, enhanced, or altered entities, whether they are products or services.
4. It articulates the goals of innovation, including "successfully advancing" (pertaining to process innovations) and "competing and differentiating". The inclusive language used in the statement highlights the broad strategic goal of innovation and acknowledges its flexibility to be applicable in various social and environmental contexts where innovation takes place.

Figure 2.3: Diagrammatic definition of innovation (Baregheh et al., 2009)



The definition of innovation presented in this paragraph forms the foundational understanding upon which this chapter is constructed. In the following sections, the intricate processes explaining the generation of innovation in products and services will be explored. The focus will be on a theory that has brought about significant changes and expanded traditional theories of innovation: Verganti's (2008) Design-Driven innovation theory.

2.3.2. Radical and incremental innovation

Before delving into the specifics of the Design-Driven innovation theory, a fundamental distinction between radical and incremental innovation must be made. The definition adopted in this research project is that of Norman & Verganti (2014), who outlined the two concepts as follows:

- *Incremental innovation*: it entails making improvements within an existing framework of solutions, essentially "*doing better what we already do*" (Norman & Verganti, 2014, p. 82).

- *Radical innovation*: it involves a change of frame or perspective, venturing into fresh territory and "*doing what we did not do before*" (Norman & Verganti, 2014, p. 82).

The primary differentiation between these two categories of innovation hinges on whether the innovation represents a continuous alteration of established practices (incremental) or something entirely new, distinct, and disruptive (radical). Furthermore, the authors used three criteria proposed by Dahlin & Behrens (2005) to better define radical innovation:

- *Novelty*: the invention must be novel, indicating its distinction from prior inventions.
- *Uniqueness*: it must be distinguishable from other existing inventions.
- *Adoption*: it must be adopted to influence the content of future inventions.

The third criterion is critical because it explains that for an innovation to be considered radical, it must be used and accepted by the market; otherwise, it will fail.

Finally, it is worth noting that radical innovations are quite rare and frequently take a long time to gain acceptance (Norman & Verganti, 2014). Indeed, the authors described them as "*difficult to use, expensive, and limited in capability*" (Norman & Verganti, 2014, p. 84). As a result, incremental innovations are required to transform the radical idea into a form acceptable to consumers.

Hence, both forms of innovation are pivotal. Radical innovation forges new domains and paradigms, laying the foundation for significant transformations. Incremental innovation, conversely, is crucial for realizing the inherent potential value. It is noteworthy that in the absence of radical innovation, incremental enhancements face constraints, and conversely, without incremental innovation, the potential stemming from radical changes is not fully realized (Norman & Verganti, 2014).

2.3.3. Human Centred Design (HCD) and its limits

To understand the origins of Design-Driven innovation theory and its departure from traditional Human-Centred Design (HCD), it is necessary to first establish the fundamental principles that shaped HCD and the context in which it emerged.

The term HCD was coined by Rob Kling in 1977 but gained widespread recognition with the publication of the book "*User-Centred System Design: New Perspectives on Human-Computer Interaction*" (Norman et al., 1986). This approach is based on four core principles**:**

- *People-centred:* emphasize individuals and their contextual needs when developing novel solutions.
- *Understand and address the core problems:* address and resolve the core issues and root causes.

- *Everything is a system:* view everything as interconnected systems with interdependent components.
- *Small and simple interventions:* adopt an incremental approach, using small, simple interventions and learning from each step. Continuously prototype, test, and refine solutions to align them closely with the needs of the target audience.

Furthermore, the HCD process is an iterative approach divided into four stages: 1) Understanding the context of use; 2) Specifying user requirements; 3) Designing solutions; 4) Evaluating against requirements (Agarina et al., 2019).

Each iteration in this process is built upon the lessons learned from the preceding cycle, allowing for continuous refinement and improvement. The HCD journey concludes when the results are not only appropriate but also align with the users' needs and expectations, or when the allocated time for the design process is complete (Norman & Verganti, 2014). This iterative nature of HCD ensures that the final design is finely tuned to meet the real-world requirements and preferences of the people it is intended for (Norman et al., 1986).

Over time, Don Norman began to raise questions about certain aspects of his HCD theory, particularly regarding the suitability of this approach for radical innovations. In 2005, he initiated a critical examination of the core principle of user-centred design, which emphasizes "know your users". This principle highlights the necessity of deeply understanding people and their needs when creating a new product. However, Norman (2005) acknowledged that innovations resulting from the adoption of a HCD approach were considered incremental rather than radical. He examined several examples in an attempt to refute this conclusion, but they all led to the same conclusion: all radical innovations were made without a detailed analysis of user needs, and there is no example of a radical innovation that originated from a user-centred process.

Nevertheless, Norman recognized the pivotal role of HCD in refining and enhancing products once a radical innovation had been introduced. Examples of this can be seen in the post-launch improvements made by tech giants like Google, Facebook, and Twitter, as well as the continuous modifications made by automobile manufacturers in response to user feedback. In essence, while HCD might not drive radical innovation, it played a crucial role in optimizing products once groundbreaking advancements have taken place.

2.3.4. Design-Driven innovation

In this context, where HCD theory was being questioned as insufficient to explain radical innovations, a novel approach known as Design-Driven innovation was developed by Roberto Verganti. Building upon Norman's perspectives, Verganti introduces a pivotal paradigm shift: radical innovations can also emerge through a profound change of meaning. This kind of innovation is driven by design.

In contrast to the HCD approach, where innovations are driven by user requirements, Design-Driven innovations are primarily created by firms' visions regarding potential new product languages and meanings that can permeate society (Dell'Era & Verganti, 2009). This kind of innovation is rooted in Krippendorff (1989)'s interpretation of design "*The etymology of design goes back to the Latin de-signare and means making something, distinguishing it by a sign, giving it significance, designating its relation to other things, owners, users, or gods. Based on this original meaning, one could say: design is making sense (of things)*" (p. 9).

Based on this definition of design, Verganti (2003, 2006) describes Design-Driven innovation as an innovation where the newness of the message and design language takes precedence over the novelty of functionality and technology.

Therefore, the idea behind this theory is that what matters to the user, in addition to the functionality of a product, is its emotional and symbolic value ("meaning"). While functionality aims to satisfy customers' utilitarian needs, the product's meaning goes a step further by engaging their emotional and sociocultural needs. It acts as a vessel for proposing a value system to users, giving the product a distinct personality and identity.

2.3.4.1. Design-Driven theoretical framework

Verganti (2008) proposes a theoretical framework for connecting Design-Driven theory to other theories of innovation. This model, with functionality and meaning on the two axes as shown in Figure 2.4, give a thorough explanation of the mechanisms and drivers behind various innovation paradigms. Whether it involves changes in meaning, functionality, or both, these alterations can occur in a radical or incremental way, giving rise to diverse types of innovation.

Specifically, functionality undergoes a radical transformation when there is a substantial enhancement of technology, while it evolves incrementally when the improvement is more modest. Scholars recognized that radical changes in functionality are mainly technology push whereas minor changes to current technological paradigms are mainly market pull (Dosi, 1982). Regarding meaning, innovation is considered incremental when "*a product adopts a design language and delivers a message that is in line with the current evolution of sociocultural models*" (Verganti, 2008, p. 441). Conversely, it is considered radical when "*a product has a language and delivers a message that implies a significant reinterpretation of meanings*" (Verganti, 2008, p. 441).

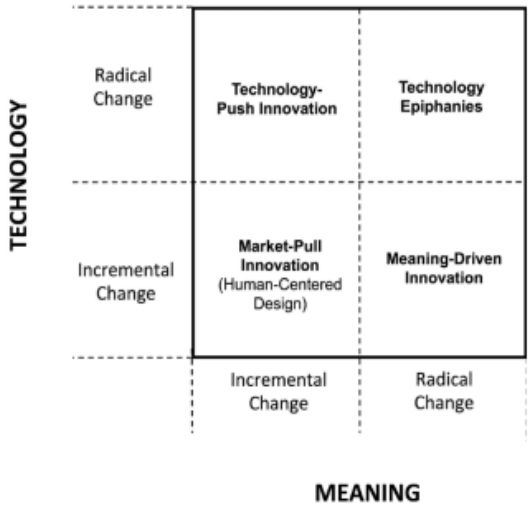
Furthermore, by connecting these two dimensions with the primary drivers of change (technology, design, and users), it is possible to define four types of innovation strategies (Norman & Verganti, 2014) as illustrated in Figure 2.4:

- *Technology-push innovation*. This strategy entails achieving groundbreaking technological advancements while preserving the inherent meaning of the

product. The development of color television exemplifies this, where advances in display technology and color reproduction led to a significant leap forward while maintaining the fundamental function of delivering visual content.

- *Meaning-driven innovation*. It begins with a profound understanding of subtle, implicit dynamics within socio-cultural paradigms and culminates in the emergence of entirely novel meanings and expressions, frequently involving a shift in socio-cultural norms. The introduction of the mini skirt in the 1960s is a prime example of this type of innovation. It was not just a distinct skirt style, but a fundamentally new symbol of women's liberation, representing a radical societal transformation.
- *Technology epiphanies*. These innovations result in a profound change in meaning, achieved through the introduction of new technologies or the creative use of existing technologies in entirely new contexts. The term "*epiphany*" means "*a meaning that assumes a superior position*" and "*a recognition of the fundamental essence or significance of something*" (Norman & Verganti, 2014, p. 90). This superior application of technology is not immediately apparent, as it does not address existing needs and does not originate from users. Instead, it reveals latent meaning when a design challenges prevailing interpretations of a product, leading to the creation of new, unexpected products. An example of this is Nintendo's Wii, a gaming console that revolutionized the gaming experience by transitioning from passive virtual immersion to active physical entertainment.
- *Market-pull innovation*. It starts with a thorough examination of user needs, followed by the development of products designed to meet those needs. Here, both HCD and traditional market-pull methodologies are integrated. The unifying element between these approaches is the foundational emphasis on deriving insights from users to identify potential directions for innovation.

Figure 2.4: Four types of innovation (Norman & Verganti, 2014)



These four types of innovation do not operate in isolation from each other. Indeed, technology-driven innovation necessitates a thorough understanding of market dynamics, whereas meaning-oriented innovation entails examining individuals' aspirations and venturing into novel technological realms (Verganti, 2008). Typically, successful projects incorporate aspects from all these dimensions and what distinguishes them is the driver.

2.3.4.2. Design-Driven innovation process: The Metamodel

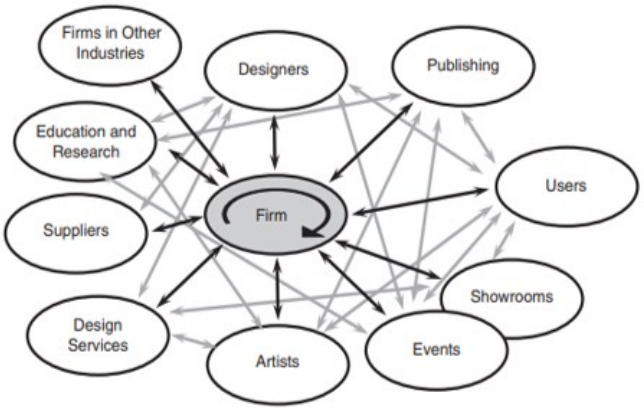
The Metamodel describes the process through which firms, and particularly their managers, can successfully realize Design-Driven innovation (Verganti, 2008, 2009). As described by Verganti (2008), this process, which involves gaining insights into potential future sociocultural developments and creating new product meanings, is challenging to track. Indeed, knowledge about the subtle and unexpressed dynamics of sociocultural models is tacit and widely distributed.

In the Metamodel, a company's capacity to grasp and shape the emergence of new product meanings hinges on collaboration with external interpreters, such as experts, architects, artists, and others, who face similar challenges in understanding societal shifts and proposing innovative visions. These interpreters collectively engage in a dynamic exchange, termed here as the "design discourse," where they explore and experiment with meanings and languages. Effectively managing Design-Driven innovation means navigating this design discourse to access, exchange, and integrate knowledge on product languages, as well as to influence broader cultural trends (Verganti, 2008, 2009).

Furthermore, these key interpreters act as "seducers" as they influence societal models and guide the public's meanings, aspirations, and desires. Collaborating with them not only helps a company better understand and influence societal models but also amplifies the chances of pioneering innovations that resonate and succeed in future markets (Verganti, 2008, 2009).

Therefore, knowledge is not concentrated in a single repository from which all information about future scenarios can be retrieved. Instead, it is distributed throughout our environment in a sort of collective design discourse (Figure 2.5). This is why the introduction of radical Design-Driven innovations necessitates the creation of multiple channels to access tacit and distributed knowledge about sociocultural trends (Dell'Era & Verganti, 2009).

Figure 2.5: The design discourse surrounding a firm (Verganti, 2008)



In Verganti's seminal work in 2008, he succinctly outlines the key characteristics of the process as follows:

- It is a networked research process.
- It spans widely outside the boundaries of the firm, including several key external interpreters.
- It is based on sharing of knowledge (about sociocultural models, meanings, and product languages).
- It includes an action of influencing and modifying (through the interpreters themselves and their influencing and seductive power) the sociocultural regime.

Moreover, in his subsequent work in 2009, he provides a more intricate, step-by-step delineation of the process:

1. *Listening the design discourse ("Understand")*

   The initial step entails acquiring insights into the potential meanings and languages associated with new products. Companies actively seek to identify the sources of this knowledge and the means to incorporate it into their processes. This phase involves the identification and engagement of key interpreters. A crucial criterion is the selection of individuals who can serve as bridges, connecting diverse perspectives from outside the industry but within the same life context.

2. *Interpreting ("Anticipate")*

   In this phase the company develops its own vision and proposal for a completely new meaning and language. It involves collecting and reinterpreting design discourse data as well as conducting internal research and experimentation to produce new radical innovation.

3. *Addressing the design discourse ("Influence")*

   Addressing the design discourse implies diffusing the new vision to the variety of interpreters. It also consists of defining the most appropriate means through which interpreters can discuss and then internalize those new proposals. Design-Driven businesses rely on cultural prototypes to address design discourse. Books, exhibitions, cultural events, concept products on display at fairs, journal articles, conference presentations, corporate showrooms, websites, special products for pioneering projects, and design competitions are all examples of prototypes. A cultural prototype serves to communicate the designer's vision to the rest of the world in a language that is distinct from marketing and communication strategies. Unlike a product promotional brochure, is intended for interpreters rather than end-users.

2.3.5. Translating Design-Driven concepts to public policy

Verganti's (2008) theory proposes that innovation can be driven by radical and incremental changes in functionality or meaning (or both). To understand how Design-Driven theory can help explain policy changes, it is necessary to first define how the concepts of meaning and functionality can be translated into the domain of public policy (Figure 2.6).

2.3.5.1. Meaning and policy image

According to Verganti (2008), meaning is the set of messages that a product conveys using design language, which are design choices aimed at communicating a coherent and consistent message regarding a product's identity, purpose, and user experience. Innovation in meaning can take two primary forms: incremental and radical. When a product aligns its design and message with the current socio-cultural models, it generates an incremental change. Users perceive it as fashionable and stylish, adhering to established standards of beauty and language. Conversely, radical change occurs when a product adopts a language and message that significantly reinterprets existing meanings (Verganti, 2008).

This concept of meaning can be readily applied to the domain of public policy innovation. Indeed, within PET, an analogous term to Verganti's (2008) definition of meaning emerges, known as "policy image". Policy image describes how "*public policies are portrayed and discussed in the public sphere and in the media*" (Baumgarter and Jones, 1991, p. 1046). Similar to how Verganti (2008) defined meaning as the set of values and messages that a product conveyed, policy image is the language and set of values attached to a policy.

Furthermore, Baumgartner & Jones (1991), mirroring Verganti's (2008) approach, highlight the role of policy image in determining change and its importance in driving radical innovation. Indeed, as described by PET, during periods of stability the policy

image changes incrementally, remaining consistent with current socio-cultural patterns, and subsystems tend to sustain the current image. In contrast, during phases of punctuation, a significantly different image emerges that challenges the current one, leading to radical change.

Moreover, Baumgartner & Jones (1991) emphasize the role of the policymaker, who can be defined as the policy designer, in influencing radical change of policy image, similarly to the way Verganti (2008) points out the importance of the designer's role in creating radical innovative meanings for products.

In conclusion, employing terminology from both theories, the definition of meaning in the realm of public policy innovation used in this research project's is "*the vision, approach, and language attributed to the policy*".

2.3.5.2. Functionality and policy instruments

According to Verganti's (2008) definition, the term functionality corresponds to "technology" which represents the set of performances, capabilities, or operations that a technological product can execute based on its technical specifications. These technical characteristics depends on the way in which the technological product has been designed.

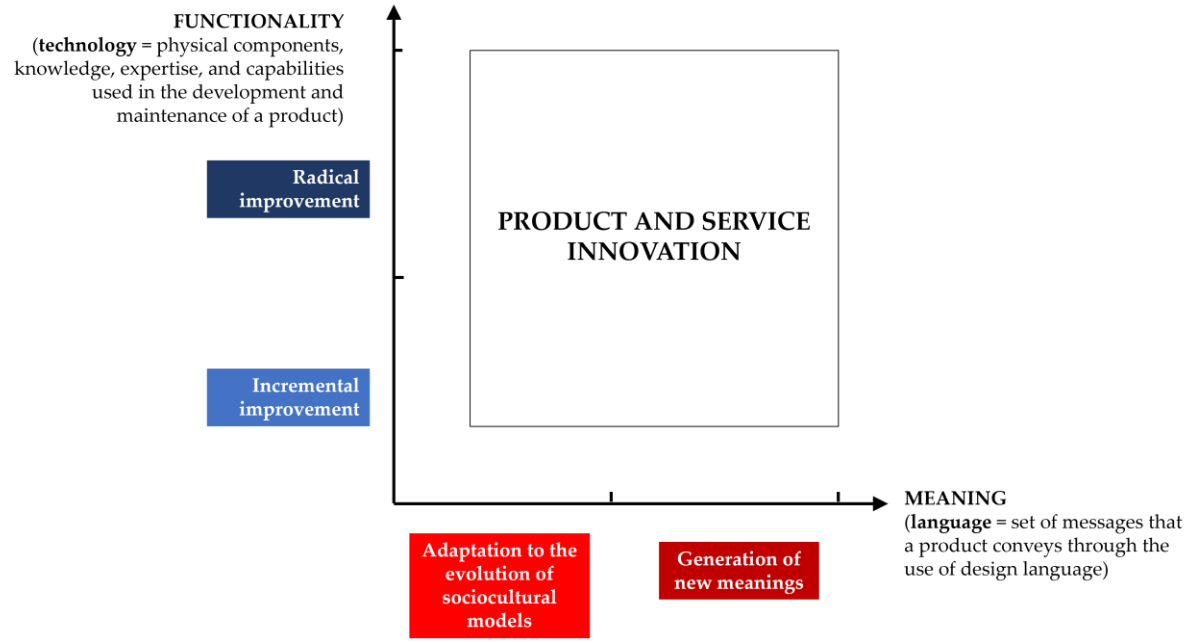
This definition of functionality can be translated into the context of public policy, where it assumes a similar meaning as "set of techniques" referred to as "policy instruments", which have been designed by policymakers to achieve specific outcomes or desired effects. Indeed, Howlett (2005) defines these "*policy instrument*s" as governance techniques that involve, in one way or another, the use of state authority or its conscious limitations.

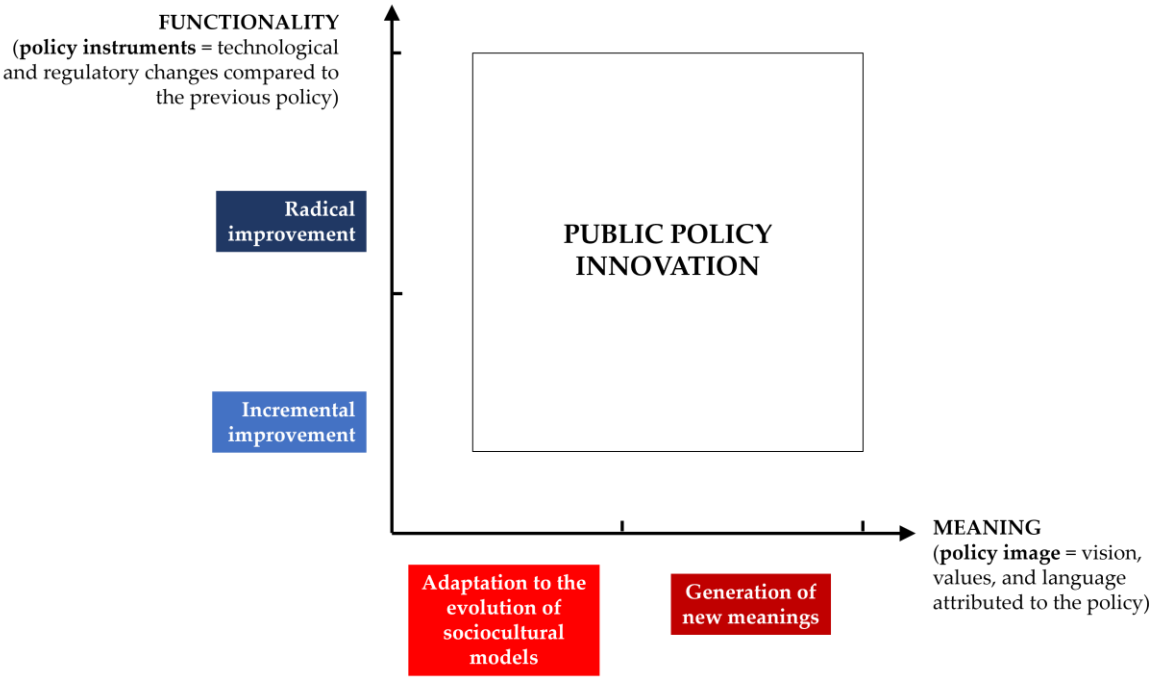
In a general sense, policy instruments encompass a range of mechanisms, including technological and regulatory changes, alongside the introduction of a new policy image. These tools are the means trough which policymakers actualize policies and strive to attain their intended results. However, within the scope of this thesis, which independently scrutinizes the shift in policy image, the term "*policy instruments*" is specifically limited to the realm of technological and regulatory changes brought about by the new policy.

Moreover, as outlined by Verganti (2008), changes in product's functionality, whether radical or incremental, can result in corresponding innovations that are equally radical or incremental. Likewise, policy instruments have a significant impact on the evolution of policy innovation, shaping the way in which policy change unfolds.

In conclusion, within the scope of this research focused on innovation in public policy, the concept of functionality is that of "*policy instruments*", excluding policy image. The innovation will be considered radical to the extent that the instruments provided by the new policy differ significantly from those used in the previous policy, otherwise it is incremental.

Figure 2.6: Translating concepts of meaning and functionality to public policy





2.3.6. Factors influencing change and innovation in organisations

The examination of Baumgartner & Jones' theory (1991) in the initial section of the literature review revealed limitations in assessing micro-level dynamics and stakeholders' characteristics within subsystems that could impact policy change.

Consequently, to gain a better understanding of these subsystems' dynamics, a comprehensive analysis was conducted to identify potential factors affecting positively change and innovation in organisations.

The analysis was structured by reviewing various papers related to the topics of change management and the organisational, cultural, and process-related factors that facilitate the achievement of radical innovations. Critical and relevant factors identified across multiple papers were selected and categorized as indicated in Table 2.1. Each factor is accompanied by its definition and corresponding references.

Table 2.1: Literature review on factors influencing organisational change

Factor	Definition	Sources
Corporate strategy and vision	Corporate strategy sets the overall mission, direction, and official goals of an organisation; therefore, a strategy on innovation is an important antecedent factor of organisational change and innovation. The vision should be in line with the organisational strategy and outline the characteristics of the idealized future goals as well as the reasons for the change and the anticipated outcomes. For the change initiative to be successful, it is essential that this vision is accepted by all employees and stakeholders.	Stouten et al. (2018); Errida & Lofti (2021); Uachotikoon & Utsahajit (2019); Alqarni et al. (2022)
Monitoring and measurement	Monitoring and measurement can facilitate innovation in several ways, including identifying areas for improvement, measuring progress, and providing feedback on change efforts. Furthermore, they encourage experimentation by offering a means to test innovative ideas and approaches while simultaneously measuring their effectiveness.	Mento et al. (2002); Prosci (2017); Stouten et al. (2018); Errida & Lofti (2021); Alqarni et al. (2022);
Organisational readiness and capacity for change	Organisations should have sufficient and adequate financial, material, and human resources to support change. Additionally, they must have the managerial and organisational capabilities required for developing, executing, and continuously adapting to changes in both the environmental and organisational landscapes.	Stouten et al. (2018); Errida & Lofti (2021); Alqarni et al. (2022)

Visionary leadership	Leaders play a critical role in encouraging and facilitating collective learning and creating the climate for innovation through their remarks and behaviours. They manage the organisation's goals, providing support to teams and individuals as they translate their creative efforts into tangible innovations.	Stouten et al. (2018); Uachotikoon & Utsahajit (2019); Errida & Lofti (2021); Alqarni et al. (2022)
Effective communication	Maintaining effective and consistent communication within organisations and among external stakeholders is a critical element for achieving success in change efforts, and it significantly contributes to increasing collaboration and cultivating internal readiness for change.	Mento et al. (2002); Stouten et al. (2018); Errida & Lofti (2021); Alqarni et al. (2022)
Creating a conducive and appropriate working environment	To enhance employees' motivation and their commitment to the organisation's objectives, it is imperative for organisations to cultivate an appropriate working environment. The capacity to initiate change is profoundly intertwined with social dynamics, as an individual's receptivity to change can be profoundly shaped by their interpersonal connections within the company. Therefore, the workplace must be distinguished by qualities such as mutual respect, trust, transparency, and cooperation among the different divisions and personnel within the organisation.	Stouten et al. (2018); Uachotikoon & Utsahajit (2019); Errida & Lofti (2021); Alqarni et al. (2022)
Collaboration and co-creation with external stakeholders	Engaging in partnerships with external stakeholders can exert a substantial influence on an organisation's capacity for innovation. Such collaborations grant access to fresh insights, valuable resources, and an extended network, all of which are pivotal in driving innovation. Moreover, when diverse stakeholders come together, their varying ideas, goals, and viewpoints can blend to produce truly unique and forward-thinking solutions. This fusion of diverse insights can be a driving force behind groundbreaking innovations.	García-Sánchez et al. (2018); Uachotikoon & Utsahajit (2019); Yong et al. (2022)
Organic organisational structure	An organic organisation is very adaptable and responsive to changes. Its structure is defined as having few layers of management, little job specialization, decentralized decision-making, and little direct supervision. Therefore, an organisation with this structure favour innovation.	Stouten et al. (2018); Uachotikoon & Utsahajit (2019); Alqarni et al., (2022)

Experimental approach and risk-taking culture	A risk-taking and experimental culture in organisations means creating an environment that supports and encourages employees to take risks, experiment with innovative ideas, and challenge the status quo. This can significantly influence innovation in organisations by encouraging creativity, learning from failure, enhancing collaboration, and facilitating adaptability.	Koberg et al. (2003); Uachotikoon & Utsahajit (2019); Errida & Lofti (2021); Alqarni et al. (2022)
Workplace diversity	Age, skills, gender, ethnicity diversity in workplace influence the development of innovation or an innovative attitude inside organisations by bringing multiple perspective and ideas.	Alqaurni et al. (2022); Stouten et al. (2018); Uachotikoon & Utsahajit (2019)
Training and coaching of employees	Training and coaching can significantly influence innovation inside the organisation by developing a culture of innovation, overcoming obstacles, fostering creativity, and providing new methodologies and tools. By investing in training and coaching, organisations can equip their employees with the skills and mindset needed to generate and implement innovative ideas, leading to improved business outcomes.	Prosci (2017); Errida & Lofti (2021); Alqarni et al. (2022)
Knowledge and creativity skills of employees	Knowledge refers to an individual's expertise and skills, particularly within a specific domain. This knowledge is the foundation for all creative thinking and innovative endeavours. Creativity skills refer to an individual's problem-solving abilities, cognitive approach, and work style. These aspects are critical not only during the initial stages of developing innovative ideas, but also throughout the iterative process during the implementation phase. In essence, knowledge is the foundation, and creativity skills are the tools for nurturing and developing innovative ideas.	Stouten et al. (2018); Uachotikoon & Utsahajit (2019); Errida & Lofti (2021); Alqarni et al. (2022)
Autonomy and empowerment of employees	Autonomy and empowerment are key factors in facilitating innovation in organisations because they foster employees' sense of ownership, motivation, and commitment, enabling them to unleash their full potential. Empowered employees are more likely to take risks and experiment with different ideas, leading to the development of breakthrough innovations.	Stouten et al. (2018); Domínguez-Escrig et al. (2019); Errida et al (2021); Alqarni et al. (2022)

Psychological state and attitude of employees	Psychological elements are believed to significantly affect innovativeness at the individual level. Scholars agree that intrinsic motivation is extremely important for innovation. Specifically, proactive personality, self-efficacy, self-esteem, tolerance of ambiguity, openness to experience personality, and social network ability are considered personality traits of employees that positively affect the innovation capabilities of the organisation.	Stouten et al. (2018); Errida et al (2021); Alqarni et al. (2022);

2.4. State of the Art: Digital Inequalities

This section of the literature review focuses on gaining a better understanding of this thesis's selected case study, specifically the Digital Civilian Service. This policy is part of a larger set of policies aimed at bridging digital inequalities, with the objective of ensuring that all individuals have the necessary skills and knowledge to use digital technologies effectively. In particular, this section initially explores the evolution of the term digital divide and provides a clear definition of what is meant by digital inequalities. Finally, it delves into the second-level digital divide policies, categorizing them based on their target demographics.

2.4.1. From digital divide to digital inequalities

The term digital divide was coined in the early 1980s by the Maitland Commission and was among the first globally recognized terms used to describe the social impact of ICTs (Larghi et al., 2015). Its popularity peaked in the 1990s when it was used to describe the perceived growing gap between those who have access and skills to use ICT and those who have limited or no access due to a variety of socioeconomic and/or geographical factors.

Numerous studies and reports have shown that simply providing access is not the only way to bridge the divide. Indeed, scholars and policymakers are increasingly recognizing that the digital divide is a social problem intertwined with social systems and communication technologies. Therefore, technological disparity goes beyond access to hardware and software to include differences in service availability, awareness and proficiency with innovative technologies, and the ability to learn and use new media (Gamage & Halpin, 2007).

In his book, van Dijk (2020) provides a specific analysis of the evolution of the term digital divide, which can be summarized as follows:

- *1st phase (1999–2002): First-level digital divide*

  The first-level digital divide focuses on physical access to information and communication technologies (ICTs), emphasizing the uneven distribution of

infrastructure such as internet connectivity, computers, and other digital devices. The digital divide in this phase is seen as a simple dichotomous phenomenon, which means a simple separation between "haves" and "have nots"; the "haves" have access to computers and the Internet and the "have nots" do not. This level primarily addresses the fundamental question of who has and who does not have access to digital resources neglecting the influence of IT literacy and its impact on access.

- *2nd phase: 2003-2015: Second-level digital divide*

  The second-level digital divide delves deeper into the issue, exploring disparities in digital literacy and skills. IT skills encompass the knowledge and competences essential for effective IT use, both technical abilities (e.g., operating hardware and software) and information literacy (e.g., discerning when information can address a problem). Mere access to technology proves insufficient if individuals lack the necessary expertise to utilize it effectively.

- *3rd phase – currently: Third-level digital divide*

  The third-level digital divide expands the scope further to encompass the sociocultural and socio-economic dimensions of ICT access and use. It considers factors like age, gender, income, education level, race, and other societal characteristics that can influence individuals' digital opportunities and outcomes. This level explores how social and economic inequalities intersect with technology access and skills, and how they can reinforce or exacerbate existing disparities. The idea is to understand who benefits the most and who is left behind in terms of digital inclusion. Digital inclusion is a broader term that recognizes the underlying social conditions that determine both access to and active participation in ICT (Pendell et al., 2013).

This evolution has resulted in a shift from the concept of digital divide to that of digital inequality, reflecting a recognition that digital exclusion and disparities are deeply rooted in social, economic, and systemic factors. It emphasizes the importance of addressing the underlying social and structural inequalities that contribute to unequal digital resource distribution and utilization (Klecun, 2008). Nowadays, the central concern is not merely about internet access but what people are able to do when they have access to the Internet.

Overcoming these barriers requires targeted programs for vulnerable populations and a focus on adult education initiatives (Palmeiro et al., 2019). In addition, the presence of pre-existing social inequalities has a significant impact on how digital inequality is shaped. One key observation is that as social inequality increases, it not only leads to digital inequality but also reinforces existing divisions in society (Van Dijk, 2020).

This scenario, wherein disparities rooted in socio-demographic factors such as age, ethnicity, gender, educational background, or economic status exert a significant

influence on individuals' internet usage, their internet-related skills, and the outcomes they derive from it, is referred to as the stratification hypothesis (Zilian & Zilian, 2020). The fundamental concept underpinning this hypothesis is that individuals with more socio-economic resources and privileged backgrounds tend to use the internet in ways that benefit them personally and lead to higher levels of expertise and autonomy in internet use.

To gain a comprehensive understanding of the digital divide and the initiatives designed to bridge it, it is essential to familiarize ourselves with the key terms used in this context, such as digital literacy and competences.

2.4.2. Defining digital literacy and digital competences

In contemporary society, digital literacy and competences have emerged as crucial topics in discussions concerning the essential skills needed for active citizen participation. In order to reduce the risks of digital exclusion, it is crucial to consistently update these skills in light of the ongoing evolution of digital technology and services. Indeed, digital exclusion extends beyond mere access limitations; it encompasses the shortfall in digital literacy and competences (Bejaković & Mrnjavac, 2020).

Various definitions of digital literacy exist in the literature. The Digital Literacy Task Force of the American Library Association (2013) describes it as "*the ability to use information and communication technologies to find, understand, evaluate, create, and communicate digital information, requiring both cognitive and technical skills*". While digital literacy is frequently used interchangeably with digital competence, it is important to note that digital literacy establishes a foundational understanding, whereas digital competences go beyond basic skills and they encompass not only technical proficiency but also advanced cognitive abilities, as well as social and emotional aptitudes. To be more precise, digital competences have been defined as "*the confident, critical, and responsible use of, and engagement with, digital technologies for learning, work, and participation in society. It involves a combination of knowledge, skills, and attitudes*" (Council Recommendation on Key Competences for Lifelong Learning, 2018).

In order to classify digital competences, the Digital Competence Framework for Citizens (DigComp) was used. This framework is implemented by the Joint Research Centre on behalf of the European Commission and has been in operation since 2010. Over time, DigComp has gained recognition among Member States as the EU-wide framework for shaping digital skills policies, developing, and advancing the assessment of digital competences. It plays a significant role in the EU's objectives of enhancing digital skills across the population and is utilized for various purposes such as designing competence assessment tools, creating training programs and materials, and identifying professional digital profiles within the domains of employment, education, training, and social inclusion.

Specifically, DigComp 2.2 (Vuorikari et al., 2022), the fourth iteration of the framework released in March 2022, outlines the essential elements of digital competence across five areas (information and data literacy, communication and collaboration, digital content creation, safety, problem solving) and it encompasses 21 specific competences. The framework further provides descriptions of eight proficiency levels, along with examples of knowledge, skills, and attitudes associated with each level. Additionally, it offers practical use cases demonstrating the application of digital competence in both educational and employment contexts.

This framework served as a reference for SCD organisations to align their interventions. Its significance lies in its dual role: determining the prioritized modules in volunteer training and indicating the competences for which "eFacilitators" can obtain certification upon completing their service. Moreover, it indirectly assists stakeholders in identifying the necessary priorities for designing interventions that target disadvantaged groups.

2.4.3. Second-level digital divide policies

In this second part of the section, a literature review that delves into the policies implemented to bridge the second-level digital divide is presented. These interventions share a common objective, which is to enhance digital competences among the population. Different interventions have been grouped according to their types, their specific objectives, and the target populations they are intended to address.

In the literature, numerous initiatives aiming to bridge the digital dividecan be found. However, to identify intervention types that are consistent and comparable with SCD, the following approach was adopted:

- First, it was decided to exclude all papers discussing interventions in countries with medium or low income according to the World Bank.
- Second, the focus was solely on interventions that addressed initiatives aimed at tackling the second-level digital divide, providing skills to the targeted population of the intervention.

From the analysis of the selected papers, it was possible to group the intervention types into five categories, described in Table 2.2.

Table 2.2: Typology of intervention

Intervention	Definition
Training	Frontal education or courses that focuses on teaching individuals the necessary digital skills to thrive in the digital age. They are typically provided by teachers or experts in the sector.
Workshops	Interactive learning session aimed at enhancing participants' proficiency in using digital technology effectively. The content of each session is usually flexible and can be adjusted to suit the specific requirements of the participants.
Tutoring	Targeted educational support system where experienced instructors, known as tutors, provide personalized guidance and assistance to individuals facing challenges in accessing and effectively utilizing digital technologies.
Infrastructure provision- public domain	Offering Internet access and/or devices for use in public spaces like telecentres, cybercafés, libraries, computer labs, either at no cost or at a reduced fee. This service typically also includes educational support to help users effectively utilize the devices and services.
Infrastructure provision – private domain (home)	The offer of cost-free or affordable Internet access and/or devices for personal use in private settings (such as homes). Typically, this type of intervention also encompasses technical guidance and assistance.

In the realm of second-level digital divide interventions, a nuanced distinction emerges from the literature analysis: formal and informal education. Formal education refers to a structured and systematic method of learning, typically delivered by qualified instructors and guided by a specific curriculum. In the context of policies addressing the second-level digital divide, formal education can offer organized training and educational programs aimed at assisting individuals in enhancing their digital skills and knowledge.

Conversely, informal education occurs outside the traditional learning environment. Specifically, in the realms of second-level digital divide, it can help individuals develop their digital skills and knowledge through hands on experience, peer support and self-directed learning (Lindsay et al., 2008). Notably, informal, and self-guided learning play an equally vital role alongside formal face-to-face training programs, particularly in acquiring fundamental IT skills (Ferro et al., 2011).

Furthermore, the literature review highlights the significance of social support in facilitating internet use. Indeed, learning is influenced not only by technical aspects but also by social elements, as the expertise within one's social networks can both limit and enhance the learning process (Eynon, 2020).

Finally, it is essential to recognize that the implementation of digital literacy by practitioners is not a mere translation of policies; rather, it heavily depends on the local contexts and cultures within which these practitioners operate.

2.4.4. Target of second-level digital divide policies

The primary target of policy aiming at addressing the second-level digital divide are marginalized individuals, meaning those who are in a disadvantaged or socially and economically excluded position. This marginalization can be attributed to several factors such as age, gender, ethnicity, educational background, or economic status (Zilian & Zilian, 2020).

Over the years, the demographics of these marginalized populations have remained relatively consistent, encompassing:

- lower income
- minority groups (Black, Hispanic, or American Indian/Alaska Native)
- older adults
- adults with less education
- and people with disabilities

To conduct a more detailed analysis of the distinctions between intervention types for various target populations, the previously selected papers, which pertain to interventions in high-income countries, were categorized based on the demographic groups these interventions were designed to address. Table 2.3 is used to classify papers, with a focus on quantifying the number of papers associated with each target category and the number of countries in which the interventions described were implemented.

Table 2.3: Summary dimensions of the papers identified

Dimensions	General population	Older adults	Young people	Migrants	People with disabilities
Number of papers	13	8	4	3	3
Number of countries	9	9	2	2	2

For each of the identified categories, a comprehensive analysis has been conducted, exploring a wide range of interventions employed, their specific objectives, and their achieved outcomes. In the subsequent paragraphs, the main insights are summarized.

2.4.4.1. General population

General population policies target the entire population of a country or an area, with usually a specific focus on those individuals with low-income and below-average levels of education. The specific objectives, identified in the literature of these kinds of policies are:

- Empower the community through the conduction of projects rooted in local conditions with content of relevance to students and local business (Hartviksen et al., 2002).
- Improve workers' employability by fostering the development of advanced digital skills to train a new generation of ICT professionals (Hartviksen et al., 2002).
- Foster citizens participation and inclusion through the use of e-government and public and private digital services (Morte-Nadal & Esteban-Navarro, 2022).
- Help the poor participate in productive parts of society by providing technical and social skills needed to communicate online and compete in a flexible job market (Gordo, 2002).

These policies primarily focus on enhancing digital competences and employ various strategies to achieve this goal. The most common interventions involve training (Kowalska-Chrzanowska et al., 2021), tutoring (Gordo, 2002; Hartviksen et al., 2002; Hick, 2006; Palmeiro et al., 2019), and providing digital infrastructure in both public and private domains.

In many cases, a widespread intervention involves establishing community technology centers (CTC). These centers provide citizens with access to technology, courses, and assistance from tutors to learn how to perform various digital operations (Gordo, 2002; Hartviksen et al., 2002; Hick, 2006; Palmeiro et al., 2019). People go to CTC not only to learn about ICT but also for improving their economic status and social inclusion (Kvasny, 2006).

Over time, these centers have gradually expanded their course offerings, evolving from basic digital literacy classes to more advanced and specialized courses. This expansion caters to the needs of individuals who are already well-prepared and fosters talent development among citizens, empowering them, for example, to excel as skilled programmers (Hartviksen et al., 2002).

2.4.4.2. Older adults

Older adults typically refer to those in the later stages of adulthood, with the age range varying based on cultural and institutional factors. In this context, they are individuals aged 50 or older, a threshold commonly used in relevant policies. This group, particularly those over 65, is often stereotyped in academic and popular discourse as

homogeneous, characterized by technophobia, digital illiteracy, and a reluctance to use technology.

In particular, Jimoyiannis & Gravani (2011) identified four key barriers to adult digital literacy:

- Personal factors: lack of confidence and fear of technology
- Learning factors: existing learning habits
- Pedagogical factors among educators: inadequate training and lack of collaboration.
- School-related factors: technical and issues and infrastructure quality.

Furthermore, the objectives of older adults' policies, though slightly different depending on age, can be categorize as follows:

- Reduce the generational gender divide by improving older adult confidence and skills in using technology (Jimoyiannis & Gravani, 2011; Pendell et al., 2013).
- Reduce loneliness and isolation (Neves et al., 2018).
- Improve the quality of life during old age, allowing individuals to lead a more fulfilling and active life. This can be achieved by providing essential tools and support that encourage their active participation in society (Abad, 2014).
- Favour intergenerational learning (Neves et al., 2018; Passey, 2014).

To address the digital divide and enhance the digital skills of older adults, key interventions primarily revolve around training, tutoring, and workshops. Two predominant models are utilized for these interventions: the classroom-based model and the self-paced model (Pendell et al., 2013). In the classroom-based model, experienced learners may get frustrated waiting for new students, while new ones may feel embarrassed lagging behind. Striking a balance between more and less experienced participants can mitigate these issues, fostering an environment where seasoned learners support newcomers, ultimately reducing dropout rates. On the other hand, the self-paced model allows independent learning at one's own pace and specific goals (Pendell et al., 2013).

Moreover, Knowles (1990) identifies key characteristics of adult learners relevant to ICT learning and skills development, including a preference for self-directed learning, valuing prior experiences and interests, adopting a task-based approach, and recognizing the importance of the broader social context in ICT skill development. Digital initiatives for the elderly should focus on integrating ICT into various aspects of their well-being, bridging the digital divide by understanding how ICT can benefit their personal and social situations.

2.4.4.3. Young people

The term young people typically encompass individuals in their adolescence and early adulthood, generally ranging from around 13 to 25 years old, with some variation based on cultural and contextual factors. In addition, most programs discussed in the literature are based in educational settings, and they all aim to empower youth with digital skills. Depending on the typology of intervention, some more specific objectives may be identified:

- Provide connectivity, devices, and training to young people and/or their families and/or their teachers to close the digital gap between them and their peers, also in view of enhancing their performance at school or at work (Gibbs et al., 2009; Peña-López, 2010; Riso et al., 2020).
- Improve their ICT skills to find a job in an ever-growing digital society (Bejaković & Mrnjavac, 2020)

In line with the first goal, some programs, such as the *"NEU PC Plus Program"* and the *"Digital Bridge Project"* (Wong et al., 2009), provide devices to poor children and poor families with school-aged children, respectively. Indeed, students from wealthier backgrounds have an advantage in digital skills due to access and family support, while disadvantaged students lack resources. Public interventions are necessary to address this gap and distribute devices to less privileged children and families, thus maximizing the programs' social impact (Larghi et al., 2015).

Furthermore, other programs, like the "*Connecting Equality Program*" (Larghi et al., 2015) and the "*Bridging the Digital Divide Program*" (Gibbs et al., 2009), aim to not only distribute technology in schools but also to provide digital skills training to students and teachers. To ensure the success of such interventions, teachers must possess the capacity to adeptly integrate technology into their classrooms (Gibbs et al., 2009). Therefore, the implementation of effective professional development programs and classroom support for educators becomes imperative.

The second objective, aimed at enhancing the ICT skills of young people to better prepare them for employment in an ever-expanding digital society, encompasses programs that students willingly engage in to craft competitive curriculum profiles that address labour market needs. These initiatives extensively leverage workshops to cultivate specific skills, such as coding, which are directly applicable to the job market (Bejaković & Mrnjavac, 2020).

2.4.4.4. Migrants

The existing literature concerning digital competence policies for migrants is notably constrained in its scope, and the generalizability of findings from case studies may be challenged by the inherent diversity of migrants' backgrounds and the multifaceted motivations that underlie their migration journeys. This diversity encompasses a wide range of cultural, educational, linguistic, and socioeconomic backgrounds, making it

imperative to recognize that one-size-fits-all policy approaches may not adequately address the complex and multifaceted needs of this diverse population.

For instance, in a study conducted by Noguerón-Liu (2017) focusing on Spanish-speaking immigrant parents in schools with technology initiatives, it was evident that the experiences of immigrant families varied based on their pre-migration resources and education levels. These factors had a direct impact on their utilization of digital devices. Moreover, the study underlines how rules and restrictions influenced their adaptation to technology, emphasizing the importance of involving parents and addressing the diverse needs of students. Additionally, the study highlights the significant role that community libraries play in promoting digital inclusion for foreign-born individuals.

In another research conducted by Berger & Croll (2012) in Germany, the focus was on a training course conducted in the Russian language for young migrants from Russia. The objective of this course was to address the educational disadvantages faced by young students with migrant backgrounds in Germany. The study's findings indicated that providing training in the participants' mother tongue significantly bolstered their motivation to learn, with students valuing the use of spoken Russian during the training sessions. It was suggested that providing written materials in both German and Russian would be beneficial. Therefore, the creation of a welcoming and inclusive atmosphere within the group, coupled with the teacher's use of the students' native language, contributed to a highly supportive learning environment.

Consequently, it is imperative that interventions designed to support immigrants comprehensively address the myriad of challenges they encounter, including language barriers, limited resources, social isolation, and experiences of discrimination. Engaging immigrants in the process of program development and delivering instruction and support in a language they are comfortable with can substantially enhance their learning experience, foster greater engagement, and, ultimately, lead to more successful integration.

2.4.4.5. People with disability

There is a notable scarcity of literature addressing individuals with disabilities, a considerable gap that becomes even more significant when considering the substantial population of people with disabilities within the European Union. Indeed, one in four European adults, meaning 87 million people, are estimated by the European Council to have some form of disability (Eurostat, 2022). Furthermore, it is crucial to recognize the broad spectrum of disabilities, which can encompass a diverse range, including cognitive and physical impairments. The specific type of disability significantly shapes how individuals interact with the internet and acquire digital skills.

Among the papers scrutinized, only one focuses specifically on an initiative designed for people with disabilities (Berger & Croll, 2012). The other papers discuss

interventions aimed at a wider audience, including individuals with disabilities (Noh, 2019; Park & Kim, 2014). These interventions are categorized as training programs that encompass computer classes. To ensure that individuals with disabilities can effectively utilize computers, it is imperative to provide them with accessible devices, a practice successfully implemented by libraries in South Korea (Noh, 2019).

Berger & Croll (2012) conducted a study on training visually impaired elderly individuals in basic Internet skills. The course's key success factor was the tutor's intimate knowledge of the disability. The trainer, a blind teacher with expertise in pedagogy for blind individuals, focused on teaching skills like sending and receiving emails, writing and file management. Despite being considered intense by some, most attendees completed the course. Accessible facilities and equipment allowed them to independently manage their daily routines, which was highly appreciated.

3 Knowledge Gaps and Research Questions

PET explains how the interaction between policy image and policy venues drives period of stability and change in public policies. As illustrated in previous chapters, public policies remain stable and undergo incremental change when the policy image and policy venue remain unchanged, thus reinforcing the stability of existing policies and current subsystem. In contrast, radical change occurs when certain factors or events bring about a significant change in policy image or policy venues, breaking existing policy monopolies and causing drastic changes in public policies. Punctuations can be triggered by a variety of factors, such as critical events, changes in public opinion, or the emergence of new information that changes the perception of an issue.

According to Baumgartner & Jones (1991), each of these radical innovations is associated with a significant budget variation. However, empirical evidence suggests otherwise. For instance, examining the Digital Civilian Service in Italy, three main punctuations can be seen. First, when it was established in 1972 as an alternative to compulsory military service. Then, when compulsory military service was abolished, in 2001. Finally, with the introduction of thematic programmes such as the Digital Civilian Service (2020-21). However, contrary to what the PET states, none of these punctuations have been accompanied by a significant budget variation.

Furthermore, Baumgartner & Jones (1991) describe policy innovation from a macro-level perspective using a descriptive approach. However, their theory lacks a comprehensive analysis of how micro-level dynamics and stakeholders' characteristics within subsystems can potentially influence the policy change process. It is worth noting that the authors themselves acknowledge this limitation in their work.

Therefore, the objective of this research is to create a comprehensive and detailed model to explain the process of innovation in public policy, addressing and overcoming the limitations of PET. The central idea is that this new model may be able to clarify how dynamics at the micro level and stakeholders' characteristics, within subsystems, influence policy change and what considerations policymakers should make when designing policies that aim to generate radical innovations.

3.1.1. Research questions

The hypothesis developed to achieve the research objective is to try to apply Verganti's (2008) Design-Driven innovation theory to overcome the limitations of PET and explain how public policy innovation occurs in more detail. The rationale for selecting this theory is not only driven by its prominence in the literature but also by its shared affinities with the PET.

Firstly, both theories emphasize that radical change can be generated through a significant shift in *meaning*, which PET terms *policy image*. Secondly, the concept of *functionality*, as employed in the Design-Driven theory, can be extended to the domain of public policy redefining it as *policy instruments*. Additionally, both theories acknowledge the duality of change, encompassing both gradual, incremental shifts and profound, radical transformations. Furthermore, Design-driven innovation theory describes innovation from a micro-level perspective, which is one of the main limitations of Baumgartner & Jones' (1991) model that this thesis aims to address. Indeed, Verganti's primary unit of analysis is the entrepreneur (or the firm), which represents a microeconomic unit. In contrast, PET directs its attention to the political system and the public sector, constituting a macroeconomic aggregate.

Based on these assumptions, the following chapters will assess the actual applicability of Design-Driven innovation theory in the context of public policy as well as whether modifications are required to transfer it to a different domain. Finally, it will be determined if this model complements or replaces Baumgartner & Jones (1991)' one.

To undertake this task, the research questions were framed as follows:

- **RQ1:** *Can Verganti's (2008) Design-Driven innovation theory be applied to the context of public policy innovation?*
- **RQ2**: *What adaptations are necessary to make Design-Driven theory relevant and applicable to the domain of public policy innovation?*
- **RQ3**: *Does the application of Design-Driven theory to public policy provide an alternative or complementary explanation of policy innovation compared to Punctuated Equilibrium Theory?*

4 Data and Methodology

This chapter initially outlines the research methodology and the process of data collection employed in this study. Specifically, this thesis utilizes a single case study approach, the Digital Civilian Service, to address the research questions, which revolve around the feasibility of adapting Verganti's (2008) Design-Driven theory to overcome the limitations of PET. Subsequently, the data analysis process is described.

4.1. Research design

Research design is fundamentally concerned with how authors report on how their research has been conducted (Ashworth et al., 2019). In the context of this thesis, I have employed a qualitative research approach based on a single case study. According to Thompson (2022), qualitative analysis is the interpretive journey taken by a researcher to extract meaning from a dataset. The responsibility of the qualitative researcher extends beyond the presentation of raw data in the form of transcribed narratives; rather, it entails the condensation, synthesis, and restructuring of information into a coherent narrative. This approach enables readers to visualize and comprehend the findings' theoretical and practical implications (Miles & Huberman, 1994). The decision to use qualitative research was made because a purely quantitative data analysis would have been insufficient to capture the "*complex social phenomena*" underlying the policy change process (Yin, 2003, p. 2).

Moreover, this study uses a single case study to try to answer the research questions. In detail, a case study is defined as "*an empirical inquiry that investigates a contemporary phenomenon within its real-life context, especially when the boundaries between phenomenon and context are not clearly evident*" (Yin, 2003, p. 13). Therefore, this kind of research design is commonly used when it is desired to study complex phenomena in which contextual conditions have some influence and are not entirely separable from the phenomenon under investigation.

Additionally, Yin (2003) identifies three conditions that determine when it is appropriate to use this research strategy:

1. The focus of the study is to answer "how" and "why" questions.
2. The investigator has little control over events.
3. The focus of the research is on contemporary phenomena.

In the context of this research project, all these conditions are met. Firstly, the research questions were formulated using "how" and "why" questions. Secondly, the researcher lacks control over events and must rely on observation and analysis of real phenomena. Lastly, the phenomenon under examination, which is the public policy of SCD, is currently being implemented.

4.2. Case study selection

This research project is based on the analysis of a single case study: the Italian public policy of Digital Civilian Service. In this section, a description of the case study is provided to better outline the empirical research context, followed by the reasons that led to its selection.

4.2.1. Digital Civilian Service

The Digital Civilian Service (SCD) is a public policy developed in Italy and aimed at promoting digital literacy and inclusion among citizens. Its objective is to educate individuals, enhancing the proportion of the population possessing at least basic digital skills—a vital milestone to achieve widespread digital inclusion. To implement this policy, the Digital Transformation Department (DTD), which is the policymaker, collaborated closely with the Department for Youth Policies (DYP), the owner of the ordinary Universal Civilian Service (SCU).

The peculiarity of this policy is that it not only focuses on traditionally disadvantaged groups, such as the elderly, women in challenging circumstances, low-income families, people with disabilities, migrants, or adults facing poverty and unemployment, but also targets volunteers. These volunteers benefit from training and hands-on experience in SCD projects, taking on roles as "eFacilitators".

4.2.1.1. Type of intervention

This policy encompasses two types of interventions:

- *Facilitation*: these services are offered by public or private entities, providing individualized assistance to users of online services, either through digital assistance points already operating in the organisation, also itinerant, or through services created from scratch as a support of the already implemented user assistance activities. Facilitation services can bridge the gap between technology and users, ensuring that individuals, regardless of their familiarity with digital tools, can effectively navigate and utilize online resources.
- *Digital education*: these services, delivered by public or private entities, actively promote the dissemination of the digital culture and the development of basic and/or advanced digital skills within the community. They achieve this through tailored educational activities and initiatives. These digital education services

empower individuals to become proficient in the use of digital tools, thereby enabling them to participate more fully in the digital age.

4.2.1.2. Stakeholders and program dynamics

In SCD many stakeholders are involved. Both established and emerging Civilian Service organisations and municipalities can independently or collaboratively propose programs (comprising at least two projects) designed to enhance citizens' digital skills. These organisations may tailor their efforts to different demographic marginalized groups based on their organisational missions and local requirements. Additionally, in delivering these services, they may partner with various businesses, associations, and organisations.

Each program is required to engage a minimum of 12 volunteers, with a maximum of 20 for local or regional initiatives, and up to 40 for inter-regional or national projects, ensuring a minimum of 4 volunteers per project. Moreover, each SCU organisation is offered a Capacity Building path on digital topics, run online through webinars, by the two departments with the support of the national public training agency (Formez PA) and of the Digital Agenda Observatory of Politecnico di Milano. Furthermore, "eFacilitators" undergo training at both central and local levels. At the central level, they receive comprehensive training on Civilian Service topics from the DYP. At the local level, organisations to which they are affiliated, and sometimes their partnering entities, offer specialized training in digital topics relevant to the specific projects they are assigned to.

To date, three calls for the SCD have been launched. The first pilot call was introduced in May 2021 to serve as an experimental phase, aimed at testing the policy, collecting data, and refining it for subsequent rounds. The second call, launched in January 2022 and financed with EU NextGen funds, significantly expanded the program's capacity by selecting an additional 2400 young volunteers. Lastly, the third call was launched in July 2023. The overarching objective is to involve a total of 9,700 volunteers over a three-year period. Since the research was conducted before the launch of the third call, the analysis will focus on the first two, pertaining to 2021 and 2022.

4.2.2. Reasons for the selection

I select SCD as the case study for this research because it is particularly suitable for illuminating theoretical gaps and extending the relationships and logic among constructs (Eisenhardt, 1989; Yin, 2003; Eisenhardt & Graebner, 2007). Specifically, the following factors influenced its selection:

- The SCD is a specific, well-defined system, making it easy to observe and analyse. There exists a registry of Civilian Service[4] and also a formal coalition

[4] https://www.politichegiovanili.gov.it/servizio-civile/enti/albo-scu/

of stakeholders *(Repubblica Digitale)*[5], which help to define the subsystem more accurately.

- The SCD belongs to a category entirely different from those studied by Baumgartner & Jones (1991). It falls within the realm of social policies, where innovation implies radical changes in people's behaviours. Consequently, investments in human capital can be substantial but typically smaller in scale compared to investments in physical capital or infrastructure.
- Throughout the history of the Civilian Service (SC), several punctuations have arisen: its inception (1972), the end of compulsory military service (2001), and the establishment of the Digital Civilian Service after the pandemic (2020-21), which is the focus of this thesis. Contrary to the assertions of Baumgartner & Jones (1991), each of these punctuations has not resulted in a significant change in budget allocations.

4.2.3. Units of observation

Within the selected case study, the units of observation of our analysis were the organisational stakeholders involved in the policy. Stakeholders can be subdivided according to their relevance into two groups: primary and secondary. The primary stakeholders, who have a crucial role in the design and implementation of the SCD policy are:

- *Digital Transformation Department (DTD):* it is the policymaker of the Digital Civilian Service because it designs the policy, defining its policy image and policy instruments.
- *Department for Youth Policies (DYP):* it is the gatekeeper because it controls multiple key aspects of the policy, influencing who can participate, which projects can be implemented, and how the program is managed and promoted.
- *Organisations or municipalities that designed Digital Civilian Service programs* (i.e., collections of two or more projects) standalone or together (i.e., co-programming: each organisation is responsible for at least one project of the program).
- *Implementation sites and training sites:* organisations' sites or municipalities where the SCD project actually takes place (i.e., "operative sites" or "host sites" depending on whether they belong to the programming SCU organisation or to other entities available to implement its project) and by all the training sites where facilitators are trained to provide their interventions to citizens in the right way. Sometimes they may overlap with the previous category.

[5] https://repubblicadigitale.innovazione.gov.it/it/chi-siamo/#membri

There are also additional secondary stakeholders, who support and contribute to the implementation of the policy such as organisations and municipalities' partners, certification authorities, tutorship authorities, Formez PA/Intellera, and Digital Agenda Observatory of Politecnico di Milano.

For the purposes of this thesis, I decided to focus the analysis on primary stakeholders, who share the characteristics of being all organisational stakeholders. The reason for restricting the empirical analysis to these categories is that they play a key and direct role in shaping policy change and innovation because they are directly involved in the design (DTD) and implementation (DYP, municipalities, and organisations) of the SCD policy.

4.3. Data collection

Qualitative analysis typically combines data collection methods such as interviews, questionnaires, observations, and archival data like press releases, websites, and news articles (Eisenhardt, 1989). Given the qualitative approach of the research the main data sources were the following:

- *Academic articles*: I performed an extensive literature review to gain comprehensive knowledge about the research topics, which included policy change, PET, innovation models, Design-Driven innovation theory, and second-level digital divide policies. Furthermore, academic articles were used to identify gaps in the existing literature and to formulate specific research questions.
- *Organisation and institutional websites*: these sources were used to gather information about the case study and the units of observation. They specifically provided insights into the core characteristics of the selected stakeholders, their relevant variables, their historical context, and details about their current projects. Furthermore, institutional websites aided in the collection of information related to the policy under consideration.
- *On-site observations:* I conducted three on-site observations at organisations that had implemented the SCD to gain a more detailed and direct understanding of the characteristics and dynamics of the organisations involved.
- *Interviews*: they were conducted with volunteers, OLPs (Local Project Operator), employees, and directors of organisations and municipalities involved in the design and implementation of SCD.

Moreover, since the policy gatekeeper, which is the Department for Youth Policies (DYP), did not agree to be interviewed, the notes taken during the working groups were used as evidence for triangulation.

Interviews were the primary source of data for answering the research questions. The following paragraphs will explain how they were conducted as well as how they were processed and analysed.

4.3.1. Interviewees selection

For the purposes of this project, a total of 34 interviews were conducted. Specifically, 33 interviews were carried out with representatives, employees, Local Project Operators (OLPs), and volunteers from diverse organisations and municipalities. These interviews involved interactions with 27 organisations and 6 municipalities that had implemented the Digital Civilian Service policy. The primary aim of this extensive interview process was to obtain a comprehensive and multifaceted perspective on policy implementation across a wide spectrum of organisations.

Additionally, I conducted one interview with the Digital Transformation Department (DTD), the policymaker of SCD. This interview aimed to elicit insights from the policy's designer, shedding light on their intentions and objectives when designing this policy innovation.

Moreover, the interviewed organisations were highly diverse in various parameters such as history, geographic location, context, and size. The individuals interviewed also exhibited significant differences in their backgrounds, ages, roles, and contexts. This deliberate diversity in the sample selection stems from the belief that any commonalities or recurring themes observed across such a varied group of individuals are more likely to be relevant to a broader, more general population. This approach is crucial in providing robust evidence that the findings extend beyond a specific subset of individuals, a particular organisation, or a single geographical location (Mason, 2002).

Table 4.1 illustrates the interviewee's role and the interview mode (in-person or via Microsoft Teams), thereby improving transparency, and facilitating a clearer understanding of the data collection process.

Table 4.1: Information about the interviews performed

Stakeholder	Role of the interviewees	Means
Organisation 1	▪ OLP ▪ Volunteer ▪ SCD project coordinator	In-person interview
Organisation 2	▪ OLP ▪ SCD project coordinator	Video Interview
Organisation 3	OLP	Video Interview

Organisation 4	▪ OLP ▪ SCD project coordinator ▪ Volunteers	In-person interview
Organisation 5	Responsible for project evaluation and monitoring	Video Interview
Organisation 6	Civilian Service (SC) project coordinator and accredited trainer	Video Interview
Organisation 7	Responsible for coordinating volunteers	Video Interview
Organisation 8	Accredited trainer	Video Interview
Organisation 9	Responsible for the design of SC projects	Video Interview
Organisation 10	▪ SC project coordinator ▪ Responsible for the design of projects	Video Interview
Organisation 11	Accredited trainer	Video Interview
Organisation 12	▪ SC project coordinator ▪ Responsible for coordinating volunteers	Video Interview
Organisation 13	OLP	Video Interview
Organisation 14	▪ SC project coordinator ▪ Responsible for selection and coordination of volunteers	Video Interview
Organisation 15	Responsible for selection and coordination of volunteers	Video Interview
Organisation 16	▪ Legal representative of the organisation ▪ Responsible for the selection and trainer ▪ Responsible for the design of SC projects	Video Interview
Organisation 17	SCD staff coordinator	Video Interview
Organisation 18	SC project designer and monitoring expert	Video Interview
Organisation 19	▪ Accredited trainer ▪ SC project designer and monitoring expert	Video Interview

Organisation 20	SCD project coordinator	Video Interview
Organisation 21	SC project coordinator	Video Interview
Organisation 22	▪ OLP ▪ Volunteer	Video Interview
Organisation 23	▪ SC project coordinator ▪ Responsible for the selection process	Video Interview
Organisation 24	OLP	Video Interview
Organisation 25	▪ National responsible for SCU ▪ SCD project coordinator	Video Interview
Organisation 26	SC project coordinator	Video Interview
Organisation 27	SC project designer and coordinator	Video Interview
Municipality 1	▪ Volunteers ▪ OLP ▪ SCD project coordinator	In-person interview
Municipality 2	SCD project coordinator	Video Interview
Municipality 3	SCD project coordinator	Video Interview
Municipality 4	OLP	Video Interview
Municipality 5	SCD project coordinator	Video Interview
Municipality 6	Responsible for coordinating volunteers	Video Interview
DTD	Policymaker	Video Interview

4.3.2. Interview's structure

The interviews lasted an average of 55 minutes, during which the purpose and scope of the research were first presented, and the informant was then given space to express himself/herself through a series of approximately 10 semi-structured questions. Furthermore, all respondents were assured that their answers would be anonymized and provided access to the recording and complete transcription of their interviews (in Italian). Table 4.2 provides a recap of the main interviews' details.

Table 4.2: Interviews details

Interviews period	March - June
Total number of interviews	34
Total number of individuals interviewed	49
Total interviews time	1870 min ≈ 31 hours
Average interview time	55 min
Average number of questions	8-10

Questions were slightly changed during the data collection process because of the information gradually gathered in the interviews and depending on the role of the respondent. This is consistent with the methodology used. Indeed, the ability to make changes during data collection is a key feature of this kind of research design. If a new data collection opportunity or a fresh line of inquiry emerges during the research, it is reasonable to make slight adjustments to certain questions, particularly if such alterations can enhance the theoretical foundation or yield novel theoretical insights (Eisenhardt, 1989).

4.4. Data analysis

Following the verbatim transcription, each interview was coded using an abductive approach. This coding methodology entails the systematic analysis of data, involving a detailed examination of individual lines or paragraphs to identify and label significant events, experiences, emotions, and other relevant elements as concepts (Strauss & Corbin, 1998). The goal is to create a method that is appropriate for studying a complex phenomenon through a clearly defined process that is dependent on coding, such as by creating categories, notions, and phrases from interviews that are then used to generate theory rather than just collecting data (Glaser & Strauss, 1967).

The coding was done following the Gioia methodology (Gioia et al., 2012). Therefore, a first-order analysis was initially carried out: precise labels were assigned to the significant elements and salient points of the text of the interviews. Following that, a second-order analysis was performed on this initial collection of labels to categorize and cluster them based on their domain of pertinence. Furthermore, these second-order themes were further combined into "aggregate dimensions" to create a data structure, a graphical representation of the progress from raw data to terms and themes in conducting the analysis. This is to verify whether the notions generated are in accordance with the literature and can articulate the witnessed facts and phenomena (Gioia et al., 2012). Figure 4.1 illustrates an example of the Gioia methodology employed in the context of this research.

Furthermore, the coding approach employed in this study was abductive, which integrates elements of both the inductive and deductive approaches (Timmermans & Tavory, 2012). Abductive method was first developed by Peirce (1934) as a way to draw inferences oriented towards theory-building. It starts with a set of theories and extends them by looking for theoretically anomalous empirical cases. Empirical observations are anomalous, novel, or surprising only based on what is already theoretically established or what is expected based on existing theories, which therefore serve as a benchmark to identify unexpected empirical observations (Vila-Henninger et al., 2022). When confronted with such surprising and unexpected data, an abductive researcher must be creative in developing theories that provide a more appropriate and enhanced understanding rooted in the contextual empirical material (Timmermans & Tavory, 2012).

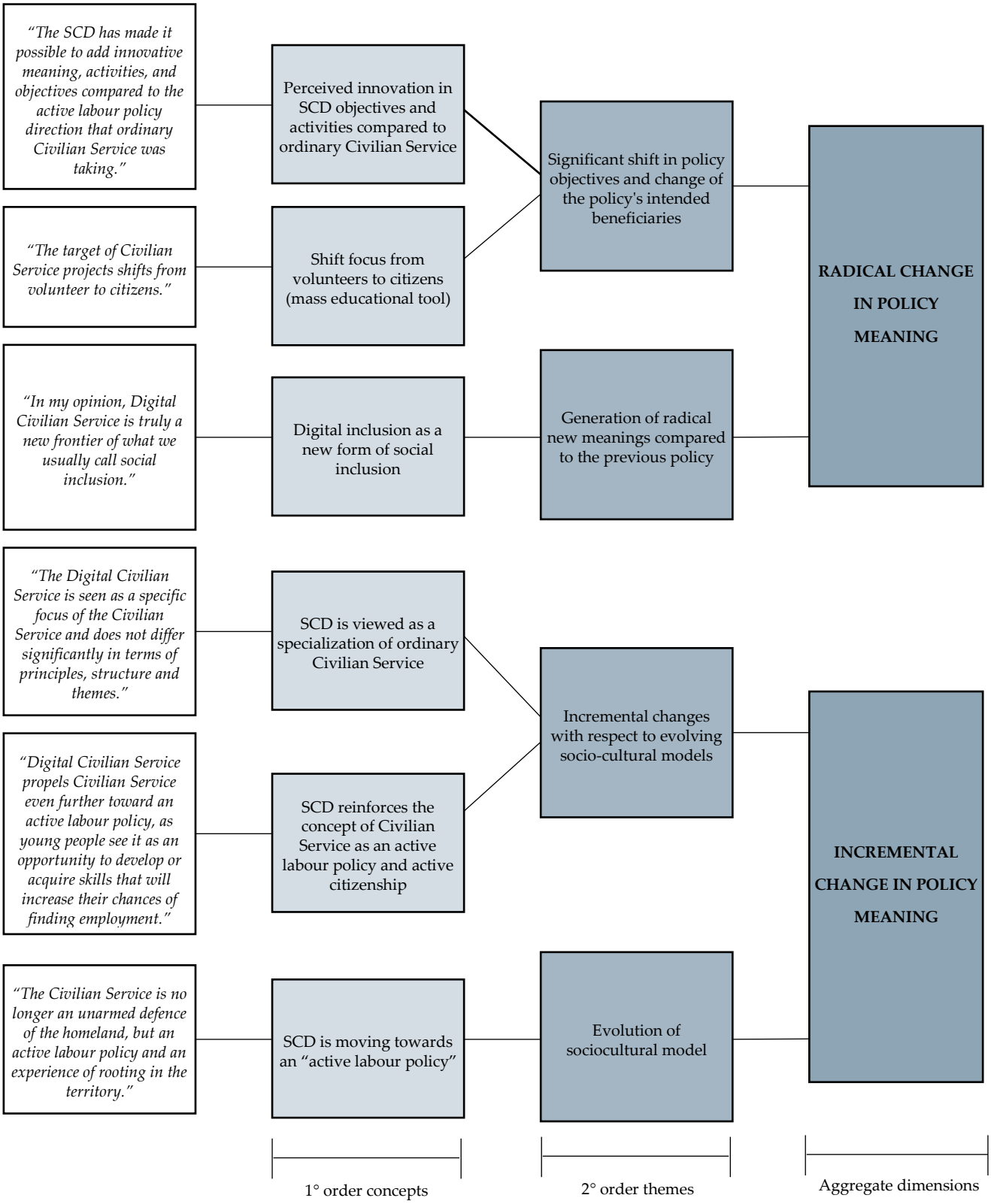
The researcher, by constantly going "back and forth" from one type of research activity to another and between empirical observations and theory, can expand his understanding of both the underlying theory and the empirical phenomena (Dubois & Gadde, 2002). As a result, abductive research is frequently described as a recursive and iterative process wherein theory evolves and is refined through an ongoing interplay between empirical observations and theoretical development (Timmermans & Tavory, 2012).

More precisely, the abductive approach employed in coding the interviews can be articulated as follows:

1. Initially, a deductive approach was applied, focusing on themes related to Design-Driven innovation, specifically meaning and technology. The analysis of these two dimensions, in conjunction with the theory of Baumgartner & Jones (1991), allowed for the recognition of the relevant role of the subsystem, composed of policymakers and stakeholders, in policy innovation process. Additionally, through a more detailed examination of the subsystem, I was able to identify the factors that influence subsystem dynamics along these two dimensions.

2. Subsequently, I adopted an inductive approach to explore the potential inclusion of additional variables necessary for a comprehensive explanation of policy innovation. This inductive coding process uncovered supplementary factors linked to the organisational dynamics of stakeholders. The relevance of these variables and their impact on how organisations react to policy changes found support in the existing literature. As a result, I formulated the hypothesis that these categories could constitute a relevant third dimension, potentially playing a significant role in influencing policy innovation process.
3. The significance of these variables, both in the literature and in empirical observations, in influencing innovation, led to the theorization that a new dimension and further considerations should be added to Verganti (2008)'s theory.

Figure 4.1: Example of Gioia Methodology application



5 Results

This chapter provides an examination of the Digital Civilian Service policy from various analytical perspectives. The overarching objective is to assess the applicability of Verganti's (2008) Design-Driven innovation theory to the domain of public policy, thereby expanding the boundaries of PET (Baumgartner & Jones, 1991). This inquiry seeks to determine whether Verganti's (2008) theory can enhance our understanding of radical innovation in public policy and whether any adaptations are necessary for its effective application. The chapter is organized around the analysis of interviews conducted, which resulted in significant quotes from key stakeholders. This process extracts valuable information to formulate propositions addressing the research questions outlined in Chapter 3.

Specifically, the description of the results is based on the concept of subsystem, which consists of the policymaker, responsible for designing the policy, and its stakeholders, who have a vested interest in the public policy and influence its implementation. In section 5.1, the innovation is examined exclusively from the policymaker's perspective to identify its radical characteristics and points of contact with the Design-Driven innovation theory. This section provides a comprehensive description of the changes introduced in terms of meaning and functionality, as well as the process adopted by the policymaker in designing the innovation, comparing it with Verganti's (2008, 2009) Metamodel. Subsequently, Section 5.2 delves into the results emerging from a comprehensive examination of the entire subsystem, with a particular focus on stakeholders' roles and characteristics. In addition, this section also outlines the four propositions and the motivations behind their formulation.

5.1. Policymaker perspective

Initially, I conducted a comprehensive analysis encompassing the interview with the DTD, who acts as the policymaker for SCD, and the SCD Framework Program (2022). The primary aim of this analysis was to evaluate whether the proposed policy innovation met the criteria of a radical Design-Driven innovation. As part of this examination, I delved into the changes in meaning and technology designed by the policymaker. This analysis also revealed a noteworthy observation: the approach described by the policymaker in the interview to design the radical policy innovation inadvertently mirrored the Metamodel (Verganti, 2008, 2009).

5.1.1. Design-Driven innovation in public policy

The analysis conducted on the interview with the policymaker (DTD) in conjunction with an examination of the information presented in the SCD Framework Program, seeks to provide a more nuanced comprehension of the intended changes in both meaning and functionality that the policymaker aims to generate. Where meaning refers to the vision, approach, and language attributed to the policy (Baumgartner & Jones, 1991), and functionality refers to policy instruments (Howlett, 2005) as illustrated in Section 2.3.5.

5.1.1.1. Radical change in meaning

With respect to the dimension of "meaning", the policymaker's objective is to generate a radical change by imbuing the policy with two entirely new meanings:

1. **Addressing social and digital inequalities simultaneously**. The SCD moves away from the idea of being an "active labour policy" or a "non-armed defence of the homeland". Instead, it evolves into a service that assists people in need while offering support for using digital tools. The central idea is that the digital divide reflects other forms of inequality, and there is a close relationship between social inclusion and digital inclusion. Indeed, addressing one helps tackle the other, and vice versa. Therefore, the primary goal introduced by this policy is to face social inequality by operating on the digital frontier and providing marginalized individuals with a pathway to societal integration.

   The interview with the DTD reveals the policymaker's intention to introduce this radical change in meaning:

   > *"The initial idea envisioned Digital Civilian Service as a means to achieve social inclusion, going beyond the enhancement of digital skills."*

   > *"The objective is to transform the assistance service into something that also provides guidance for the use of digital services, facilitating the integration of socially disadvantaged individuals into society. This approach prioritizes reaching a multitude of smaller, even widely dispersed entities, rather than solely focusing on large numbers. If we consistently manage to engage with all the entities involved in aiding or addressing the needs of the most vulnerable, employing a strategy of capacity building and subsequent volunteer training, then, in my view, we would effectively be pursuing the objectives of the Digital Civilian Service."*

   The SCD Framework Programme (2022) also emphasizes this new meaning:

   > *"The Civilian Service represents a lever for social inclusion, both through the entities that implement programs and projects, and through the young volunteer themselves."*

2. **From volunteer-centric to citizen-centric service.** In contrast to the SCU, which primarily target volunteers and aims to nurture their personal growth and development, the SCD shifts its core focus to a citizen-centric approach. The primary goal here is to put citizen service delivery at the forefront of this transformation.

   The interview with the policymaker reveals the focus on citizens:

   > *"The idea is to focus on citizens, guiding them in the use of digital technology."*

   Likewise, the SCD Framework Program (2022) underscores this shift from a volunteer-centric to a citizen-centric service:

   > *"The Framework Program, therefore, aims to promote effective citizen participation in public and local community life, enabling them, through the use of digital tools, to access the opportunities and information necessary to exercise their rights and facilitate dialogue among social groups and different generations. Citizens, provided with the ability to use digital services offered by public administrations and local entities correctly and comprehensively, will contribute, among other things, to enhancing the effectiveness of administrative actions and the rational utilization of public resources."*

5.1.1.2. Radical change in functionality

On the other hand, regarding the dimension of functionality, the policymaker aimed to radically change it by introducing new policy instruments, encompassing radical technological and regulatory changes. The following is a list of policy instruments designed and introduced by the policymaker:

1. **Capacity-building program.** The Capacity-building program for the participating organisation is managed by DTD, assisted by the DYP. As described in the SCD Framework Program (2022), it is structured into training modules to be delivered before the start, during the execution, and after the programs for all participating organisations:
   - *Training and support for implementation prior to project commencement:* it consists of five 2-hour webinars (totalling 10 hours) for program and project coordinators and their staff. The topics covered include organisational aspects, possible strategies for optimizing projects, the DigComp framework, and methods for assessing project impact.
   - *Support during project execution:* support is provided through meetings to monitor the progress of activities, with personalized discussions on any challenges and areas for improvement based on the specific central

monitoring system. Additionally, there is an e-mail support service for addressing ongoing issues.

- *Debriefing at the conclusion of projects*: this module entails an interactive meeting (in-person or online) to discuss lessons learned, with the aim of enhancing services provided by organisations and improving the overall framework of the SCD program.

2. **Specific training of volunteers conducted by the Department and volunteers' certification of competences.** SCD volunteers receive general training and participate in scheduled program meetings provided directly by their respective organisations. In addition, they benefit from specific remote training on digital topics and active digital facilitation support delivered by the DTD in collaboration with the DYP. This specialized training equips volunteers with specific skills. Furthermore, it is essential to emphasize the value of "on-the-job" training, which takes place daily under the guidance of the OLP during volunteers' activities. This aligns with the "learning by doing" method, a fundamental aspect of the Civilian Service.

   Moreover, volunteers' skills, besides being mentioned in the specific certificate issued by the organisation, as indicated in the referenced guide, will also undergo a certification process. If organisations do not directly oversee this process, the DTD, in collaboration with the DYP, will ensure its implementation (SCD Framework Program, 2022).

   In the interview, the policymaker describes the first two new policy instruments as follows:

   > *"We've carefully considered two key aspects in our approach. Firstly, we've developed a comprehensive project model that generalizes the existing elements found in ongoing projects. Secondly, we've designed a dedicated training program, not only for the volunteers, but also for the organisations themselves to support their involvement in this new service, called "Capacity Building". Additionally, recognizing organisations' common struggles in project definition, monitoring, and governance, we've structured the experimental framework program to include both a project model and centralized training for volunteers, complementing each organization's independent efforts."*

3. **Tools for monitoring and impact assessment:** the DTD, in collaboration with the DYP, will experimentally introduce a monitoring and evaluation system for the organisations, which is based on common indicators and the completion of

specific digital questionnaires by users/beneficiaries. As part of their program participation, organisations are requested to actively engage in impact assessment activities aimed at the program's target demographic. These tasks will be conducted with experimental or quasi-experimental tools.

The SCD Framework Program (2022) provides a comprehensive overview of the monitoring and evaluation activities, as detailed below:

- Unified program monitoring through the analysis of significant indicators introduced as support for the evaluation phase. These indicators entail the systematic use by volunteers of a central data collection system, relating to the specific services of digital facilitation and education provided, as well as the user's level of learning on the addressed topics.
- Evaluation of project outcomes based on data input by organisations and volunteers into the central data collection system.
- Assessment of the program's impact on citizens' digital competences and on the skills and employability of volunteers.

4. **Increase in volunteers' reimbursement.** Starting May 1, 2023, the monthly allowance for volunteers has been increased from 444.30 euros to 507.30 euros. This increase applies to all volunteers, both those who are currently working and those who are about to begin (Decree N. 556/2023, 2023).

5. **Reopening of the Civilian Service registry and partnership with external organisations not listed in the registry.** Starting from June 21, 2023, registrations, and updates to the SCU Registry have been reopened. This registration process is designed to confirm that participating organisations meet specific criteria. Organisations can submit their applications for the Registry digitally through the Helios platform, utilizing SPID authentication.

6. **Connectivity support.** In the SCD Framework Program (2022) there is a reference to connectivity support, which encompasses measures or resources provided to enhance or ensure access and use of Internet connections or communication networks within organisations. It is worth noting that, although mentioned in the program, specific resources have not been allocated for this purpose.

7. **Regulation regarding the organisations' technological infrastructure.** The SCD Framework Program (2022) states that each point of "digital facilitation" must have appropriate logistical and technological equipment for the activities carried out, including suitable furnishings and an Internet connection with speed in line with current technological standards (minimum 30 Mbps). Each facilitation point should also provide at least one computer for volunteers, equipped with a camera, microphone, printer, and scanner, or alternatively, a multifunction printer. Additionally, for organizing seminars and courses, audio-visual equipment, video projection, and either mobile or electronic whiteboards are mandatory.

5.1.1.3. Delays in functionality change

However, concerning the functionality dimension, certain delays in delivering specific policy instruments have led to a marginal reduction in the extent of functional change's radical nature. These issues will be described using some quotes from interviews with the stakeholders involved in the SCD implementation.

- **Delays in the provision of new monitoring tools**. Many organisations experienced delays in receiving the monitoring template and found the instructions for its use unclear.

> *"Another issue is the monitoring of the services provided; we don't have clear information on this. In May, we received an email containing a downloadable template. While we appreciate the communication, there is uncertainty about the subsequent steps. Are we expected to initiate the collection of data immediately? We sense a degree of abandonment, as the overall guidance appears somewhat unclear."*
>
> (Organisation 27, SC Project Designer and Coordinator)

> *"[…] Then, we would require support for the setup of impact assessment monitoring, a crucial aspect that has been lacking thus far."*
>
> (Municipality 1, SCD project coordinator)

- **Delays in the specific training of volunteers.** The volunteers did not receive the Department's specific training within the timeframe specified.

> *"In my opinion, the real issue with training is that it probably should have been delivered at the beginning. Instead, it started a bit later. If I'm not mistaken, they underwent the training later on, I believe from September."*
>
> (Municipality 6, Responsible for coordinating volunteers)

> *"One aspect that requires improvement is addressing the delay in training offered by the Department. We noted that the individuals we selected needed training; they couldn't commence their service until they completed the training program. However, it began much later than their actual start date."*
>
> (Municipality 3, SCD project coordinator)

Hence, the innovation envisioned by the policymaker aligns with the characteristics of Design-Driven innovation, being radical in both meaning and functionality. However, the radicality of the functionality faced some challenges due to delays in the delivery and implementation of monitoring tools and specific volunteer training deliver by the Department.

5.1.2. Unintentional application of the Metamodel

In the description provided by the policymaker regarding how this radical policy innovation was designed and from the analysis of the SCD Framework Program (2022), it is possible to identify the steps of Verganti's Metamodel (2008, 2009). The Metamodel is the participatory process adopted by the designer to generate a radical innovation in product or service. This parallel between the Metamodel and the policymaker's design process will be further elucidated below, supported by quotes from both sources.

5.1.2.1. Listening to the design discourse ("Understand")

The first step is to identify and attract key interpreters, who typically know how people assign meaning to things as well as the seductive power to influence the emergence of a radical new meaning (Verganti, 2008). The policymaker described the "Understand" phase in the context of Digital Civilian Service as consisting of:

1. **Reviewing previously implemented projects with similar objectives.** The policymaker looked to projects like Punti Pane e Internet (Punti PEI), the PASS in Tuscany, and P3@ in Veneto. These initiatives began to recognize the importance of guiding citizens in the use of digital tools, despite certain limitations, such as the project's short duration and limited funding:

   > *"There were initial projects like Punti Pane e Internet, or the PASS in Tuscany and P3@ in Veneto, which started to bring forth the idea that there was a need to assist and accompany citizens. The difficulty with these projects was that they were frequently cyclical, funded by POR, and had the span of such a project cycle. As a result, after the POR project that funded them was completed, some of these were closed. In my previous experience in Rome, we established the Roma Facile points and faced the challenge of how to make the*

project cycle more structural. We also noticed that the average age of the facilitators was quite high because they were public employees."

(DTD)

2. **Involvement of key interpreters.** According to the policymaker, a "*multi-stakeholder and participatory approach*" was used to understand how to structure the new policy and what kind of radical new meaning to assign to it. The primary "key interpreters" involved in this process were:

   - Visionary organisations that had recognized the lack of digital skills as an issue and believed it was necessary to introduce initiatives aimed at reducing digital inequalities:

     "Certain visionary administrations, notably Tuscany, Emilia-Romagna, and, to a certain extent, Veneto recognize that the lack of digital skills was a problem."

     (DTD)

   - Organisations that had implemented traditional SCU projects, incorporating digital initiatives with the objective of mitigating digital inequalities:

     "The experiences we began with for generalization were those of Universal Civilian Service projects, which had digital as their theme and the reduction of the digital divide as their objective. Therefore, we systematized them thanks to the relationship with the Department of Youth Policies."

     (DTD)

   - Third-sector organisations: Informatici Senza Frontiere and Fondazione Mondo Digitale, both promote initiatives aimed at reducing digital illiteracy. Indeed, these organisations emphasize the significance of assisting those who struggle with basic skills such as reading and writing to become digitally literate. This is because, according to their perspective, functional illiteracy (difficulties understanding and using written texts) is frequently linked to digital illiteracy (a lack of skills in using digital technologies).

     "There were third-sector organisations, such as Fondazione Mondo Digitale, and Informatici senza Frontiere, which adhere to the approach of

focusing on functional illiteracy—a concept closely intertwined with digital illiteracy."

(DTD)

- Department for Youth Policies (DYP): as this policy involved third-sector organisations and SCU volunteers, the support and collaboration of the DYP was essential – although often not very cooperative –, particularly concerning the ideation and development of the necessary policy instruments for the project's implementation. Indeed, the relevance of the collaboration with DYP is highlighted in the interview with the policymaker:

  "Because the DYP was concerned that many organisations were not particularly skilled at defining projects of this type [...] together, we considered not only providing a project model by generalizing the elements already present in ongoing projects but also developing a training program for the organisations. […] In essence, the whole SCD experimental program was developed in collaboration with the DYP."

5.1.2.2. Interpreting ("Anticipate")

The DTD introduced and proposed a new meaning that was radically different from what had been believed up to that point: it was not enough to simply modify the technology to make it more accessible and easier to use, but it was essential to assist and guide people in acquiring the necessary skills to use digital tools. Furthermore, the policymaker emphasized that differences in digital technology competences are manifestations of social inequalities. Consequently, the concepts of digital inclusion and social inclusion are inextricably linked.

This new idea about the importance of developing initiatives aimed at assisting citizens, particularly those who are marginalized, in the process of acquiring digital skills, emerge clearly from the interview with the DTD:

"The issue of citizens' digital skills has been largely ignored because it was widely assumed that assisting them in using digital technology was unnecessary. The belief was that as digital technology became more pervasive and user-friendly, everything would become more intuitive and accessible. There was little emphasis placed on assisting people in the use of digital tools. "

"The issue of digital skills was not even considered, noticed, or taken into account; it appeared to be completely unrelated to everything else. [...] As a result, the prevailing idea, the constant trend among those in charge of digital and ICT policies, was that

citizens' digital skills were not important. Even today, the bonuses associated with connectivity primarily focus on access to tools, rather than on education."

Furthermore, it is critical to note that the decision to implement this policy innovation was not influenced by market demand. Rather, it was anticipated and proposed by the policymaker, who, in collaboration with key interpreters, developed a new meaning and new policy instruments. Here is a quote from the interview with the policymaker that highlights these aspects:

"However, I would like to clarify in a neutral manner that all these considerations were not driven by market demand, which means they were not requested by associations or prompted by a strong demand from volunteers. While it is true that during the pandemic, citizens start to expressed a strong need to learn how to use specific tools, particularly in sectors such as education and healthcare, this project was born from the vision of a group of innovators. These innovators felt it was necessary to develop it without a thorough market analysis or a specific demand to respond to, based on their field experience and their understanding of the historical and social context."

5.1.2.3. Addressing the design discourse ("Influence")

According to Verganti (2008), when developing Design-Driven innovation, businesses should leverage the expertise of design discourse interpreters. Interpreters have a persuasive influence because they can shape how people perceive and attribute meaning to objects. In addition, Design-Driven businesses rely on cultural prototypes to engage in design discourse. In the case of Digital Civilian Service, a manifesto for the Digital Republic was created to communicate the strategy and action plan. Within this manifesto, the policymaker proposes and communicates concrete, measurable, and effective actions aimed at improving the population's digital skills. In the interview with the policymaker, the launch of the manifesto for the Digital Republic is briefly described:

"A manifesto for the Digital Republic was launched, serving as a call to action on the front of digital skills. We continued by giving more emphasis to this theme through the Digital Republic program. However, the focus was on developing a strategy and launching the National Coalition for Digital Skills, which had originally been established in 2014 but had been completely abandoned. Therefore, we revived it and we also introduced the concept of having an operational implementation plan, a monitoring system, thus creating a structured framework that could be consistently followed."

Furthermore, for the effectiveness of the service, it is crucial that the end recipients, citizens with little or no digital skills, are placed in the best conditions for access and use. Therefore, the engagement and communication activities should be planned and implemented by the organisations involved, considering the needs of their potential users, as well as the potential and characteristics of their local community.

This also means using specific communication and channels for engaging "vulnerable" users (SCD Framework Program, 2022).

As a result of the policymaker interview analysis and evaluation of the SCD Framework Program (2022), it becomes evident that the innovation process closely aligns with the stages outlined in Verganti's Metamodel (2008, 2009). Moreover, according to Verganti (2008), because this innovation is Design-Driven and entails radical changes in functionality and meaning, it should be considered radical for all stakeholders. Consequently, I decided to empirically examine whether such alignment also exists in the context of public policy innovation.

5.2. Subsystem perspective

Since the subsystem is composed of a group of actors sharing concerns about the same policy issue, it is important to consider not only the policymaker but also the dynamics of all other stakeholders within the subsystem to assess the true magnitude of the policy change. This entailed analysing interviews with a wide range of individuals working in municipalities and organisations, which are the primary organisational stakeholder directly involved in policy implementation. The main goal is to determine whether the whole subsystem had embraced the policymaker's radical change in meaning and functionality, and thus whether the innovation was truly radical.

5.2.1. Stakeholders' alignment with the radical change in meaning

The analysis and coding of interviews with all the stakeholders belonging to the SCD subsystem, such as organisations and municipalities that implemented the policy, highlight that some of them align and convey the radical change of meaning proposed by the policymaker. Furthermore, they recognized that the SCD does not focus primarily on volunteers, but it is mainly aimed at tackling citizens' social exclusion. The program aims to accomplish this by assisting marginalized individuals in utilizing digital tools and services, enabling them to acquire the necessary digital skills.

Below are some quotes from entities that demonstrated to be aligned with the new radical meaning proposed by the policymaker*:*

> *"In my opinion, the opportunity of Digital Civilian Service is that it also addresses a significant social issue: the exclusion due to the digital divide. This affects, for example, a sizeable portion of foreign workers. So, these are new needs, but also a new sense of social intervention that, in my opinion, can provide new meanings— not just repeating the same old things but responding to new social needs and forms of political intervention in the present."*
>
> (Organisation 3, OLP)

"Digital inclusion constitutes a fundamental aspect of social inclusion, but it is important to note that it is not the sole component. Nonetheless, in certain scenarios, it is a determining component. […] Moreover, digital inclusion can serve as a prerequisite for basic access to essential services and opportunities, underlining its significance in fostering a broader spectrum of inclusion."

(Organisation 6, SC project coordinator and accredited trainer)

"In my opinion, Digital Civilian Service is truly a new frontier of what we usually call social inclusion."

(Organisation 16, Legal representative of the organisation)

Furthermore, many stakeholders recognized a shift in the SCD's target compared to the SCU. As the following quotes demonstrate, the emphasis is no longer on developing projects for the volunteers, but on designing a service for citizens.

"The Digital Civilian Service projects are intended to provide a service to citizens and have a tangible impact for the benefit of the population."

(Organisation 5, Responsible for project evaluation and monitoring)

"The primary purpose of the Digital Civilian Service is to provide a service to the community, with the secondary objective being to offer young people the opportunity to learn and gain experience."

(Organisation 22, OLP)

"There is a greater emphasis on citizen-related goals in the context of Digital Civilian Service projects. In other words, the primary goal is to improve citizens' digital literacy. In contrast, when discussing goals and outcomes in traditional Universal Civilian Service, young people are usually given more prominence."

(Municipality 4, OLP)

Conversely, others have seen the new policy as a specification of the previous one and continued to convey the meaning of Civilian Service, stemming from its sociocultural evolution, specifically as an active labour policy. According to their view, SCD is similar in its objective to SCU, with the only difference being that it further enhances the professionalization of the volunteer's service experience. Here are some examples of organisations that attributed this incremental meaning to the new policy.

"The objectives of Universal and Digital Civilian Service are essentially the same: to provide an experience that helps young people acquire skills that they can later include in their CVs and leverage in the job market. In this regard, Digital Civilian

Service is an even more professionalizing experience than traditional Civilian service."

(Organisation 18, SC project designer and monitoring expert)

"In my opinion, in Digital Civilian Service, the idea that it is a professionalizing experience is even more pronounced because, in my view, the young people who have participated in Digital Civilian Service have seen it as an opportunity to develop or acquire certain skills, which they may need to work in that sector. This underscores the program's role in not just fostering civic engagement but also actively contributing to the professional development of the individuals involved."

(Municipality 3, SCD project coordinator)

"The Digital Civilian Service is nothing more than a specification of the traditional Universal Civilian service; both are focused on providing the volunteer with an experience that allows them to acquire valuable job-market skills. [...] Furthermore, the Civilian Service retains a strong value component, and the activities proposed can be linked to the unarmed homeland defence concept in some way."

(Organisation 14, SC project coordinator)

5.2.2. Stakeholders' alignment with the radical change in functionality

The interviews were also used to assess to what extent subsystem stakeholders embraced the policymaker's radical changes along the functionality dimension. This evaluation revealed that not all stakeholders adequately adopted the new radical policy instruments. Two discernible categories emerged: one comprising those who actively implemented the new policy instruments and advocated for local-level functionality changes, and the other encompassing those who exhibited a more hesitant approach towards implementing functionality changes.

The radical changes of functionality of the first group of organisations are outlined below, providing examples and citations for clarity.

- Adequate implementation of monitoring tools:

  "Monitoring is something that the organisation must undertake, and both the OLPs and the Civilian Service volunteers are required to fill in monitoring questionnaires, one typically after six months, and another at the end. [...] If there are any negative responses, we usually follow up with a phone call, seeking to understand the issues. Additionally, we collect various data related to our services, such as the type of service they require, age, tax identification number, and whether they were able to resolve the issue for which they sought assistance."

  (Organisation 21, SC project designer)

- Local training of volunteers with a specific focus on digital aspects, sometimes collaborating with external associations for more specialized training and certification of digital skills:

  " We established connections with organisations specializing in digital skills certification and competency training to enhance our training initiatives. Additionally, we collaborated with the university on these projects. Through proactive engagement, some of our volunteer training sessions are now led by two university professors, demonstrating our commitment to fostering meaningful partnerships and enriching the learning experience."

  (Organisation 9, Responsible for the design of SC projects)

- Modification of volunteer selection criteria, favouring individuals with stronger technical and digital skills.

  "In the selection process, we prioritize evaluating volunteers' proficiency in digital skills, often requiring them to demonstrate their abilities by performing tasks in Excel or Word. [...]. Furthermore, the individuals we selected had digital skills, some of which were quite advanced. For example, some volunteers were computer science students, and one of them studied engineering."

  (Organisation 8, Accredited trainer)

- Changes in the organisation's technologies and tools:

  "Due to the introduction of Digital Civilian Service project, we have made investments in new tools and technologies. These investments are driven by our commitment to improve efficiency. For instance, we have upgraded our communication platforms to better serve our beneficiaries and stakeholders, ensuring that we stay at the forefront of digital innovation."

  (Organisation 12, SC project coordinator)

On the other hand, the organisations adopting a more incremental approach to the implementation of new policy instruments, are characterized by the following dynamics:

- Limited or lack of implementation of monitoring tools:

  "We do not monitor either the volunteers' activities or the employees' activities and we do not use any kind of monitoring tools."

  (Organisation 24, OLP)

- Not specific digital training, but the training of SCU and SCD volunteers is almost equivalent:

> *"The training of volunteers implemented by our organisation has not undergone significant changes compared to the past. Many parts of the training are conducted jointly for both ordinary and digital civilian service volunteers, with the main focus on relational and social skills."*
>
> (Organisation 6, SC project coordinator and accredited trainer)

- No modifications to the local criteria for selecting volunteers:

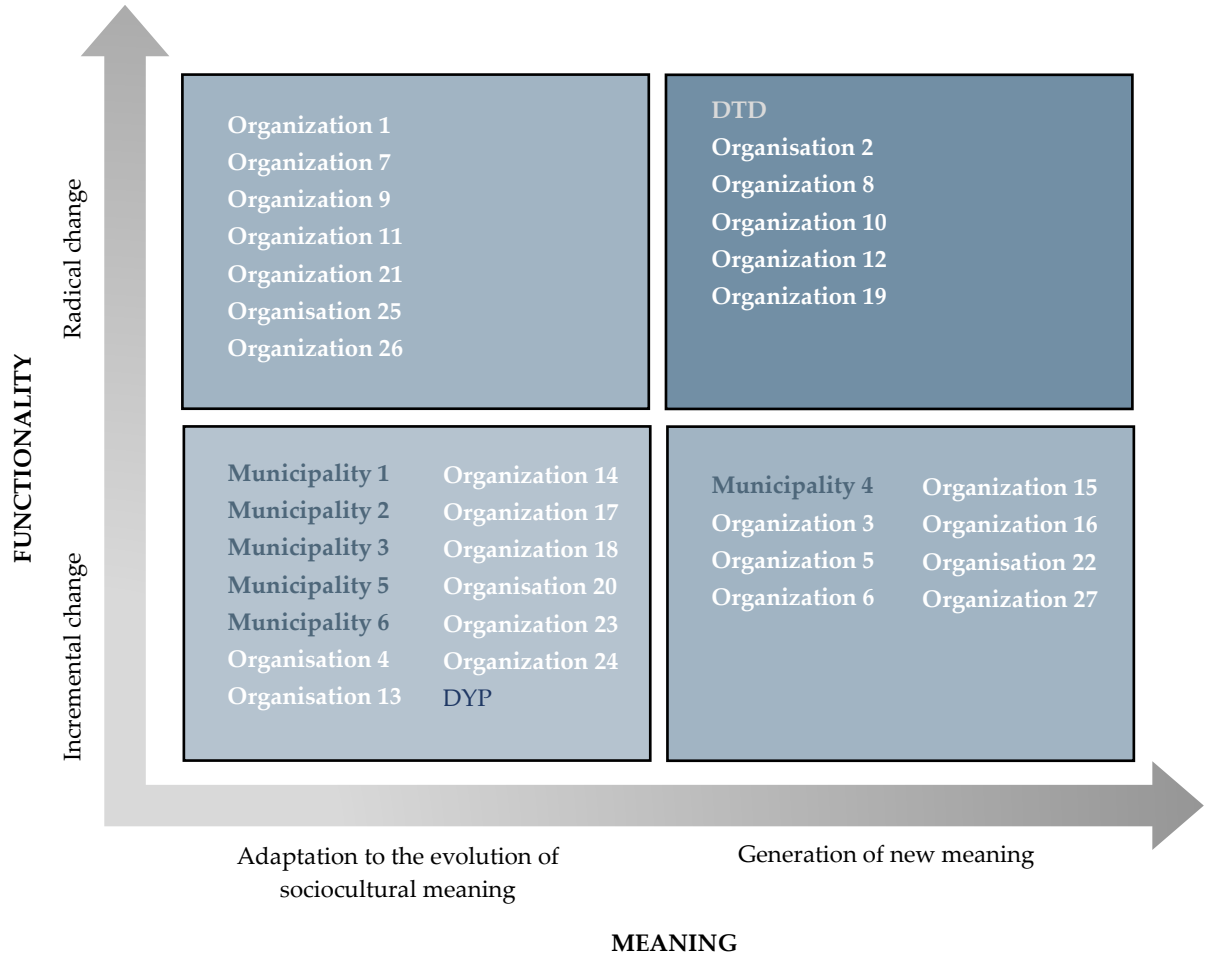
> *"The volunteers we select for Digital Civilian Service are almost identical to those of Universal Civilian Service. During the selection process, we do not pay specific attention to their computer and digital skills. What matters most is their willingness to get involved, their commitment, and their interpersonal abilities."*
>
> (Municipality 3, SCD project coordinator)

- No changes in the technologies and tools used within the organisation:

> *"In our organisation, we did not observe any changes in tools and technologies, primarily because of resource constraints. While we acknowledged the importance of adaptability, resource limitations hindered us from making substantial technology investments."*
>
> (Organisation 27, SC project designer and coordinator)

Figure 5.1 shows the alignment of subsystem stakeholders along two dimensions: meaning and functionality. As can be seen, only a small number of the subsystem's stakeholders conveyed the new radical policy meaning designed by the policymaker. Additionally, a significant number of stakeholders adopted and implemented the novel policy instruments gradually, partly influenced by delays in the delivery of these new policy tools. Furthermore, the gatekeeper DYP has been positioned in the quadrant with incremental functionality and meaning, due to its frequent lack of cooperation in the implementation of the policy, thereby hindering radical policy change.

Figure 5.1: Subsystem alignment in meaning and functionality



5.2.3. The role of stakeholders in influencing policy innovation

As shown in Figure 5.1, it is evident that not all stakeholders have fully comprehended, aligned with, and successfully implemented the radical changes designed by the policymaker. This lack of alignment highlights the inherent complexity involved in achieving radical policy change. In practice, even if the policymaker follows the Metamodel (Verganti, 2008, 2009) and designs a policy with radical changes in meaning and functionality, its final impact might not be universally radical for all stakeholders involved in the policy.

Instead, the extent of policy outcome's radicality depends on the degree to which stakeholders align with and implement the policy innovation. This observation underscores a key distinction from the realm of products and services where a designer's development of radical innovations invariably leads to an overall radical transformation for all stakeholders. In the domain of public policy, this transformation is nuanced, requiring a comprehensive analysis of all stakeholders' dynamics and characteristics within the subsystem to fully grasp the extent and process of innovation. Consequently, when applying the Design-Driven innovation theory to

public policy, additional adjustments and considerations are needed to account for the dynamics and characteristics of the subsystem.

These insights can be summarized as follows:

Proposition 1: *The Design-Driven innovation theory proposed by Verganti (2008) is incomplete when applied in the public policy domain to explain radical policy innovations.*

5.2.4. Factors influencing radical change

The preceding paragraph emphasizes the significant role of the stakeholders in the policy change process, which is also confirmed by Baumgartner & Jones (1991), but not examined in detail by them. Depending on their characteristics, stakeholders can have both a positive and negative impact on the outcome of innovation. To address PET's limitation and to determine whether there are common factors or characteristics that influence the propensity of stakeholders to change in meaning and functionality, their characteristics in each quadrant of the matrix were examined.

5.2.4.1. Factors influencing radical change in meaning

A thorough analysis of organisational stakeholders, comprising both those who comprehended and effectively conveyed the transformative meaning envisioned by the policymaker and those who did not, reveals that, in most instances, there are common shared factors within each of these two groups, as illustrated in Table 5.1.

These attributes encompass:

- **Experience in the policy domain.** This parameter indicates how many years an organization has been involved in Civilian Service policy. An experience exceeding 10 years is considered extensive, while less than 10 years is limited.
- **Network's scale.** It refers to quantity of connections within an organization's collaborative ecosystem. This network is composed of relationships and partnerships that an organization maintains with other entities for the purpose of joint initiatives, knowledge exchange, resource sharing, or other cooperative endeavours. It is considered *large* when it involves a wide range of diverse organisations, often from different geographic areas. Conversely, it is termed *small* when the network either involves just one organization (despite having several branches or locations) or a confined, local, and homogeneous set of organisations.
- **Political autonomy.** It refers to the level of independence and self-governance that an organization has in making decisions and setting its own action priorities without external interference or policymaker control. Political autonomy can vary widely, ranging from a high degree of self-determination to minimal independence, depending on the specific context and governing structures in place.

Table 5.1: Factors influencing change in meaning

Stakeholder		Experience	Political autonomy	Network's scale	
Organisations and municipalities that implemented SCD		*Does the organization have less than 10 years of experience in the SCU?* (**YES** = limited experience; **NO** = extensive experience)	*Does the organization depend on other entities to determine its action priorities?* (**YES** = low political autonomy; **NO** = high political autonomy)	*Large network of organisations*	*Single organisation or small network*
Incremental change in meaning	Organisation 1	**No**	**No**		x
	Organisation 4	**No**	**No**	**x**	
	Organisation 7	**No**	**No**	**x**	
	Organisation 9	Yes	**No**	**x**	
	Organisation 11	**No**	Yes	**x**	
	Organisation 13	**No**	**No**	**x**	
	Organisation 14	**No**	**No**	**x**	
	Organisation 17	**No**	Yes		x
	Organisation 18	**No**	Yes	**x**	
	Organisation 20	**No**	**No**	**x**	
	Organisation 21	**No**	Yes	**x**	
	Organisation 23	**No**	**No**	**x**	
	Organisation 24	**No**	**No**	**x**	
	Organisation 25	**No**	**No**	**x**	
	Organisation 26	**No**	**No**	**x**	
	Municipality 1	**No**	**No**		x
	Municipality 2	**No**	**No**		x
	Municipality 3	**No**	**No**	**x**	
	Municipality 5	**No**	**No**		x

Radical change in meaning	Organisation 2	**Yes**	**Yes**		**x**
	Organisation 3	No	**Yes**		**x**
	Organisation 5	**Yes**	**Yes**		**x**
	Organisation 6	**Yes**	No		**x**
	Organisation 8	**Yes**	No		**x**
	Organisation 10	**Yes**	**Yes**		**x**
	Organisation 12	No	**Yes**		**x**
	Organisation 15	**Yes**	**Yes**	x	
	Organisation 16	**Yes**	**Yes**		**x**
	Organisation 19	**Yes**	**Yes**		**x**
	Organisation 22	**Yes**	**Yes**	x	
	Organisation 27	**Yes**	**Yes**	x	
	Municipality 4	**Yes**	No		**x**

Therefore, as illustrated in Table 5.1, those that do not convey the new meaning, thereby mitigating the policymaker's radical shift are usually characterized by a large network, high degree of political autonomy and extensive experience in the policy domain. Conversely, organisations that align with and convey the same meaning as the policymaker exhibit opposing characteristics. They have a smaller network of organisation, less political autonomy from the policymaker's authority, and have only a few years of Civilian Service experience.

Consequently, this analysis led to the formulation of the following proposition:

Proposition 2: *The higher the level of stakeholders' political autonomy, the scale of their network, and their level of experience, the lower their propensity to implement radical changes in meaning.*

5.2.4.2. Factors influencing radical change in functionality

Analysing the organisations that have implemented the new policy instruments and regulatory changes, designed by the policymaker, in a more limited and gradual way reveals that they share a commonality of resource constraints (time, infrastructure, personnel, and financial resources).

The following quotes, extracted from interviews with stakeholders placed in the quadrant with incremental functionality, illustrate this aspect:

> *"We all lack employees, space, and resources, and it's not true that an operator is free because you still have to spend money, and we don't have enough economic resources."*
>
> (Organisation 17, SCD staff coordinator)

> *"We lacked the necessary resources, in terms of space, equipment, technology and the financial means to acquire them. Furthermore, the employees did not have time to supervise the activities of the volunteers."*
>
> (Organisation 27, SC project designer and coordinator)

> *"There is a critical issue related to the fact that we are few, and consequently, there is a lack of time and personnel to correctly implement all the tools and activities outlined in the call."*
>
> (Organisation 16, Responsible for the selection and trainer)

On the other hand, organisations that have radically implemented the new policy instruments possess ample resources, including time, infrastructure, personnel, and financial support, as illustrated by the following quotes:

> *"All the organisations we collaborated with not only had internet connectivity and access to their own devices but also possessed the economic and human resources necessary to implement the proposed changes."*
>
> (Organisation 19, SC project designer and monitoring expert)

> *"The OLP did not have an excessive workload, especially since we relieved them of administrative tasks. As a result, they had plenty of time to implement and carry out the planned activities effectively.*
>
> (Organisation 1, OLP)

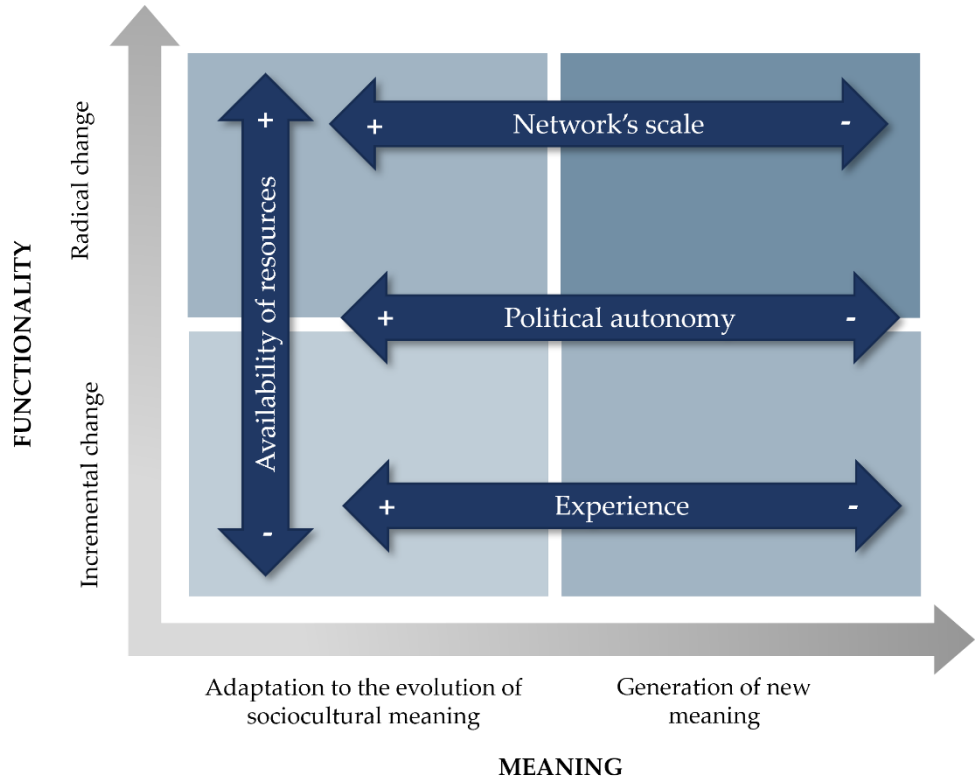
> *"For us, it was straightforward because we already had tools for monitoring activities and the infrastructure suitable for providing training to Digital Civilian Service volunteers."*
>
> (Organisation 11, Accredited trainer)

Thus, based on this empirical evidence, the following proposition can be formulated:

Proposition 3: *Insufficient resources, encompassing infrastructure, technology, time, human resources, and financial means, reduce a stakeholder's propensity to implement radical changes in functionality.*

Propositions 2 and 3 are graphically represented in Figure 5.2.

Figure 5.2: Factors influencing changes in meaning and functionality



5.2.5. Adding a new dimension: organisational dynamics

In the context of public policies, it is essential to acknowledge that policymakers do not exert direct influence on citizens but rather they reach their intended audience through a diverse array of stakeholders, primarily organisational stakeholders. Therefore, analysing stakeholders' organisational and cultural characteristics becomes extremely important to fully understand the way in which they react to policy change at organisational level. Indeed, depending on their specific organisational dynamics, they may react at the organisational level distinctively. Some may opt for radical transformations, significantly altering their processes, structures, and practices, while others may choose an incremental approach, maintaining organisational dynamics that are either similar to or slightly different from those previously in place.

However, the previously identified codes, which explain why stakeholders might struggle to convey the new radical meaning and implement proposed functionality changes effectively, do not provide an explanation for the different organisational reactions. Furthermore, the interview analysis has shed light on several aspects related to the organisational dimension, reinforcing the hypothesis that a comprehensive understanding of the innovation process necessitates consideration of this aspect.

Thus, to unravel the organisational dynamics that shape varied responses to radical policy changes, a thorough literature review was undertaken. This aimed to identify organisational and cultural attributes associated with a positive embrace of transformative change. Following this, an inductive coding process was applied to the interviews, with a focus on pinpointing the organisational and cultural characteristics of the stakeholders. Subsequently, an assessment was made to evaluate the alignment of these identified attributes with those highlighted in the existing literature.

As a result, the inductive empirical analysis reveals that, regardless of stakeholders' alignment with the radical meaning proposed by the policymaker and their implementation of new radical policy instruments, they can be categorized into two groups. The first group consists of those with organisational dynamics associated with a transformative response to change (radical), as illustrate in the existing literature. The second group comprises those with organisational dynamics that diverge from the characteristics identified in the literature, and consequently, they exhibit a passive response to change (incremental).

5.2.5.1. Transformative organisational reaction

In this section, the key organisational and cultural characteristics shared by the first group are outlined. For each characteristic, two representative quotes from the interviews are provided to elucidate their significance.

- **Empowerment of human resources:** volunteers and employees are entrusted with substantial autonomy, cultivating an environment that highly values the open expression of their ideas and creativity. This autonomy extends beyond task execution, encompassing the freedom to propose innovative ideas, lead the development of new projects, and take proactive initiatives. This active involvement and empowerment play a pivotal role in the ongoing evolution and enhancement of the organization's activities.

> *"The volunteers had the opportunity to actively participate, think and propose new initiatives, take care of the graphics, and enhance the social media channels. Furthermore, they conceived the idea of digitizing exhibitions to share culture with the local community."*
>
> (Organisation 22, OLP)

> *"Volunteers were given the opportunity to be proactive, meaning they could create, design, and develop activities they believed were most effective in addressing digital illiteracy*."
>
> (Organisation 25, SCD project coordinator)

- **Collaboration with external stakeholders:** the network and collaboration with external stakeholders of certain organisations involved in SCD experienced is substantially growing. They began collaborating and co-designing innovative projects with organisations and associations with whom they had never previously worked. In addition, they formed partnerships with universities or digital-related organisations to improve volunteer training. For instance, some more traditional and long-standing organisations collaborate with younger, digitally oriented organisations to gain positive influence and support in the innovation process. Collaborating with external stakeholders is crucial for organisations, fostering creativity, resource-sharing, and adaptability in a dynamic business landscape.

  "We have established connections with significant companies in the region that provide utility services, such as electricity, gas, and water, because it is evident that digital services also encompass the digitization of utility services."

  (Organisation 7, Responsible for coordinating volunteers)

  "The design of the Digital Civilian Service requires close collaboration with other organisations during our planning phase, prompting us to broaden our network. This expansion enabled us to form partnerships with a cohort of organisations that shared common attributes with us. As previously noted, this not only increased our opportunities but also facilitated mutual learning while working in tandem. The synergy of working together has significantly enhanced our performance, enabling us to accomplish more and foster innovation."

  (Organisation 10, SC project coordinator)

- **Experimentation culture:** the organization nurtures a culture that empowers both employees and volunteers to tackle new initiatives with a spirit of creativity and a willingness to experiment. Within this environment, the active promotion of novel ideas and innovative solutions is a common practice. Significantly, failures are not seen as setbacks but rather as valuable learning experiences, fostering a culture of ongoing improvement and adaptability.

  "We implement the Digital Civilian Service because our organisation values experimentation. As a result, anything new gives us the opportunity to experiment, which we see as an incredibly positive aspect. Experimentation, of course, occasionally entails taking the wrong path, but what truly matters is learning from our mistakes and taking action to rectify them."

  (Organisation 7, Responsible for coordinating volunteers)

"We generally place a strong emphasis on innovation, so we engage in an activity for a few years, then change because things evolve, and move on to other goals."

(Organisation 10, SC project coordinator)

- **Supportive and collaborative environment:** the organisational environment is distinguished by dynamism, mutual support, and collaboration among individuals. It encourages open communication, inclusivity, and a culture of innovation, ultimately enhancing the organization's effectiveness and employee engagement.

"We've built a friendly, positive atmosphere here. Volunteers and our staff work together smoothly, helping each other out when needed. Whenever that happens, I'm sure it boosts the quality of our service."

(Organisation 24, OLP)

"That's why our policy is not about exploiting the young people who come, but we generally strive to enable them to carry out project activities and to be adequately supported. […]. We truly feel like we are part of a team at work. […] Cooperation and mutual support are values that emerge naturally and contribute to project success."

(Organisation 9, Responsible for the design of SC projects)

- **Effective leadership:** the OLP, which can be considered as a leader, is extremely motivated and plays a key role in volunteer training, The OLP ensures that volunteers acquire essential skills and promptly extends assistance whenever needed, creating a supportive learning environment. Moreover, the OLP inspires and motivates both employees and volunteers by emphasizing the significance of change. This fosters an intense sense of purpose and urgency, compelling individuals to actively engage in the change process**.**

"Volunteers were supported not only by the appropriately trained OLP, but also by the organisation's staff. They have consistently provided their support from the beginning, contributing to the development of the new skills required for project activities."

(Organisation 9, Responsible for the design of SC project)

"OLPs demonstrate competence and motivation. They firmly endorse the SCD's proposed changes and offer vital support to volunteers when required.

Their guidance is instrumental in helping volunteers acquire new skills and become proficient in specific tasks. Moreover, they actively contribute to and facilitate the organization's overall transformation, aiding it in the digitalization process."

(Organisation 10, SC project coordinator)

The literature review, as detailed in Section 2.3.6, states that the aforementioned cultural and organisational characteristics of the organisation effectively foster radical organisational change and innovation (Table 5.2). As a result, this group of organisations is more likely to have transformative organisational reaction in response to policy innovation.

Table 5.2: Transformative organisational reaction

Empirical Variables	Variables Identified in the Literature Review	Sources
Empowerment of human resources	Autonomy and empowerment of employees	Stouten et al. (2018); Domínguez-Escrig et al. (2019); Errida et al (2021); Alqarni et al. (2022)
Collaboration with external stakeholders	Collaboration and co-creation with external stakeholders	García-Sánchez et al. (2018); Uachotikoon & Utsahajit (2019); Yong et al. (2022)
Experimentation culture	Experimental approach and risk-taking culture	Koberg et al. (2003); Uachotikoon & Utsahajit (2019); Errida & Lofti (2021); Alqarni et al. (2022)
Supportive and collaborative environment	Creating a conducive and appropriate working environment	Stouten et al. (2018); Uachotikoon & Utsahajit (2019); Errida & Lofti (2021); Alqarni et al. (2022)
Effective leadership	Visionary leadership, training and coaching of employees	Prosci (2017); Stouten et al. (2018); Uachotikoon & Utsahajit (2019); Errida & Lofti (2021); Alqarni et al. (2022)

5.2.5.2. Passive organisational reaction

The second group comprises stakeholders who exhibit the following organisational and cultural variables. To illustrate each of these characteristics, two sample quotes from the interviews are provided.

- **Low level of human resources empowerment:** within the organization, a pervasive lack of trust in volunteers has given rise to a culture of ongoing

control, rigid rules, and minimal space for the expression of employees' creativity and proactivity.

> *"Volunteers do not have the freedom to do whatever they want or to propose initiatives on their own. There are constraints and rules to follow."*
>
> (Organisation 21, SC project coordinator)

> *"We didn't give the volunteers space to reshape the activity we had outlined in the project, but they actually conformed quite closely to what was expected."*
>
> (Municipality 6, Responsible for coordinating volunteers)

- **Rigid and bureaucratic organisation:** organisations characterized by a strict adherence to formal rules, procedures, and hierarchy. In such organisations, there is an emphasis on maintaining a highly structured and centralized system of management and decision-making. As a consequence, flexibility and adaptability are often lacking.

> "*We strictly follow well-established procedures. Bureaucracy is our daily bread, and any change necessitates a lengthy and convoluted journey through our processes."*
>
> (Municipality 4, OLP)

> *"In my view, the limitation stems from centralized management. As a bureaucratic organization, we've implemented a hierarchical communication system, whereby the governing body communicates with the OLP via an intermediary. This intermediary tightly channels the flow of information from the OLP."*
>
> (Organisation 2, SCD project coordination)

- **Insufficient collaboration of external stakeholders:** lack of effective collaboration or coordination with stakeholders outside the organisation. External organisations either do not participate actively or adequately, or they are unwilling to collaborate.

> *"We also tried to involve other municipalities, asking them if they wanted to participate in the project. Regrettably, only two or three municipalities expressed interest. Consequently, considering the limited interest, organizing a project for such a small number of volunteers would not have been economically viable."*
>
> (Municipality 4, OLP)

"We have significant planning difficulties because we cannot find other entities working in the area with our characteristics." [...] We tried to involve them, but they told us they had no interest."

(Municipality 3, SCD project coordinator)

- **Lack of internal collaboration:** the organization's staff exhibits limited collaboration in the implementation of SCD projects, primarily due to a lack of a full understanding of the benefits these new initiatives offer. As a result, they may not fully support volunteers and OLPs and might display reluctance when it comes to collaborating and providing assistance in carrying out these innovative activities.

"So, the other people within the organisation are indifferent; they do not help us in realizing these new services. [...] Therefore, it is pointless to build services, to make investments, if those within do not believe in the service's validity. So, if I cannot even make my own colleagues understand that it is a useful service, how can I expect to make it clear to the outside."

(Organisation 8, Accredited trainer)

"In the organisation, there appears to be a noticeable lack of collaboration when it comes to implementing digital civilian service projects. This seems to stem from a limited understanding among the staff regarding the potential benefits and efficiency improvements associated with these new initiatives. Consequently, this lack of comprehension has led to reduced support for the volunteers involved in these projects."

(Municipality 5, SCD project coordinator)

- **Lack of effective leadership:** OLPs exhibit resistance to modifying their practices, adopting new tools, and introducing innovative activities. In their perspective, their role seems burdensome, as they often feel obligated to fulfil it. Consequently, this translates into a reduced provision of support, guidance, and motivation to volunteers and employee to embrace change.

"We have some high-profile OLPs, and it is unclear why they insist on being OLPs. These "super OLPs", as I call them, have a personal assistant who assists them and does everything they do not want to do. They see the role of OLP as a representation role, and they aren't interested in assisting volunteers or guiding them through their experiences."

(Organisation 14, SC project coordinator)

> *"In public institutions, especially within municipalities, the role of the OLP is often imposed rather than chosen. This distinction is critical because when individuals assume a role without their own volition, they may not effectively carry out the responsibilities of guiding and supporting volunteers. Moreover, they perceive these tasks related to Digital Civilian Service as a burden and provide no support for the change process in any way."*
>
> (Organisation 16, Responsible for the selection and trainer)

Organisations belonging to the second group exhibit diametrically opposed characteristics compared to the one belonging to the first group, which consequently, according to literature, hinder the process of innovation and change**.** Therefore, this group of organisations is more likely to have a passive organisational reaction in response to policy innovation (Table 5.3).

Table 5.3: Passive organisational reaction

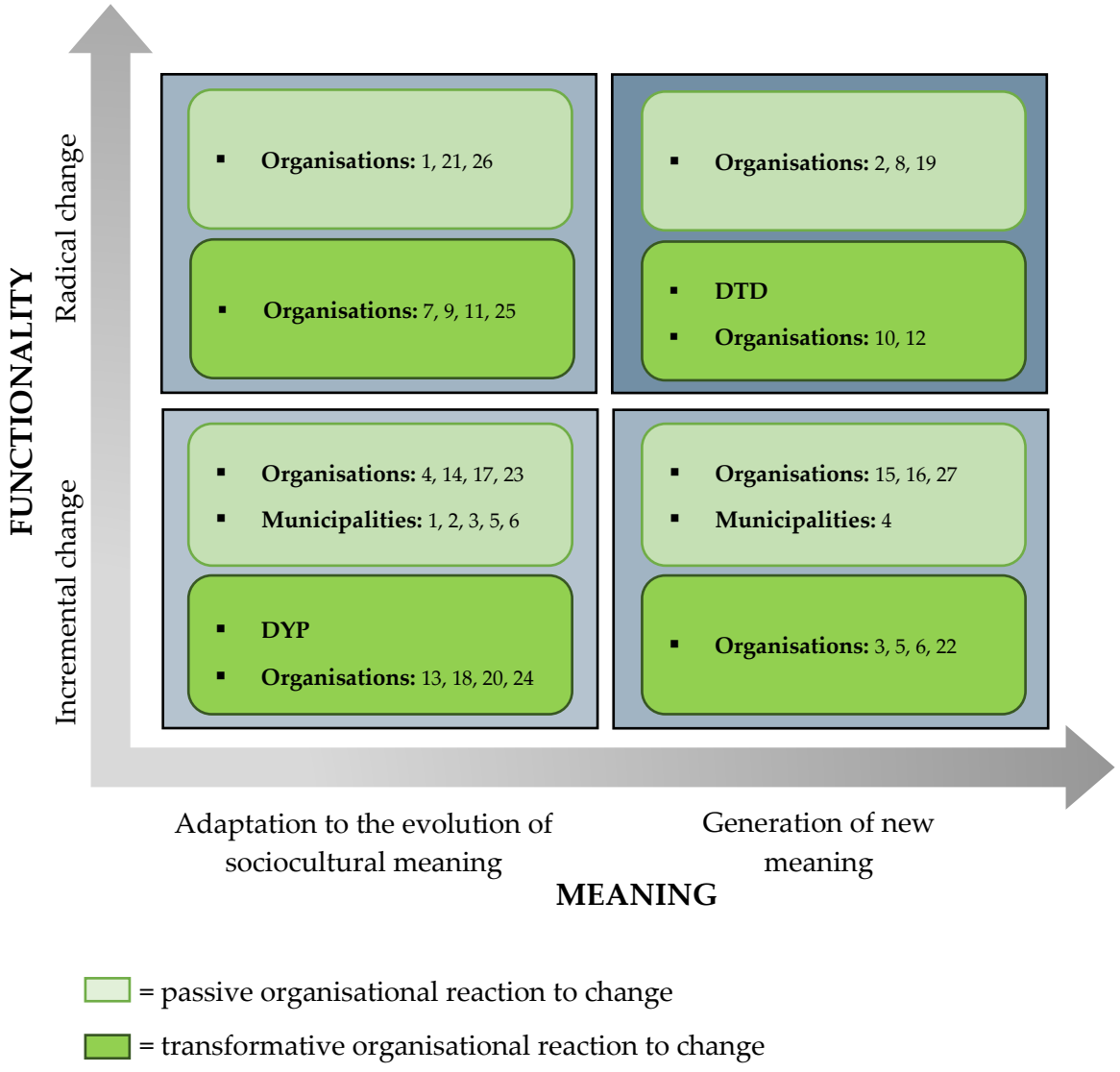
Empirical Variables	Opposing variables identified in the Literature Review	Sources
Low level of human resources empowerment	Autonomy and empowerment of employees	Stouten et al. (2018); Domínguez-Escrig et al. (2019); Errida et al (2021); Alqarni et al. (2022)
Insufficient collaboration of external stakeholders	Collaboration and co-creation with external stakeholders	García-Sánchez et al. (2018); Uachotikoon & Utsahajit (2019); Yong et al. (2022)
Rigid and bureaucratic organisations	Organic organisational structure	Stouten et al. (2018); Uachotikoon & Utsahajit (2019); Alqarni et al. (2022)
Lack of internal collaboration	Creating a conducive and appropriate working environment	Stouten et al. (2018); Uachotikoon & Utsahajit (2019); Errida & Lofti (2021); Alqarni et al. (2022)
Lack of effective leadership	Visionary leadership, training and coaching of employees	Prosci (2017); Stouten et al. (2018); Uachotikoon & Utsahajit (2019); Errida & Lofti (2021); Alqarni et al. (2022)

It is worth highlighting that, due to the lack of information regarding the organisational characteristics of the two departments, it has been assumed that the DYP, as a strongly change-averse entity, follows a passive organisational approach, while the DTD, functioning as the policymaker and embracing a highly radical policy

approach, exhibits more transformative organisational traits. Nevertheless, it is important to note that these assumptions should be subject to verification in future research.

In summary, the empirical evidence highlights the imperative of introducing a third dimension, "organisational dynamics", to complement the existing ones of meaning and functionality. This dimension encompasses the cultural and organisational characteristics of stakeholders, which shape their organisational reactions and influence the outcome of policy innovation. Figure 5.3 shows the two clusters into which organisational stakeholders can be divided based on their organisational and cultural characteristics.

Figure 5.3: Organisational dynamics



These considerations led to the formulation of the following proposition:

Proposition 4: *To fully explain policy innovation, it is necessary to consider also organisational dynamics within the subsystem. Depending on their organisational and cultural characteristics, stakeholders can have either a transformative or a passive reaction to changes.*

5.3. Propositions summary

Table 5.4 shows a summary of propositions and their main highlights.

Table 5.4: Propositions summary

Proposition	Main Highlights
Proposition 1: *Design-Driven innovation theory is incomplete when applied in the public policy domain to explain radical policy innovations.*	▪ Limits of Design-Driven innovation theory in explaining public policy innovation. ▪ Significance of the subsystem's role in shaping radical policy changes. ▪ Stakeholders' alignment with shifts in meaning and functionality is necessary for achieving radical policy innovation.
Proposition 2: *The higher the level of stakeholders' political autonomy, the scale of their network, and their level of experience, the lower their propensity to implement radical changes in meaning.*	▪ Stakeholders' characteristics influence radical policy change in meaning. ▪ Stakeholders' political autonomy, scale, and level of experience inversely affect their propensity to implement radical policy change in meaning.
Proposition 3: *Insufficient resources, encompassing infrastructure, technology, time, human resources, and financial means, reduce a stakeholder's propensity to implement radical changes in functionality.*	▪ Insufficient resources among stakeholders hinder the execution of significant policy changes in functionality. ▪ Key resources identified encompass technology infrastructure, time, personnel, and money.
Proposition 4: *To fully explain policy innovation, it is necessary to consider also organisational dynamics within the subsystem. Depending on their organisational and cultural characteristics, stakeholders can have either a transformative or a passive reaction to changes.*	▪ Incorporating an additional dimension, organisational dynamics, to achieve a comprehensive understanding of policy innovation. ▪ Identifying two stakeholder reactions to policy changes: transformative and passive. ▪ Stakeholder reactions are influenced by cultural and organisational characteristics.

6 Discussion

Building on the findings and propositions presented in Chapter 5, this section aims to understand their theoretical contributions to the existing literature as well as their policy and managerial implications, with the ultimate goal of answering the three research questions.

6.1. Theoretical contributions

This section explains the theoretical contributions derived from the empirical evidence and propositions detailed in the previous chapter, providing additional insight into the existing literature.

6.1.1. Theoretical contribution of Proposition 1

Verganti's Design-Driven theory (2008) can be extended into the public policy domain. In this context, the notion of *meaning* can be translated using the term *policy image*, referring to the vision, approach, and language associated with a policy, as proposed by Baumgartner & Jones (1991). Similarly, *technology* can be redefined as *policy instruments* that policymakers designed to promote and steer policy change (Howlett, 2005). As in the domain of products and services, where Design-Driven innovation depends on a radical redefinition of meaning, often accompanied by changes of functionality, innovation within public policies unfolds through substantial shifts in policy image, as described in PET, typically accompanied by changes in policy instruments.

However, unlike product and service innovation, where stakeholders comprehend and convey the radical changes proposed by designers, empirical analyses of public policies reveal a distinctive pattern of stakeholder behaviour. Despite policymakers' persistent efforts to promote a substantial shift in meaning, often accompanied by radical change in policy instruments, following a process similar to the Metamodel (Verganti, 2008, 2009), the resulting innovation does not uniformly lead to a completely radical transformation for all stakeholders. This divergence stems from the diverse ways in which different actors engage with and execute policy innovation. Some stakeholders embrace it more radically, aligning with the policymaker's intended changes in meaning, technology, or both, while others adopt a more incremental approach. This underscores the necessity for modifications to the Design-

Driven innovation theory when employed to explain public policy innovation. These adaptations should introduce the analysis of the whole subsystem and the role of stakeholders in influencing the process of change.

The relevance of the subsystem in the realm of public policies has also been highlighted by Baumgartner & Jones (1991). They emphasized its pivotal role in shaping periods of stability by preserving and defending the prevailing policy image, as well as in catalysing moments of dramatic change by actively contesting and opposing the existing policy image. However, despite PET recognizes the subsystem's relevant role in the process of change, it does not explore the intricate characteristics and micro-level factors within the subsystem that can either facilitate or hinder the innovation process. Indeed, the authors themselves suggest that their theory is better suited for making predictions at a broad, system-level perspective to comprehend trends and patterns in policy shifts over time (True et al., 2006).

Hence, within the realm of public policy, the subsystem, encompassing both policymakers and stakeholders, assumes a vital role in shaping policy outcomes. While policymakers are the designers of a policy, stakeholders wield greater influence and power in influencing the extent of change generated by the policy. This is due to the pivotal role that stakeholders play in not only conceiving but also executing public policies, with policymakers frequently reliant on their support and cooperation for the successful implementation. In essence, stakeholders can either convey or hinder the radical policy meaning crafted by the policymaker, and they can choose to either implement or resist the newly designed policy instruments. Therefore, the symbiotic relationship between policymakers and stakeholders within the subsystem is instrumental in defining the direction and outcome of policy innovations.

The significance of stakeholders in public policy has also been emphasized by Tsoukiàs et al. (2013), who stress the importance of considering and involving a diverse range of stakeholders in the policy-making process, each with their distinct objectives, expectations, resources, and concerns. According to Tsoukiàs et al. (2013), it is also important to address the differing "languages" spoken by these stakeholders, their unique perceptions of the policy cycle, and the diverse expectations they hold. Indeed, all these factors are interrelated and can exert a significant influence on the ultimate outcome of the policy. Moreover, policymakers aim to achieve legitimation during the process of making and executing policies (Tsoukiàs et al., 2013). Legitimation, which is essentially about making policy actions, the outcomes, and the entire policymaking process justifiable and acceptable to the wider public, depends on the active involvement of stakeholders. To attain this legitimacy, policymakers must embrace the participation of stakeholders, thereby ensuring that a diverse array of voices and perspectives are heard and considered. Their active involvement fosters transparency, enabling them to witness how decisions are made and what factors influence them. This highlights the central role of stakeholders in influencing and legitimizing policy changes. Consequently, when stakeholders do not align with

proposed policy changes, it can lead to resistance, non-compliance, or challenges in policy implementation. These, in turn, hinder subsequent stages of the policy cycle and diminish the potential for radical policy innovation.

In contrast, in the domain of products and services, where the Design-Driven theory was developed, organisational stakeholders, which are the central focus of this study, have a less influential role in determining the trajectory of innovation. They are typically represented by organisation such as retailers, distributors, brokers or wholesaler and other intermediaries within the product and service supply chain. Their primary function focuses on the retailing, distribution, and marketing of innovations (Engez & Aarikka-Stenroos, 2023), rather than actively participating in the design phase of these innovations. They predominantly serve as conduits for introducing new products or services to the market, acting as intermediaries between manufacturers and consumers.

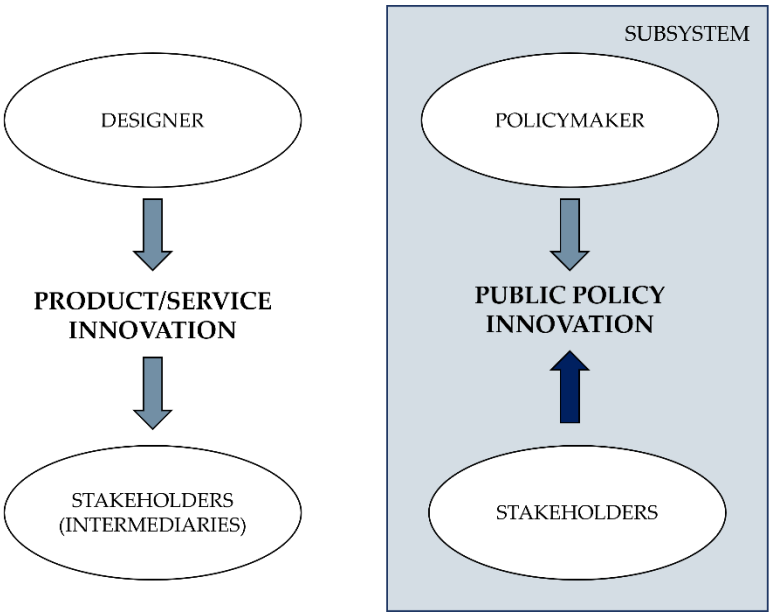
In the literature, intermediaries are described has having two primary functions (Shin, 2012). Firstly, they facilitate matching of buyers and sellers. This means they make it easier for people who want to buy something to find people who want to sell it, creating a smoother marketplace. Secondly, intermediaries address adverse selection by ensuring the quality of products exchanged, acting as quality guarantors (Shin, 2012). This quality assurance builds trust between buyers and sellers, reducing the risk of receiving low-quality goods. Regardless of their specific function, intermediaries are consistently defined as entities that establish crucial links between companies and external sources or recipients of innovation. In this capacity, they play a central role in not only facilitating but also mediating relationships with these actors (Nambisan et al., 2012).

In recent times, new collaborative and distributed innovation models, such as the open innovation paradigm, are gaining prominence. Open innovation can be defined as "*the use of purposive inflows and outflows of knowledge to accelerate internal innovation, and expand the markets for external use of innovation, respectively*" (Chesbrough et al., 2006, p. 1). This paradigm involves actively seeking and incorporating external sources of ideas, technologies, and resources. It contrasts with traditional closed or internal innovation models by recognizing the value of external contributions from sources such as other companies, research institutions, startups, and customers. The widespread adoption of this paradigm is causing a significant shift. It empowers intermediaries, traditionally associated with various functions along the value chain, to play an active role in the innovation process. These intermediaries facilitate the identification and access to external knowledge, marking a departure from their conventional roles (Lopez & Vanhaverbekea, 2009).

In summary, in the context of products and services, the Design-Driven innovation process can be described as unidirectional, primarily driven by the designer, with organisational stakeholders essentially experiencing the innovation passively. They

essentially act as intermediaries, with little to no influence on the radicalness of the innovation. In contrast, in the realm of public policies, the process is bidirectional; stakeholders actively influence the implementation and interpretation of innovations, and they can reduce their radical nature. This concept is illustrated in Figure 6.1.

Figure 6.1: Stakeholders' role in public policy innovation



Since Verganti's Design-Driven theory (2008) was developed in a context where stakeholders have a less influential role in determining the outcome of innovation, it is crucial to enhance and broaden the theory to make it applicable to public policy domain. Specifically, there is a need to delve more deeply into the subsystem and its role in influencing innovation. This entails a comprehensive examination of the dynamics and characteristics of both stakeholders and policymakers, which can significantly impact the policy change process.

6.1.2. Theoretical Contribution of Proposition 2 and 3

Proposition 1, in conjunction with PET, underscores the significance of performing a comprehensive analysis of the subsystem factors that can influence the outcome of a radical policy innovation. The empirical examination of stakeholders' alignment with the change proposed by the policymaker, particularly concerning shifts in meaning, has unveiled three critical factors:

- **Experience in the policy domain.** Stakeholders with extensive experience in a specific policy domain have deep knowledge and understanding of its dynamics. However, this experience can also encourage resistance to change

due to stakeholders' adherence to traditional practices and values that may not align with the policymaker's fresh innovations.

In contrast, stakeholders with little experience in a particular policy domain may find it relatively easier to adapt to policymaker's changes of meaning. First, since they have limited prior experience, they may not have established preconceived notions, values, or habits regarding the policy, making them more open to new ideas and interpretations. Additionally, individuals or organisations with less experience in a particular policy domain may be more eager to learn and adapt. They may recognize that they have much to gain from understanding and aligning with the evolving policy, leading to a more proactive approach to change. Lastly, they may not have well-established institutional structures, cultures, or practices related to that policy, which reduces their inertia to policy meaning change.

- **Scale of the network.** It refers to how extensive the collaborative network of an organisation is in terms of the number of individuals, entities, or components it includes. In large-scale networks, there are often organisations with a huge network of stakeholders, usually with diverse interests, goals, and perspectives. Coordinating and aligning all these stakeholders toward a radical change in meaning can be challenging due to the complexity of managing such a diverse group. Moreover, larger networks often come with more bureaucratic structures and hierarchical decision-making processes. This can slow down the decision-making and the implementation of radical changes, as they may require approval from multiple layers of management. Additionally, in a larger network, stakeholders may have a wider range of interests and priorities. Some may benefit from the current status quo and resist changes that could potentially disrupt their interests. Lastly, communicating a radical change in meaning across a large network can be challenging and miscommunication or a lack of clarity can lead to misunderstandings and resistance among stakeholders.

  On the other hand, small-scale networks are more easily aligned with the policymaker's changes in meaning. The first reason is that communication channels in smaller networks are more direct and less convoluted. This facilitates information dissemination and understanding of the proposed changes, reducing the possibility of misinterpretation or confusion. Additionally, smaller networks generally feature fewer decision-making hierarchies, involve fewer individuals, and present lower bureaucratic obstacles. This agility enables faster decision-making and policy-meaning change implementation, reducing resistance and inertia. Furthermore, they usually have more homogeneous goals or interests, making it easier to find common ground and align around the policymaker's proposed changes, particularly if those changes align with their existing objectives.

- **Political autonomy from the policymaker.** It refers to the level of independence and decision-making authority that a stakeholder has in making decisions and setting its own action priorities without external interference or policymaker's control. Stakeholders with high degree of political autonomy from policymakers have a significant degree of independence and control over their own decisions and actions, especially in matters related to their specific domain or organisation. They are less influenced or directed by the policymaker's decisions and can set their own objectives, priorities, and agenda. These stakeholders prioritize preserving their independence and accepting the policymaker's new meaning may be viewed as a potential threat to their autonomy. Furthermore, these stakeholders may have objectives and agendas that differ from those of the policymaker. Consequently, they tend to resist changes that they interpret as detrimental to their own goals and values or as potential obstacles. In addition, organisations with a high degree of autonomy frequently cultivate an internal culture that is resistant to outside influences. Therefore, when they have to implement a radical new policy, they may experience inertia. Finally, stakeholders with a high degree of autonomy may be sceptical of policymakers, particularly if prior disagreements exist or policy changes are perceived as abrupt and poorly communicated.

  Conversely, stakeholders with a low degree of political autonomy from policymakers have limited independence and decision-making authority. They are more closely tied to the directives and decisions made by policymaker, and their actions are often aligned with the objectives set by the policymakers. Therefore, they are more inclined to support and communicate the new policy meaning for two main reasons. First, due to their limited autonomy, they are closely bound to policymakers' directives, making it imperative for them to align with new policies to ensure their success. Furthermore, they may share congruent objectives and values with the policymaker. Thus, adopting the new policy meaning and aligning with the policy innovation designed by the policymaker can be seen as a strategically advantageous approach to achieve these shared goals.

Moreover, through the analysis of factors determining the implementation and execution of radical technological and regulatory changes designed by the policymaker, it becomes evident how the availability of resources among stakeholders is a critical factor in determining the effective and radical implementation of new policy instruments.

Four fundamental resources have emerged from the empirical analysis as relevant in influencing radical policy changes along the functionality dimension:

- **Financial resources.** They serve as the foundation for implementing technological and regulatory changes. Access to sufficient funding is required

to cover the costs associated with the adoption of new technologies or compliance with the updated regulations. These expenses can include the purchase of new equipment or software, the hiring of experts, employee training, and a variety of other expenses. Stakeholders with ready access to financial resources are better equipped to manage these costs efficiently, ensuring a smooth and successful transition.

- **Human resources.** The effectiveness of implementing functionality changes hinges on the quality and quantity of human resources available. Competent personnel are the bedrock of successful transformations, as they possess the expertise to comprehend the intricacies of regulatory compliance and technological advancements. Their capacity to swiftly adapt to evolving requirements and to demonstrate exceptional problem-solving skills is indispensable for surmounting unexpected obstacles and ensuring the smooth execution of complex initiatives. In addition to competence, the availability of an adequate workforce is equally vital, particularly in the context of extensive functionality changes. Large-scale transformations often demand a substantial workforce to oversee every facet of the process, encompassing planning, design, implementation, and ongoing management. Therefore, the availability of a sufficient number of skilled workers is paramount in facilitating the efficient progression of the implementation, effectively preventing bottlenecks, and ensuring a seamless process.
- **Infrastructure and technologies.** The presence and quality of infrastructure and technologies are crucial factors in facilitating a seamless and effective transition to the adoption of new policy instruments. Organisations equipped with robust infrastructure and advanced technologies are not only well-prepared to adapt to changes but also possess a competitive edge in embracing and implementing new designed policy tools. For instance, considering the SCD, activities such as monitoring, volunteer training, and capacity building are significantly more manageable when organisations have prior access to technological resources. High-speed and reliable internet connectivity, well-furnished and technology-equipped workspaces, and the availability of necessary information devices greatly expedite the process. Moreover, these resources enhance the quality of initiatives, enabling organisations to proactively respond to the demands of the rapidly changing policy landscape.
- **Time.** Time is a fundamental resource in the implementation of significant changes. Organisations and individuals must have the necessary time to plan, execute, and adapt to changes. However, a lack of time, often due to excessive workloads or overlapping tasks, can hinder the implementation of functionality changes, leading organisations to perceive them as a waste of time. Consequently, they often continue to operate without applying or only partially

implementing the new technological and regulatory changes designed by the policymaker.

It is critical to emphasize that the availability of these resources is not the sole determinant of policy innovation success; rather, it facilitates the effective implementation of radical innovation in functionality, whereas their scarcity can impede the functionality innovation process. Furthermore, the literature review on characteristics that positively influence change confirms the importance of resource availability as a success factor for change (Stouten, 2018; Errida & Lofti, 2021; Alqaurni et al., 2022).

In conclusion, propositions 2 and 3 offer an additional theoretical contribution by identifying factors within the subsystem that either impede or facilitate stakeholders' implementation of the radical change designed by the policymaker along the two dimensions of meaning and functionality.

6.1.3. Theoretical Contribution of Proposition 4

Moving forward to Proposition 4, the analysis of the interviews, coupled with a literature review on the organisational and cultural characteristics affecting innovation, has shed light on the substantial impact of stakeholders' organisational dynamics in influencing policy innovation. As the stakeholders being examined are organisations, the literature indicates that their organisational and cultural characteristics can result in two distinct reactions to policy innovation: transformative and passive.

In the case of a transformative organisational reaction, organisations actively embrace change and seek to transform their practices, processes, and structures to adapt to new conditions or emerging challenges. They are open to new ideas and invest resources proactively to drive change. This approach is forward-thinking, with a focus on continuous adaptation and improvement. In contrast, in a passive organisational reaction, organisations resist change or simply aim to adapt without making significant changes to their organisation. They may be hesitant to change their traditional practices and processes, preferring to maintain the status quo or react only when necessary.

Therefore, when a radical innovation is proposed by a policymaker, organisations with a transformative reaction tend to make profound internal changes to facilitate a highly innovative outcome. On the other hand, those who have a passive reaction, even if they align with the change in meaning and functionality, tend to hesitate or implement organisational changes incrementally, limiting the extent of radical innovation. This explains why it is essential to modify Verganti's model (2008), which traditionally considers only changes along the dimensions of meaning and functionality, by introducing a third dimension called "organisational dynamics". Indeed, when dealing with organisational stakeholders, this dimension becomes crucial in understanding

the outcome of radical innovation. Like the other two dimensions, this one can also exhibit two stages: a radical stage, corresponding to the transformative organisational reaction, and an incremental stage, associated with the passive organisational reaction.

Figure 6.1 provides a concise overview of the variables resulting from the empirical analysis, which have been substantiated by existing literature as integral to organisations manifesting a transformative response to policy innovation. These variables encompass: human resources empowerment, collaboration with external stakeholders, experimentation culture, supportive and collaborative environment, and effective leadership. These factors contribute to creating a dynamic, agile, and innovation-prone environment that promotes innovation and facilitates the successful implementation of transformative policies.

For each of these variables mentioned above, this table includes a succinct description, and references to scholarly papers where these variables have been identified.

Table 6.1: Factors influencing transformative reaction

Empirical variables	Description	Literature review	Sources
Human resources empowerment	Human resource empowerment fosters a culture that encourages and supports innovation. It empowers employees to take ownership of their work, make decisions, and actively contribute to the organization's success. This increased engagement, creativity, and adaptability among empowered employees create an environment where innovation can thrive.	Autonomy and empowerment of employees	Stouten et al. (2018); Domínguez-Escrig et al. (2019); Errida et al (2021); Alqarni et al. (2022)
Collaboration with external stakeholders	Collaborating with previously uninvolved external partners can spark fresh perspectives and innovative ideas within organisations. This factor encourages organisations to broaden their network and engage with diverse stakeholders, fostering an environment where new ideas, expertise, and resources are introduced and valued.	Collaboration and co-creation with external stakeholders	García-Sánchez et al. (2018); Uachotikoon & Utsahajit (2019); Yong et al. (2022)

Experimentation culture	The organisation promotes an innovation culture that encourages employees to embrace experimentation as a key component of their project development methodology. Workers are free to experiment with novel ideas and technologies without worrying about failing. The emphasis is on drawing lessons from the experiments and applying the knowledge gained to guide improvements.	Experimental approach and risk-taking culture	Koberg et al. (2003); Uachotikoon & Utsahajit (2019); Errida & Lofti (2021); Alqarni et al. (2022)
Supportive and collaborative environment	The organisational environment is distinguished by dynamism, mutual support, and collaboration among individuals. This atmosphere fosters open communication, encourages the sharing of ideas, and promotes a collective commitment to achieving common goals.	Creating a conducive and appropriate working environment	Stouten et al. (2018); Uachotikoon & Utsahajit (2019); Errida & Lofti (2021); Alqarni et al. (2022)
Effective leadership	It involves strong and inspiring guidance provided by leaders that encourage members of the organisation to think innovatively and adopt new practices. Effective leaders set clear goals, promote a culture of innovation, and provide the necessary resources and support to employees. Leaders can inspire their teams to think innovatively and adopt new practices, ultimately driving the organization's innovative success.	Visionary leadership, training and coaching of employees	Prosci (2017); Stouten et al. (2018); Uachotikoon & Utsahajit (2019); Errida & Lofti (2021); Alqarni et al. (2022)

6.1.3.1. Passive organisational reaction

Table 6.2 provides an overview of variables arising from empirical analysis that stand in contrast to those established in the literature as linked to a transformative response to policy innovation. These variables encompass: low level of human resources empowerment, rigid and bureaucratic organisation, insufficient collaboration of external stakeholders, lack of internal collaboration, and lack of effective leadership. Organisations demonstrating these characteristics tend to be static, inflexible, resistant to change and innovation, which is why they exhibit a passive organisational response to policy innovation.

For each of these variables mentioned above, this table provides a brief description and references to the papers where these opposite variables have been documented.

Table 6.2: Factors influencing passive reaction

Empirical variables	Description	Literature review	Sources
Low level of human resources empowerment	Employees are granted limited autonomy and trust, resulting in constant monitoring and minimal opportunities for them to unleash their creativity and proactivity. This can be a significant barrier to policy innovation.	Autonomy and empowerment of employees	Stouten et al. (2018); Domínguez-Escrig et al. (2019); Errida et al (2021); Alqarni et al. (2022)
Rigid and bureaucratic organisation	The processes are slow and overly rigid, and the organisation lacks flexibility and adaptability to change.	Organic organisational structure	Stouten et al. (2018); Uachotikoon & Utsahajit (2019); Alqarni et al. (2022)
Insufficient collaboration of external stakeholders	Lack of effective collaboration or coordination with stakeholders outside the organisation. External organisations either do not participate actively or adequately, or they are unwilling to collaborate. This can slow down the innovation process.	Collaboration and co-creation with external stakeholders	García-Sánchez et al. (2018); Uachotikoon & Utsahajit (2019); Yong et al. (2022)
Lack of internal collaboration	Individuals or groups within an organisation fail to actively work together and share resources, knowledge, or efforts. This results in limited or no cooperation, coordination, or synergy among team members or departments. This can lead to inefficiencies, missed opportunities, and slower progress in the innovation process.	Creating a conducive and appropriate working environment	Stouten et al. (2018); Uachotikoon & Utsahajit (2019); Errida & Lofti (2021); Alqarni et al. (2022)
Lack of effective leadership	Leadership is ineffective or lacking. This can result in a lack of direction, unclear goals, and a failure to inspire and guide teams toward innovative thinking and practices.	Visionary leadership, training and coaching of employees	Prosci (2017); Stouten et al. (2018); Uachotikoon & Utsahajit (2019); Errida & Lofti (2021); Alqarni et al. (2022)

6.2. Comprehensive Framework

The previously reported theoretical contributions have led to the development of a comprehensive framework that explains the process of Design-Driven radical innovation in the context of public policy. This framework was developed by initially applying and adapting the principles of Design-Driven theory (Verganti, 2008) to the realm of policies and subsequently expanding it to encompass not only meaning and functionality but also the organisational dynamics of the subsystem.

Furthermore, it should be noted that this model is meant to be applied to a subsystem (stakeholders and policymaker), which, as highlighted by Baumgartner & Jones (1991) and by the empirical evidence plays a significant role in determining the outcome of innovation. Indeed, the stakeholders of a subsystem may or may not align with the radical change proposed by the policymaker, influencing the extent of the policy innovation. As a result, this framework, which is further explained in the following paragraphs, enables a better comprehension of the outcome of the policymaker's Design-Driven radical innovation proposal, contingent upon the attributes of the subsystem stakeholders.

6.2.1. Three dimensions of change

The model comprises three axes, each representing a distinct dimension along which a subsystem can change. These axes are further subdivided into two stages, depending on whether the change is incremental or radical. These dimensions are further detailed below and visually depicted in Figure 6.2**.**

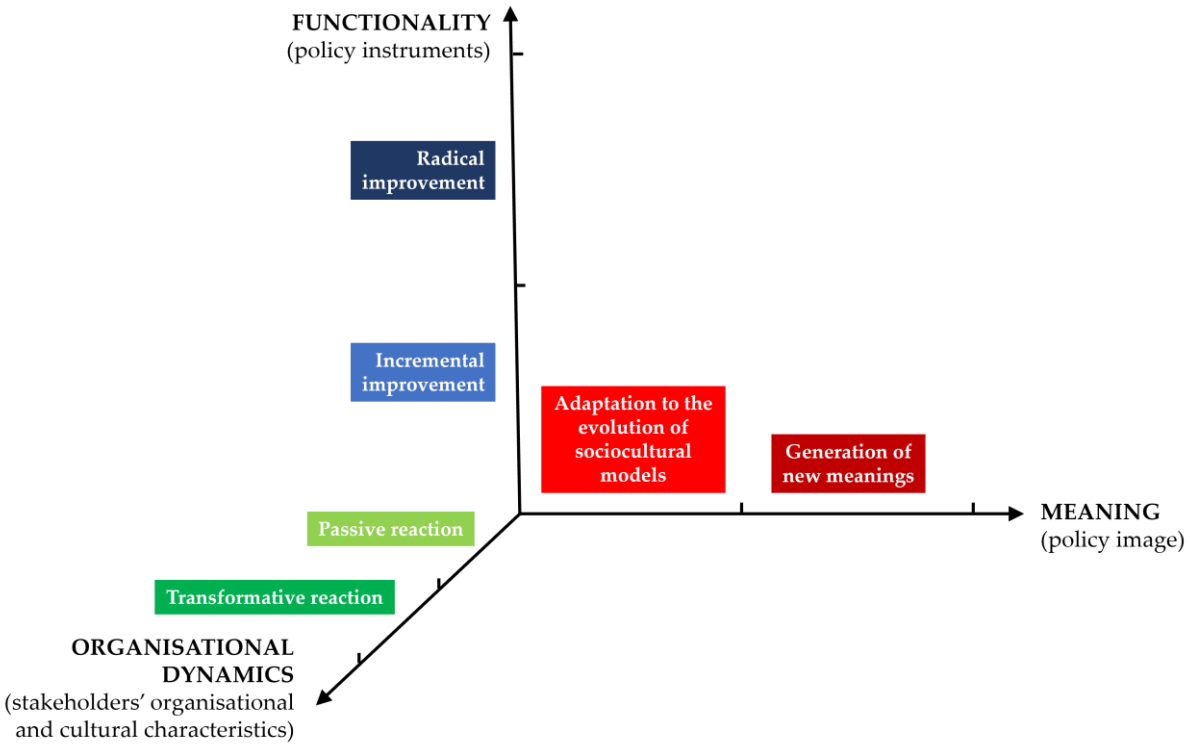
- **Meaning:** vision, approach, and language attributed to the policy by policymakers and understood and conveyed by stakeholders. It corresponds to the concept of policy image as defined by Baumgartner & Jones (1991).
  - *Adaptation to the evolution of the sociocultural model:* incremental change of meaning, which aligned with the evolution of sociocultural context.
  - *Generation of new meaning:* radical change of meaning compared to the previous policy.

  The change in meaning serves as the cornerstone for achieving radical Design-Driven innovation in products and services (Verganti, 2008). Additionally, according to PET, a radical change along this dimension also acts as the driving force behind policy change (Baumgartner & Jones, 1991). Consequently, ensuring stakeholder alignment with the meaning change envisioned by policymakers emerges as the most pivotal element to achieve a radical Design-Driven policy innovation.

- **Functionality**: policy instruments, primarily encompassing technological and regulatory changes, designed by the policymakers, and implemented by the stakeholders of the subsystem.
  - *Incremental improvement:* policy instruments change gradually compared to the previous policy.
  - *Radical improvement:* policy instruments change significantly from the previous policy.

- **Organisational dynamics**: stakeholders' organisational and cultural characteristics.
  - *Transformative reaction*: the stakeholder has organisational and cultural characteristics that predispose it to radical organisational change.
  - *Passive reaction*: the stakeholder has organisational and cultural characteristics that make it passive and inclined toward incremental organisational change.

Figure 6.2: Three dimensions of change



The intersection of these three axes, combined with the theoretical contributions offered by the four propositions, enables the creation of a three-dimensional model, as depicted in Figure 6.3. This model elucidates the key factors influencing organisational

alignment along the axes of meaning and functionality. The third dimension, on the other hand, is contingent upon various cultural and organisational attributes, which impact the propensity toward organisational change, as shown in Figure 6.4.

Figure 6.3: Comprehensive framework

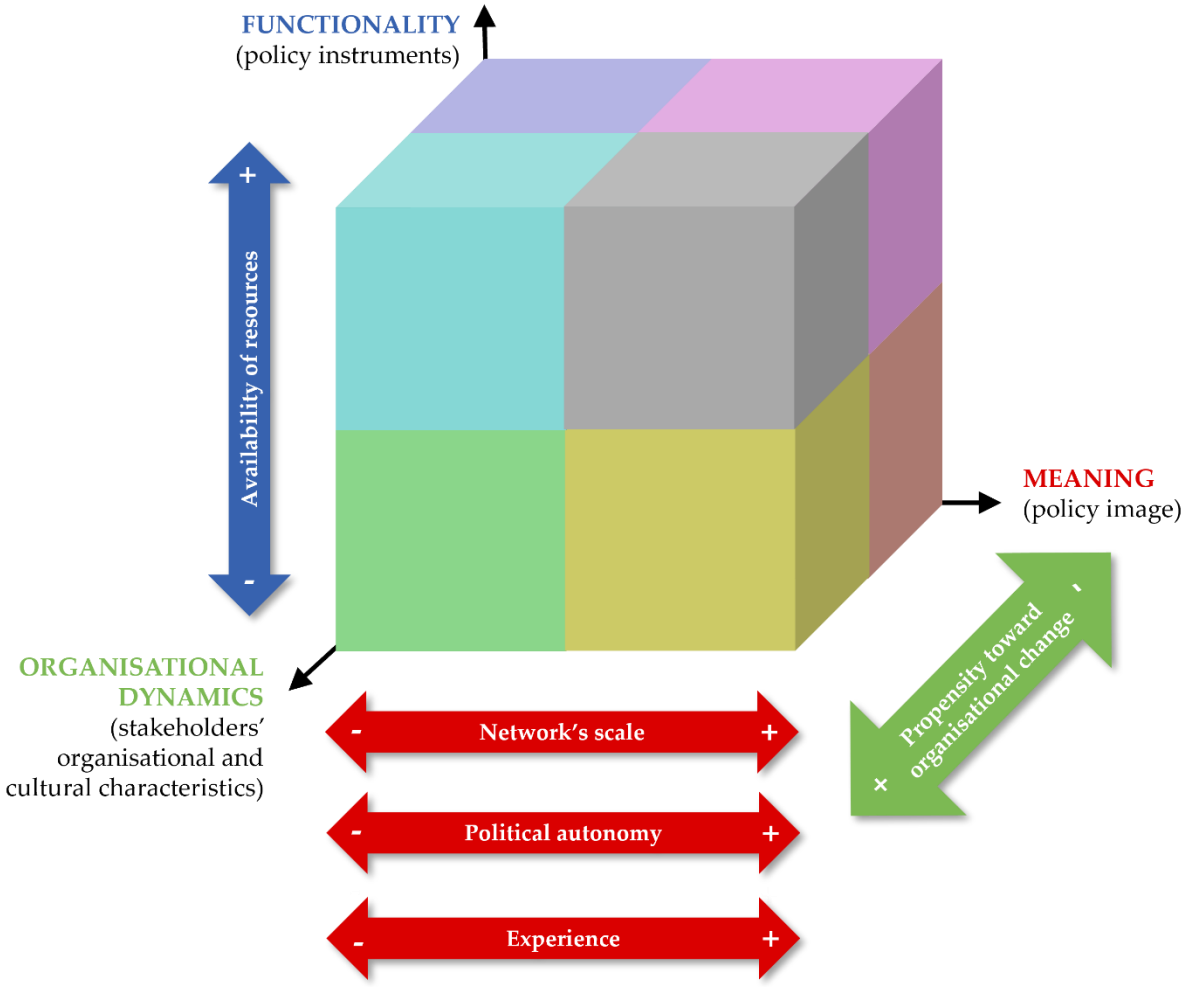
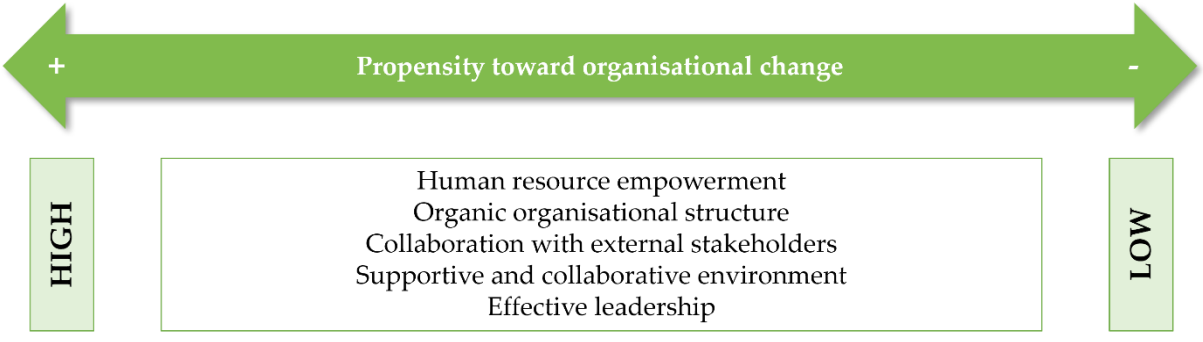


Figure 6.4: Propensity toward organisational change



6.2.2. Types of innovation

This comprehensive three-dimensional framework is designed to illustrate the diverse tensions that arise within the subsystem when a policymaker aims to implement a radical Design-Driven innovation. It is crucial to acknowledge that not all subsystem's stakeholders readily align with the policymaker's proposed radical shifts in meaning and functionality. Indeed, certain stakeholders may introduce counteracting tensions along the three dimensions of change: meaning, functionality, and organisational dynamics. Consequently, each stakeholder, based on his unique characteristics and dynamics, tends to influence the innovation's trajectory in a different direction.

The intersection of the three axes, further subdivided into two stages each, whether incremental or radical, generates eight distinct scenarios. Each of these scenarios corresponds to a different type of innovation resulting from the policymaker's radical Design-Driven innovation (as illustrated in Figure 6.5 and Figure 6.6). Moreover, the empirical analysis has facilitated the identification of stakeholder characteristics and factors that determine various types of innovation, serving as underlying drivers of tensions either in favor of or against radical change. A comprehensive description of each scenario, contingent upon stakeholder characteristics, is provided in the subsequent sections.

Figure 6.5: Types of innovation (transformative reaction)

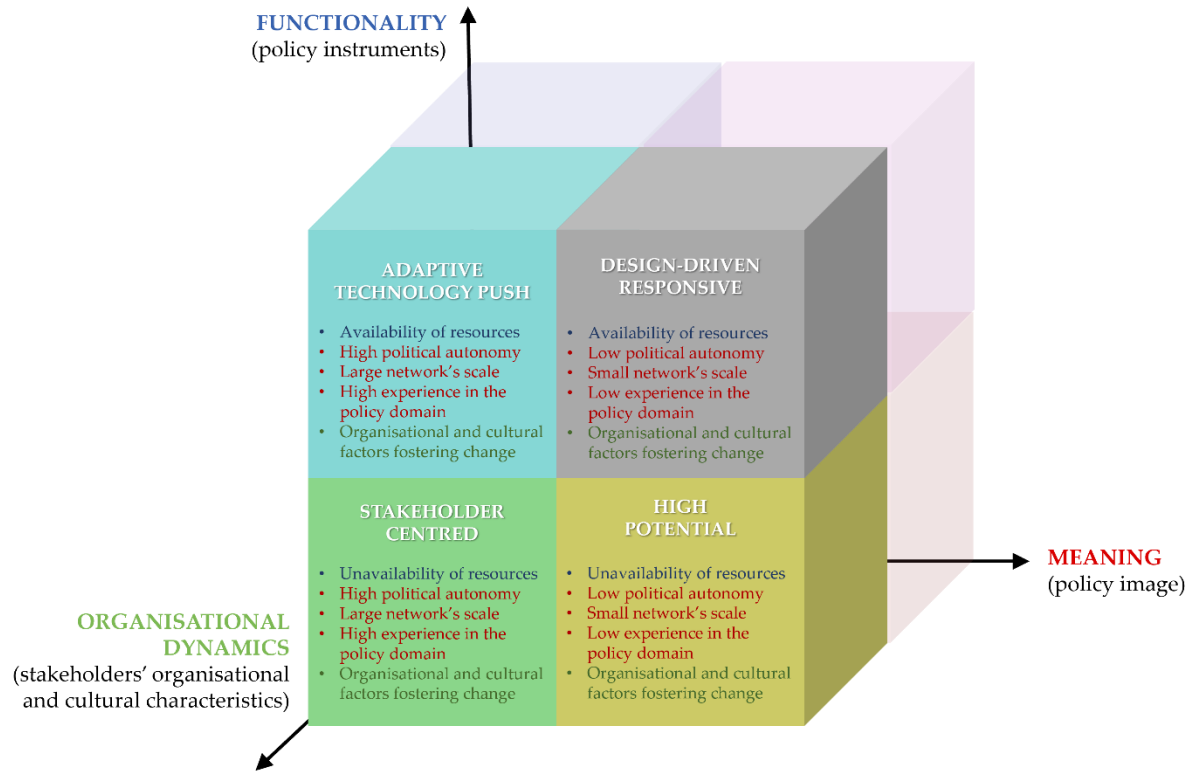
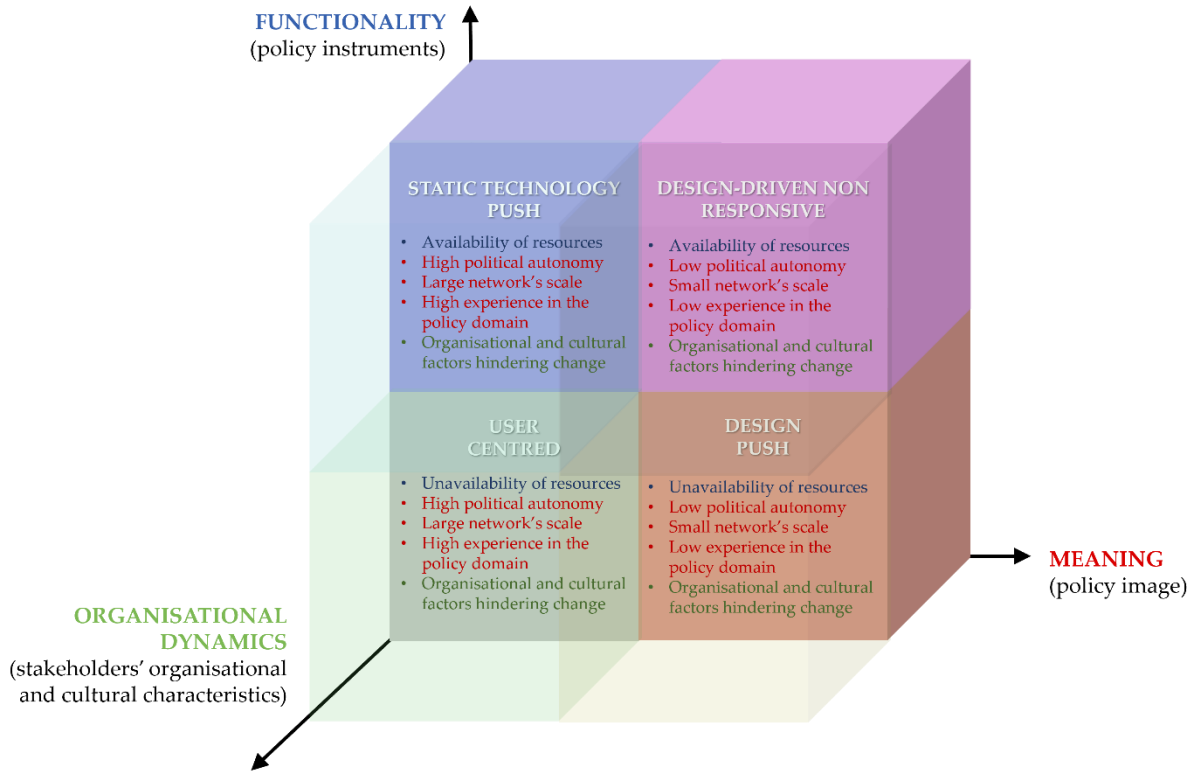


Figure 6.6: Types of innovation (passive reaction)



6.2.3. Technology push adaptive or static

Stakeholders who do not convey the policymaker's new meaning, thus reducing the radicality of policy change. However, they effectively implement the policymaker's novel designed tools and regulations. These stakeholders typically have large network's scale, extensive experience in the policy domain, significant political autonomy from the policymaker, and the availability of resources, which allows for quick adaptation to the policymaker's radical shifts in functionality.

- **ADAPTIVE**
  (organisational dynamics → transformative reaction)

  Stakeholders demonstrating organisational and cultural attributes that make them receptive to radical organisational changes contribute to an environment where major shifts are welcomed. In such a setting, there is a greater likelihood of fostering innovative policies that can be considered groundbreaking, thereby promoting radical policy innovation.

- **STATIC**
  (organisational dynamics → passive reaction)

  Stakeholders who display organisational and cultural characteristics that make them static and passive, hence less inclined towards organisational changes.

Consequently, the static nature of these stakeholders' behavior hinders the potential for radical policy innovation within the organisation.

6.2.4. Stakeholder or User-centred

Stakeholders who do not convey the new radical meaning and do not implement the new tools and regulations proposed by the policymaker. Typically, these are large-network's scale stakeholders with extensive experience, significant political autonomy, and limited resource availability. These attributes make it challenging for stakeholders to embrace the radical nature of the changes suggested by the policymaker. They tend to push for incremental innovation instead.

- **STAKEHOLDER**
  (organisational dynamics → transformative reaction)

  Organisational and cultural characteristics that predispose stakeholders to radical organisational changes. They do not, however, undergo organisational changes because they do not perceive or agree with the radical change in policy image designed by the policymaker.

- **USER**
  (organisational dynamics → passive reaction)

  Stakeholders with organisational and cultural characteristics that make them static and passive, hence less inclined towards organisational changes. These stakeholders are the most resistant to change and the furthest from the policymaker's radical intent.

6.2.5. High potential or Design push

Stakeholders who align with the policymaker's new radical meaning but struggle to implement the new policy instruments. Typically, these are stakeholders with a small network, limited experience, limited political autonomy from the policymaker, and limited resource availability. These factors make it difficult for them to adapt to the new policy's functionality while facilitating a relatively easy understanding and adaptation to the policymaker's new meaning.

- **HIGH POTENTIAL**
  (organisational dynamics → transformative reaction)

  Stakeholders with organisational and cultural characteristics that make them inclined towards organisational change. They hold significant potential as dynamic stakeholders inclined toward innovation, accurately interpreting the new meaning proposed by the policymaker. However, they face challenges in implementing the policy instruments, which, once overcome, allow the stakeholders to fully align with the Design-Driven innovation envisioned by the policymaker.

- **DESIGN PUSH**
  (organisational dynamics → passive reaction)

  Stakeholders with organisational and cultural characteristics that predispose them to passivity regarding organisational change. While these stakeholders comprehend the radical shift in meaning proposed by the policymaker, they do not align with the change at the organisational level, thus hindering the radical nature of innovation.

6.2.6. Design-Driven responsive or non-responsive

Stakeholders who agree with the policymaker's new meaning, positively influencing the radical nature of the policy change. Furthermore, they successfully implement the new designed policy instruments. They have a small network, limited policy experience, limited political autonomy from policymakers, and have adequate resource availability to implement functionality change. They are the stakeholders most closely aligned and attuned to the radical innovation proposed by the policymaker.

- **DESIGN-DRIVEN RESPONSIVE**
  (organisational dynamics → transformative approach)

  Stakeholders with organisational and cultural characteristics that make them inclined towards organisational change. In this scenario, the innovation will be entirely Design-Driven and radical, aligning perfectly with the one designed by the policymaker.

- **DESIGN-DRIVEN NON-RESPONSIVE**
  (organisational dynamics → passive approach)

  Despite understanding the radical shift in meaning and implementing the new tools proposed by the policymaker, these stakeholders are less inclined to organisational change. This hinders and impedes the full radicality of the policy change.

6.3. Policy implications

From a policymaker's standpoint, the model presented in the preceding section provides valuable insights for defining a process to design and develop radical policy innovations. This process is built upon Verganti's (2008, 2009) Metamodel while introducing specific adjustments. In the domain of product and service innovation, where the Metamodel was developed, radical changes in meaning and functionality are predominantly driven by decisions made by designers with support from key interpreters. In the realm of public policy, when policymakers aim to develop radical innovation, they must consider the significant influence wielded by the stakeholders in determining the ultimate outcome of the innovation process. Consequently, in this

context, relying solely on top-down directives from the “policy designer” proves insufficient for achieving completely radical innovation. Instead, a bidirectional process becomes imperative, also necessitating the alignment and active engagement of the subsystem stakeholders in the change process.

Specifically, for innovation to be truly radical, it is essential for the stakeholders to align with the policymaker's radical meaning change, implement new technological and regulatory change, and embrace transformative organisational dynamics. These three elements are shaped by the characteristics of the stakeholders, and the extent of the policymaker's influence varies among them.

Notably, within this trio of elements, the policymaker has the most substantial influence on the functionality change since there is a small potential gap between the policymaker's design of the tools and their actual implementation by stakeholders. This alignment is facilitated by the presence of diverse regulatory mechanisms designed to foster the radical transformation of subsystem along the functionality dimension. Furthermore, the policymaker can assist stakeholders in achieving radical change in functionality by providing them with the necessary resources and support.

Conversely, when addressing the dimension of meaning, the policymaker holds only partial influence on it. While the policymaker defines the new radical policy image, its effective perception and communication within the subsystem must also be achieved to generate a radical meaning change. In such scenario, policymakers must focus on devising effective communication strategies, fostering meaningful interactions, and actively engaging with stakeholders during the design phase to cultivate a greater willingness to embrace the new meaning. Nevertheless, certain stakeholders, due to their internal characteristics, may still exhibit reluctance toward change despite policymakers' efforts.

Lastly, organisational dynamics constitute the area where the policymaker has minimal to no influence. This is primarily a consequence of the fact that resistance to change within an organisation frequently originates from well-established internal organisational and cultural factors. These factors operate independently of policymakers' control and exhibit a resistance to external influences. They are deeply intertwined with the intricate interplay of individual and group behaviours, attitudes, and historical practices, collectively strengthening the barriers that hinder any attempts to modify organisational dynamics.

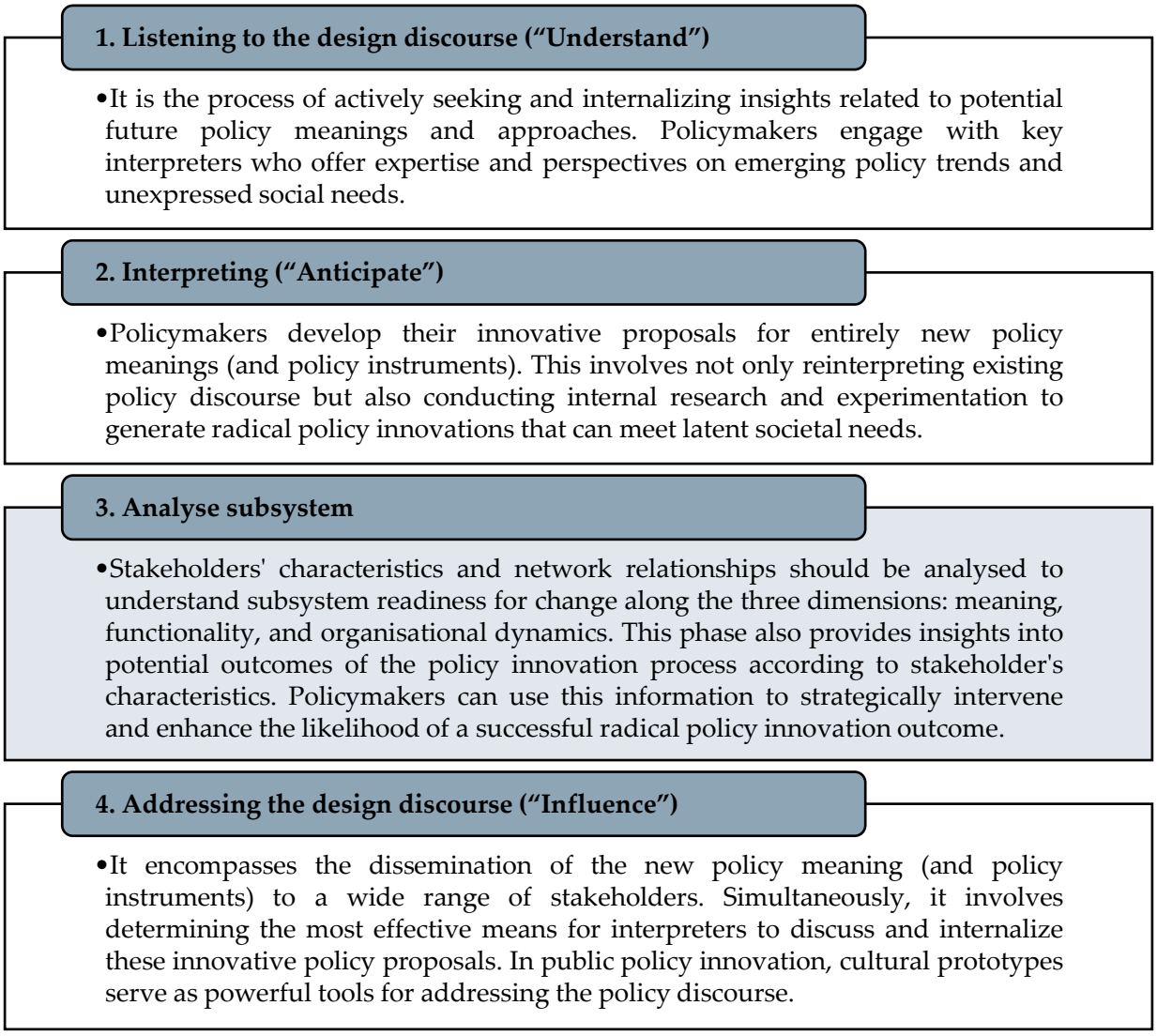
Therefore, when a policymaker aims to design a radical innovation within the context of public policies, it is necessary to consider these three dimensions and the respective influence that the whole subsystem exerts on each of them. These concepts can be translated into three fundamental questions that the policymaker must address during the design phase of the new public policy:

1. How can I align the entire subsystem with the new meaning?

2. How can I align the subsystem with technological and regulatory change?
3. How can I achieve these two objectives despite the organisational dynamics of the subsystem?

These considerations underscore the necessity of introducing an additional phase into Verganti's Metamodel (2008, 2009) when adapting it to the context of public policies. This supplemental phase, termed the "analysis of subsystem dynamics (stakeholder characteristics and network relationships)", involves evaluating both the characteristics of the subsystem and the network of relationships among its stakeholders. This comprehensive assessment aims to anticipate the outcomes of radical innovation. The resulting process (Figure 6.7), outlines the steps policymakers should follow when designing and implementing radical policy innovations.

Figure 6.7: The public policy Metamodel



6.4. Managerial implications

This study's managerial implications are focused on the third dimension of the model: organisational dynamics of stakeholders. To bolster their innovativeness and embrace change, organisations must strategically prioritize the modification of their organisational and cultural characteristics. The empirical analysis identifies key variables crucial for fostering a transformative organisational approach, positively contributing to adaptability, innovation, and effective change navigation. These insights provide actionable guidance for leaders aiming to cultivate an environment conducive to sustained innovation. Key recommendations include:

1. *Human resources empowerment.* Granting employees more autonomy in task execution fosters responsibility and creativity, creating a culture of innovation. This approach not only promotes individual growth but also contributes to a dynamic and adaptable organisational environment, essential for sustained success.
2. *Organic organisational structure.* Having an organic organisational structure promotes innovation by fostering a culture of creativity, empowering employees, encouraging collaboration, and facilitating adaptability. It allows organisations to be more responsive to change and customer demands while supporting risk-taking and the pursuit of new and inventive solutions.
3. *Collaboration with external stakeholders*. Actively engaging with external partners brings fresh perspectives, knowledge, and innovation opportunities. This strategic collaboration expands the organisation's understanding of industry trends, fosters creative problem-solving, and ensures a competitive edge in the dynamic market landscape.
4. *Experimentation culture.* Cultivating a culture that encourages creative thinking, experimentation, and views failure as a learning opportunity fosters innovation. This mindset accelerates the innovation process, promotes adaptability, and reinforces continuous improvement within the organisation.
5. *Supportive and collaborative environment.* Establishing a workplace where employees feel supported and encouraged to share ideas and collaborate fosters a culture of innovation. This collaborative spirit enhances teamwork, facilitates knowledge sharing, and empowers individuals to contribute to inventive solutions, ensuring sustained innovation and organisational success.
6. *Effective leadership*. Providing strong and effective leadership that guides and inspires the organisation's members towards innovative thinking and practices. This entails establishing well-defined objectives, fostering an innovation-oriented culture, and ensuring the allocation of essential resources and support for innovative initiatives.

An organisation that incorporates and values these characteristics will position itself as a more innovative and agile entity. Therefore, it is imperative that at the managerial level, there is recognition of the relevance of these factors and that strategic actions are taken to integrate them into the fabric of the organisational culture. By doing so, when confronted with policy innovation or any other form of change, the organisation is better equipped to leverage the opportunity to cultivate internal innovation, thus ensuring its continued competitiveness in the market. In a rapidly evolving landscape, these strategic considerations can be the key to long-term success.

7 Conclusion

This thesis has undertaken a comprehensive examination of the public policy innovation process. The primary objective of this study was to address the constraints of PET (Baumgartner & Jones, 1991), which describes the policy innovation process from a macro-level perspective. This objective was pursued through the application and extension of Design-Driven innovation theory (Verganti, 2008), focused on product and service innovation. It is noteworthy that both theories hold significant importance in the innovation literature and share the common premise that radical change is generated through a shift in meaning, referred to as policy image in PET.

To address the research questions, a qualitative research methodology was employed, including semi-structured interviews and a meticulous process of coding and triangulation, complemented by a review of the existing literature. This analysis highlighted the limitations of Verganti's (2008) theory, which required extensions and modifications to become fully applicable in the realm of public policies. In particular, the empirical analysis emphasized the pivotal role of subsystems in shaping the outcomes of policy innovation. Stakeholders within the subsystems can either align or obstruct the innovations proposed by policymakers, based on their characteristics and internal dynamics. In particular, characteristics influencing the innovation process along meaning and functionality dimension, include scale, experience, level of political autonomy, and the availability of resources for implementing change.

Moreover, the emergence of codes related to stakeholders' organisational and cultural characteristics, in conjunction with a thorough analysis of the literature, emphasized the necessity of introducing a third dimension, in addition to the existing ones of meaning and technology, to understand the outcomes of a Design-Driven innovation. This dimension was termed "organisational dynamics" and is divided into two stages: transformative reaction, encompassing organisations with characteristics and dynamics conducive to organisational change, and passive reaction, encompassing those with attributes that make them passive and resistant to change. The empirical analysis specifically reveals that the inclination towards organizational change is influenced by the presence or absence of key variables, including empowered human resources, collaboration with external stakeholders, supportive and collaborative environment, organic organisational structure, and effective leadership.

The intersection of these three dimensions — meaning, functionality, and organisational dynamics —, further subdivided into two distinct phases —

incremental and radical —, culminated in the development of a comprehensive three-dimensional model. This model encompasses eight distinct areas, each corresponding to a distinct outcome of a radical Design-Driven innovation, contingent upon the diverse characteristics and internal dynamics of the subsystem.

Furthermore, the new comprehensive framework, developed by extending the Design-Driven innovation theory (Verganti, 2008), can be considered complementary to PET (Baumgartner & Jones, 1991). Indeed, both theories are grounded in the notion that radical change is driven by a shift in policy image, but the new framework allows for a more granular analysis, including the influence of micro-level dynamics and characteristics of subsystems in determining the extent of radical policy innovations.

In conclusion, this thesis contributes to a more detailed understanding of public policy innovation by providing not only theoretical contributions but also practical insights for policymakers seeking to develop radical policy change and drive innovation in the public sector. Additionally, it presents managerial implications for companies aspiring to cultivate an organisational culture that nurtures innovation.

7.1. Limitations

My results should be considered merely as a preliminary quest, since this thesis adopts an exploratory strategy and not a confirmatory or prescriptive one. Consequently, the comprehensive framework introduced in the previous chapter requires further development and examination to achieve practical relevance.

In terms of the interview process, it is essential to acknowledge that the insights gained are based on the analysis of information provided by individuals drawing from their personal experiences and subjective viewpoints. Consequently, interviewees may introduce biases into the information provided. Additionally, it is important to note that all stakeholders considered in this study are organisational, limiting the applicability of this framework exclusively to this typology of stakeholders.

Furthermore, another limitation concerns the generalizability of this work. The exclusive focus on a single public policy, such as the Digital Civilian Service, increases the risk of producing “idiosyncratic phenomena” (Eisenhardt, 1989), which makes it challenging to generalize the findings to other contexts or policy innovation typologies. Indeed, while this policy innovation is radical in both meaning and functionality, other policies may exhibit radical characteristics in just one dimension or incremental changes in both.

Moreover, an additional constraint lies in the omission of an examination of the policymaker's organisational dynamics. This study is grounded on the assumption that the policymaker, as the proponent of radical change, possesses transformative organisational dynamics.

Lastly, a final limitation of this study pertains to the functionality dimension, which did not emerge immediately as fully radical due to obstacles and implementation delays in policy instruments. This limitation hindered a comprehensive analysis of the impact of this variable on the dynamics of policy change.

7.2. Agenda for future research

Several perspectives emerge in the context of future research that can further enrich and expand on the proposed results.

First, combining qualitative and quantitative approaches would be extremely beneficial. This would allow for more accurate and objective model testing and validation, providing a more comprehensive view of the dynamics of the policy change process.

Another compelling area for future research is the application of the concepts and constructs developed in this work to different types of public policies and to different contexts. This has the potential not only to generalize the model but also to uncover new subsystem dynamics and characteristics that influence the policy change process across a range of scenarios.

Additionally, an uncharted territory awaiting exploration is the expansion of stakeholder analysis to encompass a broader spectrum of actors. Examining how various groups, including citizens and advocacy organizations, exert influence on policy innovation could provide valuable insights. Additionally, delving into the organizational dynamics of policymakers—a facet untouched by this study—and scrutinizing their impact on the innovation process represents a fertile area for future exploration.

Finally, a focused and in-depth examination of the functionality change and the dynamics that facilitate radical innovation within this dimension holds promise. Such an investigation could significantly contribute to the understanding of policy change process and the critical variables that shape it.

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