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Design Thinking in Public Policy Design: A Typological Study

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Abstract: In recent years, design has emerged as a method for shaping public policies and services. This article employs a typological research approach to analyze the application of design thinking in the field of public policy. Its aim is to elucidate the developmental trajectory of design thinking, assist designers in gaining a better understanding of the unique context of public policy, and promote the further evolution of design thinking in the domain of public policy. Through literature analysis and comprehension, this article is built upon the foundation of public sector policy labs. It constructs an analytical framework based on two dimensions, "institutional nature" and "participation stages," categorizing public sector innovation labs in the field of public policy into three types: exploratory labs, executive labs, and collaborative labs. It also summarizes the classification criteria and characteristics of each type of lab. Furthermore, the article explores the inherent logical relationships between different types of labs, offering a systematic and scientific analysis to facilitate the integration of design thinking into public policy.

Keywords: design thinking, public policy, public sector innovation lab, typology

1. Introduction

As social challenges increase, governments are shifting from traditional policy approaches to flexible, collaborative methods like design thinking. This emphasis on holistic innovation is gaining traction in policy innovation. Design thinking is regarded as a new participatory method in public policy and service design, incorporating creativity and imagination. Despite its strong momentum, there is a lack of typological research on its application. This paper reviews existing research, traces its history, clarifies its current status, categorizes it by institutional nature and participation stage, and provides guidance.

2. Defining Design Thinking in Policy Design

2.1. Defining Design Thinking

In the realm of design thinking studies, common keywords include user-centeredness, prototyping, and iterative design, reflecting its user-focused iterative approach. Design thinking initiates from the user's perspective, continually assessing their needs, expectations, and behaviors. By understanding real user needs and experiences, it aims to deliver more relevant products and services, enhancing

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user satisfaction. Innovation is both a hallmark and objective of design thinking, encouraging departure from traditional analytical methods in favor of intuitive, divergent, and imaginative approaches. Unlike traditional scientific analysis, design thinking is a creative process emphasizing iteration and feedback, promoting the exploration of novel possibilities through inventive and innovative models [1]. It inherently embraces openness and non-linearity.

2.2. Historical Development of Design Thinking

Design thinking research illuminates the cognitive process behind successful design outcomes, enriching our comprehension of design's internal mechanisms and its potential for addressing diverse problems. In 1969, Nobel laureate Herbert Simon introduced design as a problem-solving approach in his book 'The Sciences of the Artificial,' outlining the initial analysis-synthesis-evaluation linear model [2]. In 1987, Professor Rowe coined the term 'design thinking' in his publication 'Design Thinking.' [3] In 1992, Buchanan proposed design thinking as a versatile problem-solving tool across domains [3]. Stanford University established the d. school in 2005, fostering interdisciplinary design thinking education [3]. By 2012, The Wall Street Journal acknowledged the rising influence of design thinking in business management [3]. Originating in industrial design, design thinking has expanded across disciplines like psychology and anthropology, becoming integral in business, government, education, and non-profit sectors.

2.3. Design Thinking in Policy Design

For policy practitioners, design thinking offers a 'bottom-up' approach, contrasting with traditional policy design. It values empathy, curiosity, and rationality, fostering a systemic, interdisciplinary problem-solving perspective. Design thinking aims to bridge government-public gaps through participatory methods, often utilized in public sector innovation labs. In these labs, it serves as a 'community engagement tool', generating policy-relevant knowledge via prototyping, continuous development, iteration, and self-correction. Denmark's MindLab, an early innovation lab, embodies design thinking throughout its work. The digital age has furthered design thinking's growth in policy. This study examines public sector innovation labs as a conduit for exploring design thinking's application in policy design, using their activities as a representative example.

3. Analytical Methods

3.1. Literature Screening

To comprehensively review relevant literature without database bias, this study conducted searches in Web of Science (WoS) and Scopus. The focus was on titles related to 'public sector innovation labs' to ensure relevance. Only English-language literature was considered. The research field was confined to disciplines closely related to policy design, like management and public administration. A less strict threshold was applied, selecting literature with at least 1 citation, yielding 40 articles after deduplication (initially 63).

3.2. Analysis of Public Sector Innovation Labs

In public sector innovation labs literature, most studies use methods like multiple case analysis and comparative research to evaluate different aspects of lab value and debates. Some labs are mentioned in multiple studies, offering more publicly available information for systematic analysis. This study analyzes and categorizes labs mentioned at least twice in the literature, as presented in Table 2.

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Table 1: Names of Labs and Focus Cities.

Laboratory name	Barcelona
Barcelona Urban Lab	Canberra
DesignGow	Mexico City
Datos Abiertos (Digital Nation Mexico/Open Mexico)	Landon
Finance Innovation Lab	Paris
Experimental Fund for Youth	London
Futurelab	New York
Govlab	Helsinki
Helsinki Design Lab	Singapore
Human Experience LabyDesign Thinking Unit	New York
iZone (NY City Innovation Zone, Department of Education)	Amsterdam
Kennisland	Mexico City
LabPlC (laboratory for the City)	Toronto
MaRS Solutions Lab	Boston
Mayor's Office of New Urban Mechanics	Copenhagen
MindLab	Landon
Nesta Innovation Lab	New York
Public Policy Lab	Kent
SILK (Social Immovation Lab Kent)	YorkKent
Sitra	Helsinki
TACSI (The Australian Centre for Social innovation)	Adelaide
	Total:20

4. Design Thinking Typology and Its Manifestation Characteristics

This study categorizes the design thinking characteristics in public policy design into two dimensions: "institutional nature" and "participation stage", and conducts a classification study. By referring to the policy science literature related to Policy Advisory Systems (PAS), a comparison is made between public sector innovation labs and other policy participants to analyze the relationship between public sector innovation labs and the government and determine the institutional nature of the labs. In addition, the study examines the level of substantive impact that the labs have on policy design by considering their participation stage in various public projects. This is achieved by synthesizing relevant descriptions and arguments regarding the participation stage in the literature, aiming to elucidate the current value of design thinking in the field of policy design.

4.1. Institutional Nature Dimension

In Policy Advisory Systems (PAS) literature, policy participants are typically categorized based on two dimensions: their proximity to government and their level of government authority. This categorization assumes that those closer to administrative power wield more influence [4]. However, it's important to clarify that public sector innovation labs, as innovative entities, challenge the traditional government bureaucracy. The closer a lab is to the government's internal structure, the more complex the constraints on innovation implementation. This presents a dilemma described by scholar Mulgan as radical innovators face the risk of being overlooked when distant from government work but may lose their radical approach when working centrally within it [5]. Therefore, this study doesn't emphasize lab location within government institutions but rather their level of government

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funding and resources. Labs are classified as independent-operating, government-supported, or government-led based on categories listed in Table 2.

4.2. Participation Stage Dimension

The policy design cycle framework is a widely used conceptual tool for organizing the complexity of decision-making in policy design. Despite criticisms of oversimplification, it remains practical and convenient [6]. The cycle typically comprises five stages: agenda setting, formulation, decision-making, implementation, and evaluation. This study classifies public policy design lab activities into six types related to policy:1. Problem identification and agenda setting (e.g., research data generation). 2. Recommending solutions and identifying potential fixes (e.g., brainstorming). 3. Solution testing (e.g., prototype design). 4. Decision-making (e.g., selecting action plans). 5. Implementing policy tools or scaling up solutions. 6. Monitoring and evaluation.

These activity types guide the classification of public sector innovation labs' participation stages in policy design. Through literature analysis, this study seeks insights into design thinking's role and impact in policy design.

Table 2: Government Funding Types for Laboratories.

Funding type	Laboratory name
Independent operation (No government funding)	GovLab
	Finance Innovation Lab
	MaRS Solutions Lab
Government support (Partly funded)	Futurelab
	Kennisland
	Public Policy Lab
	TACSI(The Australian Centre for Social innovation)
	Nesta Innovation Lab
	Mayor's Office of New Urban Mechanics
	MindLab
	Experimental Fund for Youth
	LabPLC (Laboratory for the City)
	Sitra
Government-led (Wholly funded)	Human Experience Lab/Design Thinking Unit
	SILK (SocialInnovation Lab Kent)
	Barcelona Urban Lab
	Datos Abiertos (Digital Nation Mexico/Open Mexico)
	iZone(NY City lnnovation Zone, Department of Education)

Based on literature analysis, this study identified that public sector innovation labs primarily engage in problem identification during policy formulation and solution testing. Decision-making and implementation activities receive minimal attention in these labs. This aligns with design thinking's focus on people-centered approaches, particularly in problem identification and definition stages, bridging the gap between government and the public, thereby enhancing policy democratic legitimacy. Prototyping and iterative testing, core elements of design thinking, correspond to the solution testing phase in policy design. They assist policymakers in assessing solution feasibility, predicting outcomes under various conditions, risk evaluation, and risk management strategies. Public

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sector innovation labs can be categorized as either problem identification-oriented or solution testing-oriented based on their application in these stages.

Table 3: Laboratory Involvement Stages.

Participation stage	characteristic	example
problem recognition	Co-design, people-centeredpublic participation	GovLab
		MaRS Solutions Lab
Scheme test	Prototype testingiterative testing	Sitra
		Nesta Innovation Lab

4.3. Typological Study

This study categorizes public sector innovation labs (e. g., design thinking) into three types: executive, exploratory, and supportive, based on government funding levels and involvement in the policy design process. While businesses and the public can influence policy formulation, the government plays a central role. Independent labs, due to their distance from power centers, are considered supportive in policy design. Government-supported or government-led labs are classified as exploratory or executive, depending on their involvement stage. Exploratory public sector innovation labs, led by the government, focus on early policy design stages, emphasizing problem definition and exploration. They promote innovation by addressing upfront issues through research, experimentation, and divergent-convergent thinking. Executive public sector innovation labs, also government-led, concentrate on policy testing, assessing feasibility through activities like prototype design and iterative testing. They transform proposals into actionable models, engaging users for feedback while maintaining transparency and scientific rigor. Supportive public sector innovation labs, operating independently, provide comprehensive support to government entities in data, proposals, and policy design. They possess specialized capabilities, collect and analyze data, and offer scientific evidence for a deep understanding of policy issues.

Table 4: Laboratory Classification.

type	standard of classification	characteristic
Exploratory laboratories	Participate in the stage of problem definition. and identification in policy design. With government funding.	Focus on the front end of policy design. Government-led.
Executive laboratories	Participate in the verification and evaluation of the feasibility of the scheme. With government funding.	Execute scheme test. Government-led.
Supportive laboratories	Provide information, resources, etc, for government subjects. Without government funding.	Assist the main body of government. Independent operation.

4.4. Intrinsic Logic

In practical public sector innovation labs, some engage in both problem identification and solution testing, blurring the line between exploratory and executive labs. These are categorized as hybrid labs. Independent supportive labs, with a distinct funding model from government-led labs, do not intersect with them.

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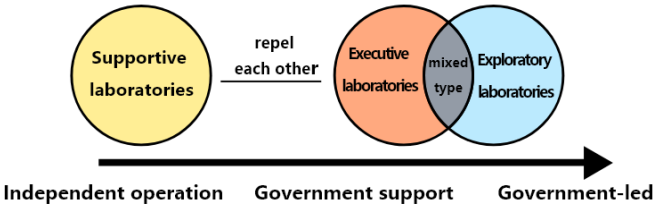

Figure 1: Intrinsic Logic among Different Types.

5. Conclusion

The diversification of social needs and the growing complexity of the social environment have made public policy innovation crucial for governments. Design thinking has emerged as a solution, rapidly advancing in public policy through innovation labs. Scholars see these labs as catalysts for design thinking in policymaking. This study categorizes them into exploratory, executive, and supportive types, based on institutional nature and participation stage. Exploratory labs focus on problem definition, executive labs on testing policies, and supportive labs assist government entities.

Design thinking integration into public policy has introduced innovative methods and approaches. As Giudice and Ireland noted, it has already transformed services and interactions and holds potential to impact companies, industries, nations, and more [7]. To adapt to the future, design thinking in policy must evolve, enhance foresight, and fully unleash its transformative potential. Leveraging design's power can lead to more effective policy innovation for the public.

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