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PUBLIC SECTOR INNOVATION: EXPLORING HOW PUBLIC ORGANIZATIONS CAN FOSTER A CULTURE OF INNOVATION, ADOPT NEW METHODS, AND SCALE SUCCESSFUL PILOTS

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Abstract

The systematic review investigated public organizations' methods to create innovation-oriented environments through their implementation of design thinking and behavioral insights, together with their expansion of successful pilot projects. The researchers used PRISMA 2020 guidelines to conduct a complete systematic literature search, which examined Scopus, Web of Science, Google Scholar, JSTOR, EBSCOhost, OECD iLibrary, and Nesta for articles published between January 2021 and April 2026. A total of 47 empirical studies and systematic reviews met the inclusion criteria. Thematic synthesis revealed that psychological safety, together with leadership commitment to experimentation and tolerance for intelligent failure, innovation-inclusive performance metrics, and collaborative cross-silo structures, created environments that encouraged innovation. The organization faced multiple barriers to innovation because of its risk-averse culture, which emerged from its legal and audit frameworks, short-term political cycles, hierarchical career structures and budgetary silos, legislative constraints, and leadership turnover. The organization encountered difficulties with design thinking because 67% of its design thinking initiatives reached their final operational stage through the prototyping phase, and 74% of behavioral insights interventions stayed at their basic nudge stage, which resulted in 11% and 17% of successful institution cases, respectively. The analysis showed a sustained "pilot-to-permanent gap" which resulted in less than 30% of successful pilots becoming mainstream operations three years later. Cultural elements and methods combined with scaling activities to create positive feedback loops, according to 60% of studied cases, while the accountability-learning paradox and scaling paradox created recurrent failure patterns that affected 40% of studies. Institutional Theory and Normalization Process Theory received validation; Public Service Logic received partial validation; the Dynamic Capabilities Framework needed public sector capability sequencing to be defined. The assessment found that public sector innovation can succeed but requires sustained dedication to multiple factors, which include cultural enablers, method fidelity, scaling infrastructure, and their respective interactions.

Keywords: Public sector innovation, Design thinking, Behavioural insights, Scaling, Innovation culture, Psychological safety, Pilot-to-permanent gap, Systematic review

Introduction

Public sector organizations worldwide currently confront their strongest combination of three different forces, which include growing societal problems that arise from aging populations and climate adaptation and digital transformation, and which run parallel to increased public demand for effective service delivery and operate under enduring budget limitations (Arundel et al., 2022; Osborne & Brown, 2024). Public sector organizations develop their innovative solutions through institutional frameworks that revolve around three main elements: political accountability and legal procedural requirements, and risk management practices (De Vries et al., 2023; Sørensen & Torfing,

2024). The systematic review research investigates two essential research problems, which involve public organizations that need to create an innovative work environment, while they implement design thinking and behavioral insights, and their pilot projects transform into permanent operational changes. The study demonstrates its vital presence through recent evidence, which shows that public sector innovation work behavior develops from complex interactions between individual factors, organizational elements, and environmental conditions, while leadership style and organizational culture function as main drivers of this process (Cinar et al., 2023; Miao & Kim, 2024).

Recent academic research has developed new knowledge about innovation enablers at the same time that it has revealed ongoing research deficiencies. Public Value Theory and Open Innovation and Collaborative Governance were combined by Brilhante and Moreira (2025) into a conceptual framework that demonstrates that adaptive methodologies, especially Innovation Labs and Living Labs, succeed in prototyping solutions, but they fail to establish permanent learning systems. Chen et al. (2024) conducted a systematic review, which showed that OECD countries now have more behavioral insights teams than before, but their programs still focus on nudge strategies instead of creating fundamental changes to their policy development methods. Williams and Lee (2023) evaluated 47 public sector pilots to discover that their research established a "pilot-to-permanent gap" because organizations needed to overcome three obstacles, which included budget silos and legislative restrictions, and executive changes. Clarke and Ercan (2025) proved that municipal design thinking programs produce user-focused prototypes, but their organizations block the necessary iterative testing process because they follow strict compliance and hierarchical structures.

The review combines evidence from five years between 2021 and 2026 to answer three linked research questions, which include (1) Which specific organizational and leadership practices successfully create a pro-innovation environment in public institutions? (2) What steps do organizations take to implement design thinking and behavioral insights into their existing systems? (3) Which elements help or hinder the process of expanding from pilot programs to full implementation? The study establishes a multi-level framework that identifies micro-level individual skills and risk tolerance, along with meso-level organizational culture and leadership, and macro-level systemic rules and political support as essential factors that determine innovation success through its integration of research results from public administration, innovation management, and policy design fields. The research provides public managers with practical solutions that help them achieve sustainable and widespread organizational transformation, while theoretical research establishes contemporary institutional theory and public service logic for current governance frameworks (Ansell et al. 2024, Torfing et al. 2025).

Review Question (Primary & Sub-questions)

Primary question: What factors enable or hinder public sector organizations in fostering an innovation culture, adopting design thinking and behavioural insights, and scaling successful pilots?

Sub-questions:

- 1) Culture: Which organizational and leadership practices reliably foster a pro-innovation culture in public settings?
- 2) Methods: How are design thinking and behavioural insights adopted, adapted, and institutionalized in public sector contexts?
- 3) Scaling: What barriers and facilitators affect the transition from pilot to scale in public innovation?
- 4) Interactions: Do culture, methods, and scaling mechanisms interact synergistically or antagonistically?

Methodology

Theoretical Framework

The study evaluates public sector organizations through four different theories, which explain how organizations develop innovative cultures, implement new practices, and extend their pilot projects. The research problem needs four different theories because each one provides a unique perspective.

Institutional Theory (DiMaggio & Powell, 1983)

Institutional theory shows why public organizations tend to reject new ideas because outside forces demand changes. DiMaggio and Powell (1983) identified three mechanisms of institutional isomorphism that drive organizations to adopt similar practices instead of pursuing innovative solutions. Public sector organizations demonstrate these forces through their strict procurement regulations, their civil service protection systems, and their audit practices, which emphasize following rules instead of testing new ideas (De Vries et al., 2023; Sørensen & Torfing, 2024). Recent scholarship has extended this framework to show that institutional barriers to public sector innovation exist as different obstacles that change according to the specific policy area, government tier, and administrative practice (Cinar et al., 2023; Arundel et al., 2022). The research question about innovation culture barriers needs researchers to understand isomorphic pressures for its solution.

The study uses institutional theory to analyze how cultural barriers and scaling problems affect institutional operations. Contemporary research demonstrates that successful public sector innovators do not simply ignore institutional constraints but strategically navigate them by creating "protected spaces" such as innovation labs, sandboxes, or waivers from standard rules (Brilhante Moreira, 2025; Ansell et al., 2024). The spaces create a temporary environment that decreases all coercive and normative pressures, so design thinking and behavioural insights pilots can run their experiments using different operational guidelines. The institutional theory indicates that innovations will discontinue their new methods when the protected space ends because organizations require formal integration through permanent changes that include updated performance metrics and revised regulations (Williams Lee 2023, Torfing et al 2025). The framework provides a direct solution to sub-questions that investigate cultural enablers (Question 1) and scaling barriers (Question 3).

Public Service Logic (Osborne, 2018; updated by Osborne & Brown, 2024)

Public Service Logic (PSL) emerged as a critique of New Public Management's focus on efficiency and competition, because it proposed that public services develop through user, professional, and organizational collaboration within complex service environments. Osborne (2018) proposed that public service innovation must begin with user value creation. The logic of this framework enables organizations to implement design thinking, which uses human-centric design methods that emphasize understanding user needs through successive product testing and evaluation (Clarke & Ercan, 2025). Osborne and Brown (2024) developed PSL through their research by introducing digital transformation and multi-actor governance, which demonstrates that effective public innovation demands integration between policy design and front-line service delivery and citizen feedback systems.

The study establishes design thinking and behavioural insights as innovation techniques through their theoretical justification according to PSL. Sustainable innovation emerges from public organizations through their use of user perspectives for both problem definition and solution testing, according to PSL. Chen et al. (2024) applied PSL to evaluate behavioural insights units across OECD countries, finding that interventions co-designed with citizens produced longer-lasting behaviour change than expert-driven nudges. The PSL framework demonstrates how cultural factors shape research methodologies according to sub-question 4. Organizations that support innovation through psychological safety and learning enable staff to test user-centered methods, whereas organizations that practice hierarchical blame culture block design thinking's essential testing of new ideas through its risk-taking process (Miao & Kim, 2024; Cinar et al., 2023).

Normalization Process Theory (May & Finch, 2009; updated by May et al., 2022)

Normalization Process Theory (NPT) explains how social and organizational systems adopt new practices, technologies, and innovations until they become standard operating procedures. The authors of the research study proposed four essential components, which include coherence for understanding the innovation, cognitive participation for establishing engagement and commitment, collective action for executing the innovation, and reflexive monitoring for assessing progress and making changes through time. The NPT model demonstrates how people and teams

need to execute ongoing work for their new ideas to become part of their regular business activities, whereas diffusion theories only consider adoption as a single moment. The public sector operates under this principle because pilot programs tend to achieve success during testing phases, but they struggle to maintain performance during regular operations because organizations do not properly implement their standardization procedures.

The systematic review uses NPT to analyze scaling through its third sub-question, which assesses the connection between pilot projects and systemwide establishment. A pilot may demonstrate effectiveness (e.g., a behavioural insights intervention reducing administrative burden) but without coherence across stakeholder groups for instance, if front-line staff do not understand why the new method differs from standard practice normalization fails (Chen et al., 2024). Clarke and Ercan (2025) used NPT to examine design thinking implementation in four local governments and found that organizations used reflexive monitoring poorly because they failed to review their operations, which resulted in prototype abandonment after funding ended. NPT also contributes to sub-question 4 by showing that psychological safety for reflexive monitoring, which design thinking uses through its iterative cycles, must establish an organizational culture that functions as a fundamental requirement for building sustainable shifts in operations (Torfing et al., 2025).

Dynamic Capabilities Framework (Teece, 2007; adapted for the public sector by Torfing et al., 2025)

The dynamic capabilities framework started as a method to show how companies maintain their market edge through their ability to identify market prospects and capitalize on them by developing novel goods and operational methods while their organizational framework shifts. Dynamic capabilities enable organizations to change their resource management methods according to fast-moving environmental changes, according to Teece 2007. The public sector framework developed by Torfing et al. (2025) uses public value creation for its main element instead of competitive advantage, and it defines specific capabilities that include political astuteness, cross-sectoral collaboration, and regulatory experimentation. The research found that public organizations with strong dynamic capabilities can expand their pilot programs because they use their ability to shift budgets and change legal definitions, and update performance indicators for innovative developments.

In this review, the dynamic capabilities framework unifies the three main aspects of the primary research question. Organizations need to create an environment that supports innovation through sensing, which requires them to let front-line workers and citizens report problems and opportunities without facing punishment (Miao & Kim, 2024). Organizations require dedicated innovation units, training programmes, and leadership support to experiment with new design thinking and behavioural insights methods (Brilhante & Moreira, 2025). Organizations need to establish formal processes that involve formal procedures, budget management, and daily practices to learn from their pilot programs (Williams & Lee, 2023). The framework establishes predictive relationships of combined effects, which show that a learning culture (sensing) enables method adoption (seizing) that produces evidence for system transformation (transforming) while weak sensing capabilities create pilots that do not align with central objectives and remain untested (De Vries et al., 2023; Sørensen & Torfing, 2024).

Methodology

Review Design

The research used the Preferred Reporting Items for Systematic Reviews and Meta-Analyses 2020 statement from Page et al. 2021 to establish its transparent and reproducible research methods. Public sector innovation studies show diverse research outcomes that include both qualitative case studies and quasi-experimental policy evaluations, which required researchers to conduct thematic synthesis through systematic literature review instead of using meta-analysis (Thomas & Harden, 2008). The research team did not pre-register their review protocol because they needed to explore sub-question 4, which focused on interactions, yet they documented all search strings, inclusion criteria, and analytical decisions to create a detailed record that would enable others to replicate their work.

Search Strategy

The following electronic databases were searched from January 2021 to April 2026 to capture the most recent evidence while maintaining manageable scope: Scopus, Web of Science Core Collection, Google Scholar (first 200 most relevant results), JSTOR (Public Administration collection), EBSCOhost (Public Administration Abstracts and Political Science Complete), OECD iLibrary, and Nesta (innovation grey literature). The search string was adapted for each database syntax as follows: ("public sector" OR "public administration" OR "government" OR "local government" OR "municipal" OR "public agency") AND ("innovation culture" OR "innovative work behaviour" OR "learning organization" OR "risk tolerance" OR "psychological safety") AND ("design thinking" OR "human-centered design" OR "behavioural insights" OR "nudge" OR "behavioral economics") AND ("scaling" OR "scale-up" OR "pilots" OR "mainstreaming" OR "roll-out" OR "replication"). The research team utilized multiple search methods, which included backward citation searching for article references backward citation searching and forward citation searching through Google Scholar's "cited by" function and hand-searching three main journals, which were Public Administration Review, Public Management Review, and Government Information Quarterly, for the period between 2021 and 2025.

Inclusion and Exclusion Criteria

The inclusion of studies required compliance with three specific criteria, which demanded that studies should present their findings through either peer-reviewed journal articles, book chapters or high-quality grey literature, which included documents from OECD, World Bank, Nesta, and Bloomberg Harvard. The research required empirical studies that used either qualitative or quantitative or mixed methods or systematic reviews; it needed to study national, regional, and local government organizations; it had to show direct evidence of evaluation through one of the four sub-questions, which examined culture and methods, scaling, and interactions. The study required English language base material which needed to be published between January 2021 and April 2025. The study excluded materials that investigated only private sector and non-governmental organization operations because they lacked a public sector comparison. The study excluded non-English publications because of translation resource constraints. The study excluded opinion pieces and editorials, conference abstracts that lacked full text, and books that lacked empirical data. The study excluded works that examined technological innovation through IT systems because they failed to consider organizational culture, methods, and scaling processes.

Screening and Selection Process

Screening followed the PRISMA flow model in four stages. First, researchers collected records from databases during identification and used Zotero 6.0 reference management software to remove duplicate records. Second, the two independent reviewers assessed titles and abstracts through the title and abstract screening process while they followed the inclusion criteria and resolved their disagreements through discussion or third reviewer assessment. Third, the researchers obtained full texts of all records that had potential eligibility and two reviewers conducted independent eligibility assessments while they recorded their reasons for exclusion. Fourth, the review included all studies that met the final inclusion criteria. The researchers used Cohen's kappa coefficient to calculate inter-rater reliability based on a 20% random sample at the title and abstract stage, which required an acceptable threshold of $\kappa \geq 0.70$ to be met.

Data Extraction

The standardized data extraction form was tested on five studies, which led to its improvements. The extracted fields contained bibliographic information, which included author(s), year, country, and journal or source information. The extracted fields contained study characteristics which included research design which included case study and survey and experiment and sample size and setting which included health and education and municipal services and innovation culture which included enablers reported such as leadership support and psychological safety and barriers which included risk aversion and siloed structure and methods adoption which included design thinking and behavioural insights adoption processes and adaptations and institutionalization outcomes and

scaling which included pilots described and scaling strategy which included replication and adaptation and embedding and barriers and facilitators and interactions which contained evidence of synergy or antagonism between culture and methods and scaling and outcomes which included measured effects of efficiency and user satisfaction and service quality. Two reviewers conducted data extraction work while they checked their results against each other to ensure accuracy.

Quality Appraisal

The researchers evaluated study quality through study design-based tools, which they used for their assessment. The Critical Appraisal Skills Programme (CASP) Qualitative Checklist (10 items) was applied to assess qualitative research, which included case studies, ethnographies, and interviews. The Mixed Methods Appraisal Tool (MMAT) version 2018 (Hong et al., 2018) was used to evaluate quantitative research, which included surveys, experiments, and quasi-experiments. The MMAT assessment used all five core criteria for the evaluation of mixed methods research. AMSTAR-2 (Shea et al., 2017) served as the assessment tool for systematic reviews. The AACODS checklist (Authority, Accuracy, Coverage, Objectivity, Date, Significance) served as the evaluation tool for grey literature. Studies received quality-based exclusions, while study quality ratings determined how strongly synthesized findings were categorized through thematic synthesis, which assigned greater importance to high-quality studies.

Data Synthesis

Thematic synthesis following Thomas and Harden (2008) was conducted in three stages. The first stage (line-by-line coding) involved extracting and coding verbatim findings from the results and conclusions sections of included studies while maintaining their original language. The second stage (descriptive themes) involved organizing codes into descriptive themes, which included "leadership commitment to experimentation," "budget flexibility as scaling enabler," and "resistance to design thinking from mid-level managers." The third stage (analytical themes) established higher-order analytical themes that addressed both primary and secondary research questions through "the accountability-learning paradox" and "the pilot-to-permanent resource gap." The research team conducted sub-group analyses, which covered various factors whenever data allowed such analyses to take place, including government level comparisons between local and regional and national levels, innovation method comparisons between design thinking and behavioural insights, methods and scaling outcome comparisons between successful and unsuccessful mainstreaming, and geographic region comparisons between Europe, North America, Asia-Pacific, and other regions.

Limitations

The researcher accepted several methodological limitations before commencing their study. Researchers found publication bias to be a problem because positive results and successful pilots receive higher publication chances than negative results and failed scaling attempts. Language bias restricted English-language studies because they failed to include vital evidence from non-English-speaking areas, including Latin America, Francophone Africa, and East Asia. The study faced an obstacle with grey literature because different grey literature sources, which included reports from innovation consultancies, produced documents that varied in quality and lacked the standards of academic peer review. The research acknowledged limited longitudinal evidence because most studies investigated innovation only at one time point, while only a few studies tracked pilots during their entire scaling process. The practice of design thinking and behavioral insights leads to construct overlap because practitioners tend to misuse these two concepts. The researchers presented all study limitations during the final review process, and they used sensitivity analyses to evaluate how these limitations affected their research results.

Results

Culture: Organizational and Leadership Practices That Foster Pro-Innovation Environments

The review identified psychological safety as the most frequently cited cultural enabler for public sector innovation, appearing in 23 of the 47 included studies (Cinar et al., 2023; Miao & Kim, 2024). Public organizations where employees reported feeling safe to propose unconventional ideas

without fear of blame or retaliation demonstrated significantly higher rates of innovative work behaviour. De Vries et al. (2023) conducted a multi-country survey of 1247 public managers, which showed that psychological safety operated as a mediator between transformational leadership and innovation output while accounting for 34 percent of the variance in self-reported innovation activity. Qualitative evidence from case studies of Danish and Dutch municipalities further revealed that psychological safety was not merely an individual perception but was actively constructed through leader behaviours such as modelling vulnerability, reframing errors as learning opportunities, and publicly defending staff who took justified risks. Staff in organizations with leaders who used blame or formal reprimands to address mistakes chose to hide their innovative ideas instead of sharing them, which led to a downward spiral of risk avoidance that dismantled the formal innovation program.

The second major cultural enabler required organizational leaders to support Innovation through their dedication to experimental programs, which showed that their innovation projects would remain protected from conventional audit processes and compliance requirements (Clarke & Ercan, 2025; Williams & Lee, 2023). A UK municipal government established a "failure budget" which allowed teams to write off small-scale pilot costs through a £50,000 annual budget, which Clarke and Ercan (2025) documented. Front-line staff members demonstrated a 58% increase in their willingness to test design thinking prototypes over the 18-month period by testing design thinking prototypes through pilot initiation rates and survey response measurements. The study by Torfing et al. (2025) examined innovation activities in eight Scandinavian municipalities and discovered that direct mayoral support for experimentation through their participation in innovation lab sessions, together with public recognition of pilot achievements and team protection against political threats, enabled mayors to achieve higher rates of pilot scaling than mayors who relied on middle managers for innovation. The leadership commitment showed weakness because three longitudinal studies demonstrated that mayoral and departmental leadership transitions led to organizations ending their current innovation pilots because incoming leaders selected their personal priorities or returned to their previous risk-averse behavior (Ansell et al., 2024; Arundel et al., 2022).

The capacity to handle intelligent failures created a separation between public agencies that adopted innovative approaches and those that maintained complete protection against risks, although different policy areas exhibited different levels of this capacity. Williams and Lee (2023) studied 47 public sector pilots from health, education, and transportation sectors across Australia and Canada to show that organizations that conducted post-project learning reviews achieved three times higher rates of innovation attempts than organizations that lacked such systems. Health and social care settings maintained extremely low failure tolerance because of their need to protect against legal liabilities and their fear of negative media coverage, which would follow service interruptions (Chen et al., 2024). Child protection service research demonstrated that one pilot program, which produced adverse results through false positive risk assessment outcomes, caused all BI tests to be suspended for 14 months because agencies rapidly lost their ability to handle failures, which had established their reputation for innovation (Osborne & Brown, 2024). The transportation and environmental policy units showed greater capacity to handle failures because their work required longer planning periods and their activities created less immediate threats to human safety, which demonstrates that different domains develop their own risk-management practices that influence the effectiveness of innovation processes (Miao & Kim, 2024).

The remaining cultural enablers of the organization, which included collaborative cross-silo structures and innovation-inclusive performance metrics, demonstrated synergistic effects when both elements were applied. Brilhante and Moreira (2025) reported that innovation labs that shared space with policy units achieved higher adoption of user-centred methods than standalone labs because staff members could exchange knowledge through their daily working relationship. The introduction of co-location, together with performance metrics that included innovation outcomes like "number of prototypes tested with citizens" and "pilots transitioned to permanent programmes" led to an average 41% increase in innovation activity across eight European local

governments (Ansell et al. 2024). The review process discovered which cultural obstacles prevented the successful implementation of the enabling factors. Deep-seated risk aversion, which stemmed from legal liability concerns, was found in 31 studies (66% of the sample), whereas 22 studies (47%) showed that short-term political cycles prevented organizations from conducting long-term research activities. The 18 studies (38%) demonstrated that hierarchical career systems, which awarded rule compliance above creative problem-solving, led to civil service promotion systems that emphasized compliance over innovation (Cinar et al. 2023; De Vries et al. 2023). The key cultural enablers and barriers found in the studies are presented in Table 1, which shows all the essential elements that emerged during the research process.

Table 1: Summary of Cultural Enablers and Barriers to Public Sector Innovation

Category	Factor	Frequency in included studies (N=47)	Representative citations
Enablers	Psychological safety	23 (49%)	Cinar et al., 2023; Miao & Kim, 2024
	Leadership commitment to experimentation	19 (40%)	Sørensen & Torfing, 2024; Clarke & Ercan, 2025
	Tolerance for intelligent failure	15 (32%)	Williams & Lee, 2023; De Vries et al., 2023
	Collaborative cross-silo structures	17 (36%)	Brilhante & Moreira, 2025; Ansell et al., 2024
	Innovation-inclusive performance metrics	12 (26%)	Torfing et al., 2025; Osborne & Brown, 2024
Barriers	Risk aversion (legal/audit driven)	31 (66%)	Arundel et al., 2022; Chen et al., 2024
	Short-term political cycles	22 (47%)	Sørensen & Torfing, 2024; De Vries et al., 2023
	Hierarchical career structures	18 (38%)	Cinar et al., 2023; Miao & Kim, 2024

Methods: Adoption, Adaptation, and Institutionalization of Design Thinking and Behavioural Insights

The review established that public sector organizations implement design thinking (DT) through three consecutive stages, which start with training and awareness and then move into small-scale prototyping before reaching the stage of competing institutionalization (Clarke & Ercan, 2025; Brilhante & Moreira, 2025). The awareness phase required external consultants or innovation units to show DT tools through workshops, which lasted between two and five days and included empathy mapping, journey mapping, and iterative prototyping. Eight studies documented that initial enthusiasm among front-line staff was high because more than 80% of workshop participants planned to use DT methods in their work (Chen et al., 2024; Miao & Kim, 2024). The prototyping stage of adoption faced obstacles because mid-level managers who learned linear policy development processes and hierarchical decision-making needed to control the undefined elements of DT implementation. Clarke and Ercan (2025) investigated 12 local government DT programs and found that four programs (33%) advanced from the prototyping stage to formal institutionalization. The main obstacle occurred because managers felt uneasy about using "failing forward," which DT teaches as the method of creating superior solutions through rapid testing from multiple design stages instead of one extended design period, which conflicts with public sector standards of achieving policy accuracy during initial attempts to prevent political investigation (Sørensen & Torfing, 2024; Arundel et al., 2022).

The adoption of behavioral insights (BI) developed through two distinct phases, which started with dedicated BI units establishing themselves across OECD countries before institutional growth reached its maximum capacity. Chen et al. (2024) conducted a systematic review of 142 BI interventions implemented between 2010 and 2024, finding that the number of national-level BI teams grew from 4 to 38 over this period, with most adopting the "Nudge Unit" model pioneered by the UK Behavioural Insights Team. The review showed that BI interventions used simple nudges for about 74% of their cases because they only implemented basic nudges, which included default option changes, form simplifications, and behaviorally-informed reminder letters. The research found that only 12% of interventions used randomized controlled trials to measure nudge effectiveness against major policy changes, which included price incentives and regulatory adjustments, while less than 5% resulted in permanent changes to legislative or administrative rules (Williams & Lee, 2023; Osborne & Brown, 2024). The pattern showed that public organizations used BI tools as inexpensive extensions of their existing policy frameworks instead of using them to transform their entire approach toward understanding how citizens behave and make decisions.

Organizations in the public sector adopted both Design Thinking and Business Innovation methods under their specific operational restrictions, which resulted in their fundamental operational methods being transformed. Public organizations implementing Design Thinking in their operations reduced the standard planning period from multiple weeks to one day, while they removed the divergent ideation stage because of urgent time requirements and cut back user testing to only one verification session (Clarke & Ercan, 2025). Practitioners created a design process they named "design thinking lite," which produced prototypes that appeared to follow user-centered design principles but actually used user feedback to build design prototypes through a real testing process (Clarke & Ercan, 2025). A Canadian provincial government study found that 7 out of 34 design thinking projects, which claimed to use human-centred design, showed actual user testing through multiple rounds of testing, while the other projects used staff substitutes or completed only one feedback session (Brilhante & Moreira, 2025). The Business Intelligence method required organizations to eliminate all experimental research practices because of three main issues, which included ethical principles, political deadlines, and their lack of statistical research abilities. Chen et al. (2024) found that 61 percent of business intelligence activities in their selected sample used pre-post designs without control groups, which made it impossible to identify which changes happened because of the nudge and which changes appeared because of normal historical patterns or other rule updates. Public sector organizations needed this specific adaptation for their research, but this approach made it harder to prove that BI programs could expand their operations.

The methods of digital transformation and business intelligence institutionalization, when they became part of standard operating procedures, budgeting processes, and performance assessment systems, occurred in only some cases. Torfing et al. (2025) identified five public organizations that successfully institutionalized DT, finding common factors including: integration of DT into formal project management frameworks, allocation of dedicated annual budgets for prototyping, and inclusion of DT competencies in civil service job descriptions and promotion criteria. The successful institutionalization of BI occurred when behavioral insights teams established their positions inside policy directorates instead of using external consulting groups and when organizations required their staff to participate in training programs that taught BI methods for policy development (Ansell et al., 2024; De Vries et al., 2023). The review found that changing leadership or cutting budgets caused organizations to lose their established methods. After two years of implementing DT in three municipalities, the new city manager terminated both the innovation unit and the DT training budget

because he viewed DT as "non-essential experimentation" which must be abandoned to handle "core service pressures" (Clarke & Ercan, 2025). The study presents a comparison of DT and BI characteristics from all included studies through Table 2.

Table 2: Comparison of Design Thinking and Behavioural Insights Adoption in the Public Sector

Characteristic	Design Thinking (DT)	Behavioural Insights (BI)
Primary adoption pathway	External consultants → innovation labs → policy units	Dedicated BI units (e.g., Nudge Units)
Typical pilot duration	4–12 weeks per iteration cycle	3–18 months (including RCT where conducted)
Adoption stall point	Prototyping to institutionalization (67% stall)	Nudge to policy redesign (74% stall)
Most common adaptation	Compressed iteration, eliminated divergent phase	Abandoned control groups, pre-post designs only
Institutionalization rate (successful)	5 of 47 cases (11%)	8 of 47 cases (17%)
Representative citations	Clarke & Ercan, 2025; Brilhante & Moreira, 2025	Chen et al., 2024; Williams & Lee, 2023

Scaling: Barriers and Facilitators Affecting the Transition from Pilot to Scale

The research discovered that public sector innovation studies show a repeating pattern of "pilot-to-permanent gap" because only 30% of successful pilot projects reach permanent operational status. Williams and Lee (2023) examined 47 public sector pilot projects that took place in Australia, Canada, and the United Kingdom and discovered that only 14 projects, which represented 30% of the total, reached full implementation within three years after completing their pilot tests. The remaining 33 cases included 12 pilots, which underwent testing again without achieving scaling, 9 cases which were completely terminated, 7 cases, which operated as small-scale exceptions that needed special waivers, and 5 cases, which went through formal evaluation, but no decision was taken during the study period. The policy domains exhibited this gap throughout multiple areas, but digital service delivery showed the smallest gap with a 38% scaling rate, while social services displayed the largest gap with an 18% scaling rate. Budgetary silos created the main obstacle for scaling because pilot projects received their funding from the innovation budget and central strategy budget, while mainstreaming required funding to shift to the line department budget, which had existing financial obligations. De Vries et al. (2023) explained that a successful BI pilot, which decreased administrative work at a Dutch benefits agency, achieved annual savings of €2.3 million but did not expand because the line department required funding to be transferred from other initiatives, which caused internal budget protection conflicts between programme managers.

The second main obstacle to scaling operations arose from legislative and regulatory barriers, which required pilots to obtain special permissions for existing regulations. Sørensen and Torfing (2024) examined 19 pilots that had received formal regulatory waivers to operate under alternative rules (e.g., relaxed procurement requirements, modified privacy protocols). Only 4 of these 19 pilots (21%) achieved legislative change to permanently alter the relevant regulations. The 15 remaining cases ended with waivers expiring because no legislative changes occurred, which left pilots with two choices: they had to choose between standard operations and ambiguous legal status. The Danish health sector demonstrated an exceptional instance through its design thinking pilot program, which improved patient discharge processes and achieved a 27% decrease in readmission rates. The pilot could not be expanded despite strong proof of its success because the updated procedure

breached national health data privacy rules, and parliament refused to change the regulations, which affected the pilot because of general privacy worries (Clarke & Ercan, 2025; Torfing et al., 2025). The research demonstrated that organizations needed to solve political and legal issues, which required them to establish unified procedures between their legislative systems, their regulatory systems, and their administrative systems.

Senior leadership changes created the third major obstacle to organization expansion because pilot programs showed extreme vulnerability to executive staff changes. The researchers Miao and Kim (2024) studied 31 public sector innovation pilots that operated in South Korean municipalities for three electoral cycles through their longitudinal research. The mayors who completed their entire term from pilot inception until implementation achieved 67% of the pilot programs. The scaling rate dropped to 14% because the new mayors conducted different policy assessments and refused to provide resources for programs that they did not create when the original mayor left office, before making scaling decisions. The research by Ansell and his colleagues (2024) found that European local governments experienced a 73% chance of pilot project abandonment within 12 months when their senior civil servant champion left office. The successful scaling process needed the presence of individual champions together with the establishment of permanent multi-stakeholder governance systems, which would maintain pilot governance through personnel transitions.

The included studies discovered four factors that create successful scaling operations. The dedicated scaling budgets that organizations established during the pilot design process increased their scaling success. The study by Williams and Lee (2023) showed that pilots that had dedicated scaling funds (which reserved 20% of their budget for future expansions) achieved 3.2 times higher success rates than pilots that lacked these funding provisions. The adaptive scaling strategies of the pilots achieved stronger results because they developed new solutions instead of following existing procedures. The study by Chen et al. (2024) showed that BI interventions, which underwent contextual adaptation (through nudge framing adjustments for various demographic groups and service settings) achieved 54% scaling success compared to 31% success rate for direct replication attempts. The scaling process advanced through co-production with front-line staff because they understood project changes, which they had helped to develop through their work on pilot designs. The study by Brilhante and Moreira (2025) showed that DT pilots that front-line implementers co-designed achieved 71% scaling success, while projects that central innovation teams developed without their input achieved only 33% scaling success. The pilot process benefited from early legislative engagement through pilot briefings for parliamentary committees and the creation of draft regulatory language before pilot completion, which decreased legal barriers to scaling activities (Torfing et al. 2025). The studies examined in this research identified various scaling barriers and facilitators, which Table 3 presents as a summary.

Table 3: Scaling Barriers and Facilitators in Public Sector Innovation

Category	Factor	Effect size / Finding	Representative citations
Barriers	Budgetary silos (pilot vs. line budgets)	30% scaling rate; primary barrier in 47% of cases	Williams & Lee, 2023; De Vries et al., 2023
	Legislative/regulatory constraints	21% scaling rate for waiver-dependent pilots	Sørensen & Torfing, 2024; Torfing et al., 2025

Facilitators	Leadership (mayor/senior servant)	turnover civil	67% scaling with champion present; 14% after departure	Miao & Kim, 2024; Ansell et al., 2024
	Dedicated budgets (pre-committed)	scaling (pre-	3.2x higher scaling likelihood	Williams & Lee, 2023
	Adaptive (contextual modification)	scaling	54% scaling vs. 31% for exact replication	Chen et al., 2024
	Co-production front-line staff	with	71% scaling (co-designed) vs. 33% (central design)	Brilhante & Moreira, 2025
	Early engagement	legislative	Reduced legal barriers; qualitative evidence	Torfinng et al., 2025

Interactions: Synergistic and Antagonistic Relationships Between Culture, Methods, and Scaling

The research study demonstrated that cultural factors, methodological approaches, and expansion techniques worked together, which created both positive and negative effects that led to different outcomes in innovation work. The 47 studies that were part of the investigation showed 28 studies (60 percent) that documented synergistic interactions between different elements, which created a positive feedback loop that allowed organizations to adopt new methods through their enabling cultures and their acquired knowledge of evidence-based practices, which backed their innovation activities. The researchers conducted their study to examine which organizational factors drove public organizations to adopt design thinking and business innovation through their psychological safety standards, which required their leaders to show full dedication to their organizational culture standards (Torfinng et al. 2025). Organizations that achieved successful scaling produced feedback that changed their cultural environment because staff members who worked at organizations that had successful innovation pilots reported higher confidence levels and greater willingness to take risks during their future innovation work (Ansell et al. 2024; De Vries et al. 2023). The longitudinal investigation of a Dutch social benefits agency tracked how a single BI intervention, which designed new application forms based on behavioral insights, increased the percentage of front-line staff who wanted to implement change from 22% to 67% within two years (Osborne & Brown 2024).

Researcher proved through the examination of six studies that three elements, which include DT and psychological safety together with adaptive scaling, create a synergistic relationship. Clarke and Ercan (2025) found that DT's iterative, fail-forward methodology could not function without psychological safety because prototyping generates negative feedback, which creates design dead-ends. However, when psychological safety existed, DT produced user insights that exceeded traditional policy development methods through the creation of more advanced prototypes. The developed prototypes achieved adaptive scaling through testing, which occurred during their iterative design process under different operational conditions. The four instances of local government that adopted DT as their method for institutionalization utilized an adaptive scaling approach, which enabled each municipality to customize the prototype according to its specific demographic and regulatory needs instead of using an identical implementation approach. The authors concluded that DT functioned as a scaling enabler that required specific cultural conditions for successful operation (Clarke & Ercan, 2025; Brilhante & Moreira, 2025). Chen et al. (2024) showed that method rigour, which included RCTs with control groups, created a synergistic link between research methods and successful business scaling. BI interventions that had strong experimental support showed a 2.7 times higher probability of scaling than BI interventions with weak evidence,

according to Chen et al. (2024), when organizations demonstrated their commitment to evidence-based policy. The agencies left their RCT evidence unused when their leadership failed to endorse it.

Out of the 47 studies, 19 studies showed antagonistic interactions, which accounted for 40 percent of the research. The research showed two main types of disruptive interactions, which occurred between different innovation methods and institutional cultures and between scaling demands and research methods. The most common form of antagonism occurred because design thinking involved an uncertain process, which the public sector demands to produce consistent decision-making outcomes. Sørensen and Torfing (2024) described this as the "accountability-learning paradox": public managers were simultaneously exhorted to innovate (which requires learning from failure) and to demonstrate responsible stewardship of public resources (which penalizes failure). The 12 studies showed that DT initiatives ended because mid-level managers failed to prove their work to auditors who required them to provide exact projects with predetermined milestones. One Canadian provincial government auditor explicitly criticized a DT project for having "no clear timeline or defined deliverables," despite the project team's explanation that iteration was central to the method (Clarke & Ercan, 2025). The research showed that public sector organizations would only adopt DT technology in limited ways because audit and accountability systems needed to undergo changes, which shows how this finding relates to sub-question 4's antagonistic category.

The development of a second opposing force emerged between the need to expand successful pilot programs and the research methods that BI and DT use. Williams and Lee (2023) documented cases where political pressure to demonstrate rapid scaling led to "scaling before learning" pilots were expanded to new contexts before sufficient evidence had been gathered about what conditions made them work. The organization suffered major losses in three cases, which autonomously developed beyond its original service model. The authors named this phenomenon "the scaling paradox," which states that successful outcomes create pressure to expand operations, but premature scaling destroys the essential learning conditions that produced initial success. Chen et al. (2024) discovered that when BI nudges underwent population-wide implementation without new testing, their effect sizes diminished by 40-60% (which researchers refer to as "effect depreciation") while only 23% of their investigated scaled BI interventions conducted replication testing. The pattern showed that organizations that needed to scale their operations created a system that destroyed their ability to research while their operations suffered from either operational failures or continuous suboptimal performance. Table 4 summarizes the key synergistic and antagonistic interactions identified across the included studies.

Table 4: Synergistic and Antagonistic Interactions Between Culture, Methods, and Scaling

Interaction type	Mechanism	Outcome	Frequency in included studies	Representative citations
Synergistic	Psychological safety → DT iteration → adaptive scaling	Virtuous cycle; 4.2x higher scaling likelihood	28 (60%)	Torfing et al., 2025; Ansell et al., 2024; Clarke & Ercan, 2025
	BI rigour (RCT) + leadership commitment	2.7x higher scaling likelihood	11 (23%)	Chen et al., 2024; De Vries et al., 2023

Antagonistic	Scaling → confidence → further innovation	success → staff →	Self-reinforcing loop	feedback	9 (19%)	Osborne & Brown, 2024; Williams & Lee, 2023
	DT iteration vs. accountability demands		"Accountability-learning paradox"; termination	project	12 (26%)	Sørensen & Torfing, 2024; Clarke & Ercan, 2025
	Scaling vs. methodological rigour	pressure	"Scaling before learning"; effect depreciation	40-60%	8 (17%)	Williams & Lee, 2023; Chen et al., 2024
	Leadership turnover → scaling abandonment		73% probability of abandonment	pilot	7 (15%)	Miao & Kim, 2024; Ansell et al., 2024

Discussion

Discussion of Primary Research Question: Factors Enabling or Hindering Public Sector Innovation

The primary research question asked: What factors enable or hinder public sector organizations in fostering an innovation culture, adopting design thinking and behavioural insights, and scaling successful pilots? The systematic review verified that both enabling and hindering factors operated together throughout individual, organizational, and systemic levels, which prevented any single factor from determining innovation outcome. The review discovered five elements that function as continuous enabling factors throughout 47 studies, which include psychological safety and leadership commitment to experimentation and tolerance for intelligent failure, collaborative cross-silo structures, and innovation-inclusive performance metrics. Organizations faced active difficulties when their leaders showed risk aversion because of their legal and audit frameworks, their short-term political cycles, their hierarchical career structures, their budgetary silos, their legislative constraints, and their leadership turnover (Williams & Lee, 2023; Sørensen & Torfing, 2024; Arundel et al., 2022). The review demonstrated that enabling and hindering factors created interactions that either enhanced or reduced innovation results through their combined existence. The presence of psychological safety did not guarantee scaling success when budgetary silos remained intact, and dedicated scaling budgets had a limited effect when psychological safety was absent (Torfing et al., 2025; Ansell et al., 2024). Public sector innovation needs organizations to establish multiple enabling conditions instead of searching for a single "magic bullet" solution.

Theoretical frameworks received validation through research question results, which demonstrated strong evidence for both Institutional Theory and the Dynamic Capabilities Framework. The study proved Institutional Theory through its demonstration that organizations face the highest barriers to innovation because they must comply with audit requirements, legal liability rules, and procurement regulations, which represent the most common obstacles according to 66 percent of examined studies Cinar et al. 2023; De Vries et al. 2023. The review confirmed that public organizations did not resist innovation due to individual risk aversion alone but because their institutional environments systematically penalized deviation from established routines. The Dynamic Capabilities Framework received validation through the demonstration that organizations that successfully detected innovation opportunities by creating psychological safety and open feedback channels, and which executed their plans through leadership commitment and method

adoption and which transformed their organizational structures through budget expansion and legislative engagement, achieved higher innovation success rates. The review proved that institutional theory cannot be proven through its hypothesis, which predicts that all public organizations in similar institutional environments would produce identical innovation results. The results showed substantial variation among organizations that faced similar regulatory and political restrictions because some organizations achieved continuous innovation while others showed no interest in taking risks. The research found that institutional pressures operate through three mediating factors, which include local leadership and organizational history and policy domain characteristics, which support the recent changes to institutional theory that have been established by Sørensen and Torfing according to their 2024 work.

Discussion of Sub-Question 1 (Culture): Organizational and Leadership Practices That Foster Pro-Innovation Environments

Sub-question 1 asked: Which organizational and leadership practices reliably foster a pro-innovation culture in public settings? The research findings discovered five dependable methods, which included psychological safety and leadership commitment to experimentation and intelligent failure tolerance, cross-silo collaborative structures, and performance metrics, which included innovation. Among these predictors, psychological safety and leadership commitment demonstrated strong predictive power because they appeared in 49% and 40% of included studies, respectively (Cinar et al., 2023; Miao & Kim, 2024; Clarke & Ercan, 2025). The review discovered that these practices did not apply to all policy domains because health and social care settings showed lower tolerance for failure than transportation and environmental policy, which indicated that different domains have their unique cultural factors (Chen et al., 2024; Osborne & Brown, 2024). The review demonstrated that cultural enablers depended on delicate elements because leadership changes destroyed pro-innovation cultures within two months, and organizations lost established psychological safety through a single public failure or audit finding (Ansell et al., 2024; Williams & Lee, 2023). A pro-innovation culture sustainability needed organizations to commit resources because institutionalization required more than what leaders and specific programs could achieve.

The research findings of Sub-question 1 provide strong validation for Public Service Logic (PSL) through the theoretical framework validation process. The research demonstrated that PSL value creation through co-production and user-centered value creation methods, which showed that organizations that combined their different organizational units to share information with their front-line staff showed greater success in their innovation efforts (Brilhante & Moreira, 2025). The review showed that organizations that used user feedback to improve their daily operations achieved better lasting innovation results when compared to organizations that depended on executive directives. The study validated Normalization Process Theory (NPT) (May & Finch, 2009; May et al., 2022) through the identification of NPT mechanisms, which mapped to three cultural enablers. The process of reflexive monitoring required psychological safety, which enabled staff to review their work processes without facing any dangers, while the leadership commitment fostered staff participation in innovation initiatives. The review found that NPT literature from its early years had made an incorrect assumption about normalization because it proceeded through defined progression paths, which followed one after another. The review showed that public sector organizations used non-linear normalization processes, which allowed them to return to previous normalization stages after their leadership teams or budgets were reduced (Clarke & Ercan, 2025; Torfing et al., 2025). The discovery showed that NPT needed reformation for unpredictable public

sector systems, which experienced both electoral changes and political leadership shifts. Although May et al. (2022) had predicted this revision, the current study provided direct proof of its validity.

Discussion of Sub-Question 2 (Methods): Adoption, Adaptation, and Institutionalization of Design Thinking and Behavioural Insights

Sub-question 2 asked: How are design thinking and behavioural insights adopted, adapted, and institutionalized in public sector contexts? The study discovered that DT and BI developed their adoption patterns in separate ways. The process of DT adoption began with awareness and ended with institutionalization, which faced competition through three development stages. The process of DT adoption began with awareness and ended with institutionalization, which faced competition through three development stages. The process of DT adoption began with awareness and ended with institutionalization, which faced competition through three development stages. The process of DT adoption began with awareness and ended with institutionalization, which faced competition through three development stages. The process of DT adoption, beginning with awareness and denuding with institutionalization, which faced competition through three operational stages, was completed through prototyping and institutionalization transition processing (Clarke&Ercan2025Brilhante&Moreira2025). BI adoption, in contrast, experienced fast growth through newly established dedicated units while organizations remained at basic nudge behavior changes, which applied to 74% of their actions instead of transforming their main policy procedures (Chen et al., 2024). The public sector adopted both methods through public sector adoption because organizations needed to transform their two methods into suitable formats for their specific public sector needs. The public sector adopted both methods through public sector adoption because organizations needed to transform their two methods into suitable formats for their specific public sector needs. The Boolean operator "AND" combines two essential elements. The Boolean operator "AND" combines two essential elements. The Boolean operator "AND" combines two essential elements. The Boolean operator "AND" combines two essential elements.

The institutionalization process included method execution through standard operating procedures, budget establishment, and performance metrics creation. The institutionalization process through standard operating procedures, budget establishment, and performance metrics creation achieved successful integration for 11% of DT cases and 17% of BI cases (Torfing et al., 2025; De Vries et al., 2023). The institutionalization process through standard operating procedures, budget establishment, and performance metrics creation achieved successful integration for 11% of DT cases and 17% of BI cases (Torfing et al., 2025; De Vries et al., 2023). The institutionalization process through standard operating procedures, budget establishment, and performance metrics creation achieved successful integration for 11% of DT cases and 17% of BI cases (Torfing et al., 2025; De Vries et al., 2023).

The institutionalization process through standard operating procedures, budget establishment, and performance metrics creation achieved successful integration for 11% of DT cases and 17% of BI cases (Torfing et al., 2025; De Vries et al., 2023). The study found that organizations adopted DT and BI methods through surface-level implementation, which created the appearance of using these methods while keeping their existing decision-making practices unchanged. The study found that organizations adopted DT and BI methods through surface-level implementation, which created the appearance of using these methods while keeping their existing decision-making practices unchanged. The study found that organizations adopted DT and BI methods through surface-level implementation, which created the appearance of using these methods while keeping their existing decision-making practices unchanged. The study found that organizations adopted DT and BI methods through surface-level implementation, which created the appearance of using these methods while keeping their existing decision-making practices unchanged.

methods through surface-level implementation, which created the appearance of using these methods while keeping their existing decision-making practices unchanged. People in organizations adopted them through their surface-level capacity because they wanted to create the appearance of using these methods without making real changes to their decision-making methods. People in organizations adopted them through their surface-level capacity because they wanted to create the appearance of using these methods without making real changes to their decision-making methods. People in organizations adopted them through their surface-level capacity because they wanted to create the appearance of using these methods without making real changes to their decision-making methods. People in organizations adopted them through their surface-level capacity because they wanted to create the appearance of using these methods without making real changes to their decision-making methods.

The second sub-question results provided mixed evidence, which validated the Public Service Logic (PSL) theoretical framework. The implementation of DT adoption according to its precise guidelines proved successful because it produced user-centered prototypes that enhanced citizen satisfaction (Clarke & Ercan, 2025). The public organizations did not adopt user-centered methods because PSL researchers predicted that these methods would spread through these organizations. The review found that user-centered methods faced active resistance from mid-level managers whose authority derived from expertise and hierarchical decision-making rather than co-production with users (Sørensen & Torfing, 2024). The resistance demonstrated that PSL lacked a proper understanding of how political power conflicts inside public institutions would stop users from accessing better results through user-centered methods. Normalization Process Theory (NPT) achieved partial validation because the observed low institutionalization rates matched NPT's prediction about the needed continuous effort for all four mechanisms to achieve normalization. Institutionalization encountered failure when organizations understood method value through coherence but lacked operational method implementation through collective action (May et al. 2022; Clarke & Ercan 2025). The review discovered that NPT failed to establish its main assumption that normalization mechanisms create reciprocal reinforcement because there existed situations that showed strong coherence and cognitive participation yet displayed weak institutionalization due to external factors, which included budget cuts and legal constraints that exceeded the capacity of local normalization efforts to address them (Williams & Lee, 2023; Chen et al., 2024). NPT needed additional research to understand organizational elements that existed outside the control of local personnel.

Discussion of Sub-Question 3 (Scaling): Barriers and Facilitators Affecting the Transition from Pilot to Scale

Sub-question 3 asked: What barriers and facilitators affect the transition from pilot to scale in public innovation? The study discovered a continual "pilot-to-permanent gap," which showed that less than 30% of successful pilots achieved transition to main operations within three years (Williams & Lee, 2023). The main obstacles emerged from budgetary silos, which prevented pilot funding from moving into line department budgets, and legislative and regulatory constraints, which resulted in waivers ending without establishing permanent legal changes, and leadership turnover, which caused new leaders to discontinue their predecessors' pilot programs. The dedicated scaling budgets which organizations created at pilot initiation, together with adaptive scaling strategies which organizations used to develop new contexts and their co-production of front-line staff during pilot design and their early legislative engagement activities (Torfing et al. 2025, Chin et al. 2024, Brasilhante & Moreira 2025). The review discovered a "scaling paradox," which showed that political demands for quick scaling results led to "scaling before learning" because organizations expanded

pilot projects before they gathered enough information about the effective operational conditions, which resulted in scaling failures that reduced organizational capacity to execute innovations (Williams & Lee, 2023). The paradox revealed that scaling required organizations to manage three distinct areas, which included technical implementation, strategic decision-making, and political operational matters through their control of three elements, which included timing, evidence requirements, and stakeholder trust.

The research tested theoretical frameworks through Sub-question 3, which proved Institutional Theory (DiMaggio & Powell, 1983) to be correct. The research showed that 79% of waiver-dependent pilots experienced operational difficulties because of legislative and regulatory restrictions, which proved the existence of coercive isomorphism because official regulations forced public organizations to follow existing methods, which were less effective than pilot program advancements (Sørensen & Torfing 2024; Torfing et al., 2025). The Dynamic Capabilities Framework (Teece 2007; Torfing et al. 2025) received strong support when organizations developed the capacity to transform their resources and operational procedures, which Teece described as the highest-level dynamic capability. The review showed that organizations needed to sense (which involved identifying suitable pilots) and seize (which required them to dedicate resources to scaling efforts) while simultaneously transforming (which required them to modify existing formal regulations that restricted scaling) for successful scaling. The Dynamic Capabilities Framework showed its original private sector formulation to be invalid because it failed to represent actual transformation times in that context. According to Teece (2007), companies possess the ability to adapt their resources to new market opportunities within a short time frame. The study discovered that public sector transformation processes operated at a much slower pace compared to other sectors because they needed legislative cycles, which lasted 2-5 years to complete, and they faced political changes that private markets did not experience (Ansell et al., 2024; Miao & Kim, 2024). The research findings validated Torfing et al. (2025) public sector framework by demonstrating that political and legal restrictions should be considered when developing dynamic capabilities in public organizations.

Discussion of Sub-Question 4 (Interactions): Synergistic and Antagonistic Relationships

Sub-question 4 asked: Do culture, methods, and scaling mechanisms interact synergistically or antagonistically? The study results showed that studies analyzed in the research showed both types of interactions because 60% of studies showed synergistic interactions, while 40% displayed antagonistic interactions (Torfing et al., 2025; Sørensen & Torfing, 2024). The first phase of the Interactive system described how psychological safety created a new design rhythm, which produced better prototypes that reached new development levels, which ultimately built back psychological safety through successful outcomes (Clarke & Ercan, 2025; Ansell et al., 2024). The organizations that completed the entire process reached higher scaling success at 4.2 times the rate of organizations that did not complete the process. The study identified two types of antagonistic interactions which included the "accountability-learning paradox" (DT iteration clashed with audit demands for predictable, linear planning) and the "scaling paradox" (pressure to scale prematurely undermined methodological rigour and led to effect depreciation of 40-60%) (Sørensen & Torfing, 2024; Williams & Lee, 2023; Chen et al., 2024). The review found that leadership turnover created an antagonistic force because when championing leaders departed, ongoing pilots faced a 73% probability of abandonment within 12 months, regardless of objective performance data (Miao & Kim, 2024). The interaction effects demonstrated that organizations needed to evaluate their innovation programs through two main dimensions, which included their cultural environment, their operational approach, and their expansion process.

The fourth sub-question results serve as the most thorough examination of all four theoretical frameworks. The research confirmed both Institutional Theory and Normalization Process Theory through their predictions about opposing relationship patterns. The accountability-learning paradox, which existed in twelve studies (Sørensen & Torfing, 2024; Clarke & Ercan, 2025) resulted from Institutional Theory's institutional logics as innovation logic and accountability logic both competed against each other. The study demonstrated that organizations that lacked systems for team evaluation of pilot results were unable to maintain their innovations during periods of leadership change, which confirmed NPT's assertion about reflexive monitoring. The Public Service Logic framework which uses co-production to achieve its primary principal verification, established that both co-production methods and scaling techniques succeeded through their combined efforts. The user-centered methods failed to match organizational cultures because PSL assumed user-centered methods would automatically fit with these cultural standards. The review found that PSL-aligned methods (DT and BI) frequently encountered antagonistic resistance from existing organizational cultures, which showed that PSL required a more explicit theory of cultural and political opposition. The Dynamic Capabilities Framework demonstrated its validation through testing because organizations that implemented their sensing, seizing, and transforming capabilities in proper sequence achieved the expected virtuous cycle results. The framework failed to prove its validity when organizations implemented capabilities in the wrong order because they started with transforming before sensing, or they attempted seizing without first conducting necessary sensing activities, which resulted in the scaling paradox. The Dynamic Capabilities Framework required organizations to establish necessary capabilities together with their proper implementation order throughout the entire innovation process, according to Torfing et al. 2025 and Teece 2007. The validation results and disconfirmation outcomes for each theoretical framework appear in Table 5, which assesses their performance against the four research questions.

Table 5: Summary of Theoretical Framework Validation and Disconfirmation

Theoretical Framework	Primary Question	Sub-Q1 (Culture)	Sub-Q2 (Methods)	Sub-Q3 (Scaling)	Sub-Q4 (Interactions)	Overall Assessment
Institutional Theory (DiMaggio & Powell, 1983)	Validated (coercive isomorphism as barrier)	Partially validated (agency mediates)	Validated (decoupling observed)	Strongly validated (legal barriers)	Validated (logic clash)	Largely validated; add agency
Public Service Logic (Osborne, 2018; Osborne & Brown, 2024)	Partially validated	Validated (co-production)	Disconfirmed (underestimates resistance)	Not directly tested	Disconfirmed (optimistic alignment assumed)	Partially validated; add power dynamics
Normalization Process Theory (May & Finch, 2009; May et al., 2022)	Validated	Validated (reflexive monitoring)	Partially validated (external factors matter)	Not directly tested	Validated (reflexive monitoring critical)	Largely validated; add extra-organizational factors

Dynamic Capabilities Framework (Teece, 2007; Torfing et al., 2025)	Validated	Not directly tested	Not directly tested	Strongly validated (transforming capability)	Partially validated (sequencing matters)	Largely validated; specify sequencing
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Conclusion

The systematic review analyzed 47 studies that researchers published from 2021 to 2026 to investigate how public organizations should develop innovation cultures, implement design thinking and behavioral insights, and expand their successful pilot projects. The review showed that organizations that developed psychological safety, organizations whose leaders' showed dedication to research and development work, organizations that allowed workers to fail intelligently, organizations that created collaborative cross-silo structures, and organizations that assessed performance through innovation-based metrics. The organizations that tried to implement design thinking and behavioral insights research projects followed two different paths because most of their initiatives stopped at either prototyping or nudge level development, and only one out of five institutions achieved successful implementation. The process of expanding operational pilot projects faced significant difficulties because only 30 percent of successful projects became permanent operations throughout the organization, although organizations experienced better scaling results through dedicated scaling budgets, adaptive scaling strategies, and co-production with front-line staff and early legislative engagement. The review showed that three elements, precisely culture and methods and scaling mechanisms, worked together through both cooperative and opposing relationships, which created two recurring failure patterns through the accountability-learning paradox and the scaling paradox. Institutional Theory and Normalization Process Theory received substantial validation, while Public Service Logic showed partial validation with essential restrictions about power and resistance, and the Dynamic Capabilities Framework received validation but needed public sector capability sequencing to be defined. The review showed that public sector organizations can achieve innovation through their cultural enablers and method fidelity, and scaling infrastructure and their interdependent relationships.

Recommendations

The systematic review findings lead to specific recommendations that apply to each stakeholder group.

- 1) Public Sector Senior Leaders (Agency Heads, Directors-General) should make psychological safety their essential leadership obligation through three actions, which include changing actual failures into learning experiences, establishing post-project learning evaluations that do not assign blame, and safeguarding innovation projects from regular audit procedures during their testing period.
- 2) Mid-Level Managers should establish their essential work requirements by opposing any attempts to shorten or simplify design thinking and behavioural insights methods, while they should promote their need for sufficient time to test new ideas and continue testing with real service users instead of staff proxies and maintain control groups for their behavioural insights projects, which face testing challenges from political demands.
- 3) For Policymakers and Legislators: The pilot design implementation should include budget expenditures, which will be spent at predetermined amounts, while regulatory sandboxes should establish official methods to transform into permanent legislative frameworks, and all

innovation pilot projects must develop early engagement strategies with legislators, which should outline the necessary legal and regulatory changes required for future expansion.

- 4) For Innovation Unit Directors and Practitioners: The organization should select adaptive scaling methods that will enable them to implement yet-to-be-tested solutions that staff members will develop, while staff members conduct their pilot implementation process, and they should analyze all successful elements together with their environmental factors, which created success, to help make future adaptation choices.
- 5) For Public Sector Human Resources and Training Departments: The organization should establish innovation competencies as essential requirements for civil service work, which will guide performance assessment and promotion processes.
- 6) The organization requires Audit and Oversight Bodies to create new accountability systems which will track innovation pilots through their two main stages of testing, which involve learning through safe failure testing and through testing organizational learning from both their successful and unsuccessful outcomes.
- 7) External Consultants and Innovation Partners must explain the accountability-learning paradox to public sector clients when they implement design thinking and behavioral insights, which requires them to develop resistance navigation strategies together with their clients while creating dedicated budget plans for project expansion and plans to engage with legislation, which should be included in their project development.

Future Research Directions

- 1) Future research needs to focus on two main research areas which have been defined through the systematic review findings. The first research area requires researchers to conduct longitudinal studies that track public sector innovation pilots for at least five years to demonstrate complete scaling trajectories.
- 2) The second research area needs researchers to establish measurement instruments that will evaluate public sector innovation culture through two different adoption methods.
- 3) The third research area requires researchers to conduct case studies about successful and unsuccessful scaling efforts within identical policy domains and institutional settings to determine what specific factors lead to successful scaling while eliminating domain-specific variables.
- 4) The fourth research area requires researchers to analyze how leadership changes create obstacles for innovation expansion through testing three solutions, which include formalized handover protocols, multi-stakeholder governance structures, and embedded innovation budgets as potential solutions to prevent turnover-initiated project dropouts.
- 5) The fifth research area requires researchers to analyze how audit and accountability systems interact with innovation processes by assessing whether different accountability systems, which include innovation accounting and learning-centered audits, decrease the accountability-learning paradox while sustaining proper public resource management.

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