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Matrix of Innovative competencies in public administration within the ecosystem of sustainable development, national security, and financial efficiency

Matriz de competências inovadoras na administração pública no ecossistema do desenvolvimento sustentável, segurança nacional e eficiência financeira

Matriz de competencias innovadoras en la gestión pública en el ecosistema del desarrollo sostenible, la seguridad nacional y la eficiencia financiera

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The matrix offers a diagnostic and developmental tool for policymakers, educators, and managers to align innovation strategies with dynamic competency configurations across institutional and territorial contexts.
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The article formulates a theoretical and methodological concept for resolving the contradictions of "development" and "sustainability".

ABSTRACT

The dynamism of the landscape of development and security as a system leads to constant changes in the external and internal environment, including the emergence of new imperatives in the use of management tools, changes in the priority of development factors, etc., which accordingly dictate the need to find new directions for resolving contradictions. One of the most important directions in this regard is the concept of sustainable public management and the ecosystem approach in managing organizations. The article examines the features and conceptual foundations of the ecosystem approach in detail, formulating a theoretical and methodological concept for resolving the contradictions of "development" and "sustainability". The methodology combines three complementary approaches: the ecosystemic perspective, which conceptualizes innovative environments as self-organizing open systems; the pragmatic review structure, enabling a structured and purpose-driven synthesis of diverse sources; and the critical analytical lens, which interrogates underlying asymmetries in competency frameworks. It is shown that sustainable public management and administration are based on sound policies and goals that managers must diligently achieve, regardless of what the internal and external environment may dictate in some cases. A feature of the author's approach is the matrix of innovative competencies in public management, which provides for the possibility of flexible application of three paradigms of public management in the domains of sustainable development, national security, and financial efficiency.

Keywords: ecosystem approach; security; sustainability; public administration and governance.

RESUMO

O dinamismo do cenário de desenvolvimento e segurança como um sistema leva a constantes mudanças no ambiente externo e interno, incluindo o surgimento de novos imperativos no uso de ferramentas de gestão, mudanças na prioridade dos fatores de desenvolvimento etc., que, consequentemente, ditam a necessidade de encontrar novas direções para resolver contradições. Uma das direções mais importantes nesse sentido é o conceito de gestão pública sustentável e a abordagem ecossistêmica na gestão de organizações. O artigo examina as características e os fundamentos conceituais da abordagem ecossistêmica em detalhes, formulando um conceito teórico e metodológico para resolver as contradições de "desenvolvimento" e "sustentabilidade". A metodologia combina três abordagens complementares: a perspectiva ecossistêmica, que conceitua ambientes inovadores como sistemas abertos auto-organizados; a estrutura de revisão pragmática, que permite uma síntese estruturada e orientada por propósitos de diversas fontes; e a lente analítica crítica, que questiona assimetrias subjacentes em estruturas de concorrência. É demonstrado que a gestão e a administração públicas sustentáveis são baseadas em políticas e metas sólidas que os gestores devem alcançar diligentemente, independentemente do que o ambiente interno e externo possa ditar em alguns casos. Uma característica da abordagem do autor é a matriz de competências inovadoras em gestão pública, que prevê a possibilidade de aplicação flexível de três paradigmas de gestão pública nos domínios do desenvolvimento sustentável, segurança nacional e eficiência financeira.

Palavras-chave: abordagem ecossistêmica; segurança; sustentabilidade; administração pública; governança.

RESUMEN

El dinamismo del panorama del desarrollo y la seguridad como sistema conduce a constantes cambios en el entorno externo e interno, incluida la aparición de nuevos imperativos en el uso de las herramientas de gestión, cambios en la prioridad de los factores de desarrollo, etc., que, en consecuencia, dictan la necesidad de encontrar nuevas direcciones para resolver las contradicciones. Una de las orientaciones más importantes a este respecto es el concepto de gestión pública sostenible y el enfoque ecosistémico en la gestión de las organizaciones. El artículo examina en detalle las características y los fundamentos conceptuales del enfoque ecosistémico, formulando un concepto teórico y metodológico para resolver las contradicciones de «desarrollo» y «sostenibilidad». La metodología combina tres enfoques complementarios: la perspectiva ecosistémica, que conceptualiza los entornos innovadores como sistemas abiertos autoorganizados; la estructura de revisión pragmática, que permite una síntesis estructurada y orientada a objetivos de diversas fuentes; y la lente analítica crítica, que interroga las asimetrías subyacentes en los marcos de competencias. Se demuestra que la gestión y la administración públicas sostenibles se basan en políticas y objetivos sólidos que los gestores deben alcanzar con diligencia, independientemente de lo que dicte en algunos casos el entorno interno y externo. Una característica del planteamiento del autor es la matriz de competencias innovadoras en la gestión pública, que ofrece la posibilidad de aplicar con flexibilidad tres paradigmas de gestión pública en los ámbitos del desarrollo sostenible, la seguridad nacional y la eficiencia financiera.

Palabras clave: enfoque ecosistémico; seguridad; sostenibilidad; administración pública; gobernanza.

INTRODUCTION

The interdependence of internal and external threats and hazards characterizes today's complex and evolving security environment. Sustainable growth and the health of civil society can only be ensured in a safe environment. The long-term issues presented by globalization processes, military threats, poverty, social exclusion and inequality, demographic trends, environmental considerations, state and international emergencies, and careless public attitudes and behaviors all have a direct and indirect impact on security. The dynamic nature of the modern world implies that understanding the many aspects of security should go well beyond only focusing on the military. Many nations have been obliged to examine their budgets and look for ways to finance urgent problems or unanticipated operations because of emerging security risks. Budgetary restrictions or increasing defense spending, in particular, have frequently compelled several nations to reduce financing for certain civilian sectors or increase borrowing from foreign markets. Therefore, when examining the execution of sustainable development goals connected to economic, social, and environmental challenges, it is necessary to consider the numerous idiosyncrasies of national security issues. It is noteworthy that there are not much research existing in the scientific community that examines the connection between sustainability and security concerns.

A straightforward definition of sustainability could be more appropriate and relevant among the many that exist. Despite an adverse internal or external environment, it states: to sustain an operation by consistently pursuing the route of justice, progress, and balance (Kairouz et al., 2016; Gupta et al., 2024). The current situation of public administration in any nation state in the globalized world is accurately described by this term.

The necessity of looking beyond conventional definitions of security to consider issues like social inequality and exclusion, demographic shifts, unplanned and rapid urbanization, climate change, and global economic and other shocks was highlighted in British defense and security reviews and policy documents (Reveron & Mahoney-Norris, 2018). The risks presented by non-military or unconventional threats have also been mentioned. Many nations' security policies now include this new notion of security. Today, NATO specifically supports disaster relief efforts, concentrates on environmental threats to military operations and overall security, including environmental elements that impact energy supplies, and searches for innovative technologies to increase military energy efficiency. Vogler (2023) correctly asserts that climate change and environmental securitization are worldwide occurrences. The global environment in which politics is played out is radically changing due to environmental change (Dalby, 2022). As a result, it has gained significant attention on the international political scene. These developments are increasingly being viewed by policymakers as security issues.

In order to quantify the factors that contribute to political instability, the Sustainable Security Index (SSI) was created. Supported by the Polden-Puckham Charitable Foundation Trust, it offers an effort to go beyond limited conceptions of security by suggesting an integrated method for examining political instability that focuses on inclusive governance, environmental policies, and migrant flows. In order to address the causes of political instability, SSI attempts to offer a transportable early warning system that partially depends on already-existing data sources (Ozaltin, 2024; Pasichnyi et al., 2024). The score incorporates weighted sources of instability with the multifaceted concepts of sustainability and security. Thus, 168 nations were ranked using the index according to how much they contributed to world peace and stability in 2021, with special consideration given to their political, economic, and environmental governance. Accordingly, the public administration system must react on these new challenges, which, in turn, requires new competencies and new approaches.

The discipline of public management has changed dramatically in the last several decades, with an emphasis on external interactions rather than internal ones. The rise of new public management (NPM) in the 1980s was one of the most significant events driving this shift. Marketization, contracting out, corporatization, and consumer choice are some of the aspects that NPM brought to public administration. The hierarchical mindset that is connected to traditional public administration was clearly broken by this (Cavalcante & Pereira, 2022; Teixeira & Teixeira, 2023). Later, relationally and contextually focused techniques like public value management, network governance, and collaborative governance challenged NPM (Osborne et al., 2022; Pyatnychuk et al., 2024). They gave rise to a series of methods that are often categorized as new public governance (NPG) or post-NPM. NPG's focus on networks as a form of governance, stakeholder cooperation, and citizen involvement is its most distinctive characteristic.

NPM, sometimes known as "neo-Taylorism" (Pollitt, 1990), has frequently involved the application of management techniques created for private manufacturing sectors during the industrial period to public administration and services. There are a number of significant distinctions that make it difficult to transfer ideas from the commercial sector to the public sector (Osborne, 2018) (Jaakkola et al., 2019; Arivazhagan et al., 2023). Although many concepts created in the private sector may be applied in the public sector, success in this endeavor frequently necessitates extensive study, especially when it comes to the theoretical underpinnings and their implementation. This involves the creation of ecosystem-based and value-oriented theories for public sector service. The nature of public value in public service ecosystems is one of the knowledge gaps in this field (Ojasalo & Kauppinen, 2024).

The latest developments in public management that add to this continuum between business and community-oriented approaches are the result of contextual shifts brought about by technological advancement and digitalization, which have altered internal organizational procedures as well as interactions with the environment. As seen by the rise of platform economies and company ecosystems, this trend first transformed corporate life. Later, platformization, ecosystem thinking, and new technologies began to infiltrate the public sector as well. Examples of these include governance platforms (Ansell & Miura, 2020), smart city governance (Ylipulli & Luusua, 2020; Bashtannyk et al., 2024), and public sector innovation ecosystems (Carneiro et al., 2023). According to some, the ecosystem approach particularly when it comes to comprehending value co-creation better reflects the intricacies of public service delivery than NPM and the traditional network governance connected to NPG (Kinder et al., 2022, 2021; Osborne et al., 2022). Thus, ecosystem approach in sustainable development and national security implies systemic approach to public administration competencies, with at least three subsystems – sustainability, security, and resource/financial efficiency.

Sahamies and Anttiroiko (2024) look at how the ecosystem concept is really used in several areas of public management in an urban setting. The authors investigate the introduction, dissemination, and application of ecosystem thinking in a local government institution in the Finnish city of Espoo. The Espoo instance brings to light aspects (components) of the ecosystem approach in the public sector that have not been well recognized. The importance of complementary services, the presence of competitive and cooperative connections between players in public service ecosystems, and the use of digital platforms for resource orchestration are some of these components (Ortina et al., 2023). In order to successfully deploy ecosystem thinking, the study also highlights the necessity of its gradual acceptance in organizational environments. According to Sahamies and Anttiroiko's (2024) description of the Framework for the Innovation Management of Ecosystems (D3), city government is portrayed as an inventive and experimental facilitator that seeks to maximize the potential for local innovation. This illustrates a change in philosophy from welfarism to managerialism. In the D3 framework, identifying the different tasks of municipal government is crucial. Therefore, it is required of local government organizations to manage a larger ecosystem, enabling other participants to contribute to the development of public value.

In contrast to previous methods, an ecosystem-based innovation strategy values collaboration with civil society over straightforward triple-helix models and emphasizes the government's facilitative role over direct guidance (Perikangas et al., 2023; Voronina et al., 2024). Ecosystem thinking, according to Carneiro et al. (2023), provides public organizations with a comprehensive approach to comprehending system dynamics that mobilize players and resources for the cooperative development and application of public, social, and service innovations that create value for the public. This calls for assistance from public sector players, including co-production tools, techniques, and initiatives (Perikangas et al., 2023; Nekhai et al., 2024). Shared digital platforms that enable the collaboration to scale and continue beyond specific projects are one example of this (Perikangas et al., 2023).

An extensively studied application of ecosystem thinking in the public sector is public service ecosystems, or PSEs. Service ecosystems are the foundation of the PSE concept (Trischler et al., 2023; Kussainov et al., 2023). It seeks to offer a comprehensive picture of all the people and their experiences, network players and their many and fluctuating roles, technology, and institutional and social norms and standards that are engaged in the generation of public value (Petrescu, 2019; Poliova et al., 2024). According to Trischler et al. (2023), PSE offers a useful analytical framework for comprehending value co-creation in the context of public services at three different analytical levels of aggregation: micro, meso, and macro. However, others have pointed out that the ecosystem notion could be too nebulous to contribute value to public management if it is viewed as all-encompassing (Oh et al., 2016). In this regard, Kinder et al. (2022, 2021) claim that the ecosystem approach more accurately captures the intricacy of local services than network regulation. They contend that networks are top-down structures, while ecosystems are defined by mutual learning, trust, and the growth of collective consciousness (Kinder et al., 2021; Avedyan et al., 2023). Local governments may coordinate resources in service ecosystems, according to Carida et al. (2022), but they argue that this does not necessarily need a leadership position. The notion of focal firms aiming for a prominent place in the literature on the business and innovation ecosystem is in opposition to this (Gomes, 2018).

Given that ecosystems have been suggested as an alternative to networks in the theoretical framework of public service management, it is significant to observe that many of the features offered as defining characteristics of PSEs have notable similarities with the theorizations of governance networks (Kinder et al., 2022; Pavlovskyi et al., 2024). For example, Krogh and Torfing (2020) contend that bottom-up, self-organizing governance networks are possible. Furthermore, networks have frequently been linked to the crucial function of trust (Rhodes, 2016) and the capacity to promote both individual and group learning (Newig et al., 2010; Gavkalova et al., 2022). The research on governance networks has also generally acknowledged the notion that different players co-create public value.

It goes without saying that properly integrating ecosystem thinking into a government agency involves more than just a horizontal procedure involving many departments. It necessitates the development of creative capabilities in public managers while also requiring political leadership and action from strategic level management.

METHODS

This study adopts a hybrid methodological framework grounded in three pillars: (i) the ecosystemic lens from Kay et al. (1999), (ii) a pragmatic, structured literature review protocol following Bichler et al. (2022), and (iii) a critical analytical posture as articulated by Dodgson (2021). Together, these approaches enable an exploration of innovative competencies not only as static attributes but as emergent properties within complex adaptive systems of learning, practice, and interaction.

First, in accordance with Kay et al. (1999), we conceptualize the innovation ecosystem as a Self-Organizing Holarchic Open (SOHO) system, composed of nested holons of competencies, institutions, and practices. This orientation departs from linear causality and embraces morphogenetic loops and propensities.

The study thus resists static taxonomies, instead applying scenario-based reasoning and acknowledging multiple developmental pathways of competencies across institutional and contextual layers. This required iterative reflection and heuristic adjustment, aligned with post-normal science principles and adaptive governance of knowledge production.

Second, the literature review follows the pragmatic and systematic guidelines of Bichler et al. (2022). The review design was constructed around the guiding questions of purpose, scope, and methodological fit. A transparent selection protocol was developed to identify peer-reviewed studies, books, and reports related to innovative competencies across sectors. A multi-phase coding strategy was applied, using concept-driven and emergent categories to extract theoretical models, definitions, and application contexts.

Finally, building on Dodgson (2021), the selected literature was not merely synthesized but subjected to a critical analysis process. This included questioning the epistemological assumptions behind frameworks, identifying gaps, contradictions, and latent power dynamics in competency discourse. This approach enhanced the rigor of the review by distinguishing between descriptive aggregation and analytical contribution, allowing us to propose an integrative model that reflects the recursive, contested, and situated nature of innovation competencies in dynamic ecosystems.

RESULTS AND DISCUSSION

Levels or layers that differentiate the roles of various participants within a service ecosystem are mentioned in the literature. According to this theory, ecosystems consist of several tiers, with the top tiers integrating the lower tiers and their agents. The individual citizen is the beneficiary at the lowest level, or the grassroots level, of a public service ecosystem. Public values must benefit more and more ultimate beneficiaries, that is, citizens at greater levels (Sydorchuk et al., 2024).

As a result, the proportion of the communal component of public value rises and the proportion of the individual component falls as one moves up the ecosystem's layers. A greater number of people's opinions should be combined to determine what is valuable. In public decision-making and communication, these assessments are in concrete form (Ojasalo & Kauppinen, 2024).

Thus, the interaction of players both within and across ecosystem levels determines the efficacy and efficiency of value co-creation in a service ecosystem. To establish network synergies in resource integration, all value offerings must be compatible (Byrkovych et al., 2023). Although the stated goals may appear to be very identical at various public service ecosystem levels, there may be significant differences in how they are implemented and prioritized.

Within Public Service Logic (PSL), the idea of public service ecosystems (PSE) has been developed as a significant viewpoint on the provision of public services. According to Petrescu (2019), it serves as a unifying framework for comprehending the intricacies of value creation and public service delivery at the individual, social, and service levels. In their discussion of public managers' contributions to value creation in public service ecosystems, Osborne et al. (2021) outline the "Appreciate–Engage–Facilitate" strategy.

The institutional, service, and individual levels of public service delivery must all be managed and governed, according to a PSE strategy. This paradigm is summed up in Fig. 1, which also provides a heuristic called "Appreciate–Engage–Facilitate" to assist the function of public managers at every level.

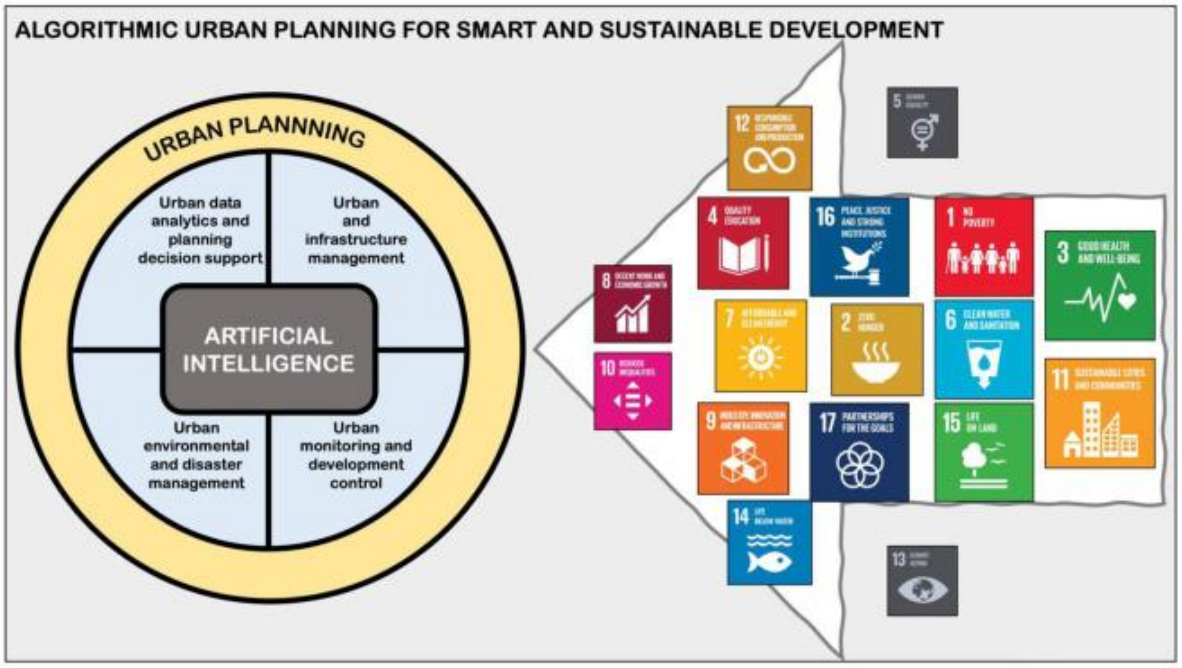
In order to improve "SDG-readiness" at all administrative levels, Meuleman (2021) identifies four major reform problems pertaining to the quality of public administration and governance (PAG), in a nexus marked by complexity, volatility, pluriformity, and unpredictability. To increase institutional capacity for achieving the SDGs, the author outlines four key areas (see Fig. 2).

Figure 1. The public service ecosystem across its three levels

Ecosystem level and its PAM core theory	Description	Governance mechanism/role of public service manager	Example of value creation (in the field of education)
Macro-level (institutional): public value	The impact of societal norms, rules and beliefs upon value creation practices (process) and the creation of public value (outcome)	APPRECIATE: the institutional level is not amenable to governance by public service managers, but it does need to be understood by them, and its import for public service delivery	Education both enacts the values that underpin a society about the role of learning within it (process) and may promote other societal values such as inclusiveness (outcome)
Meso-level (service delivery system): collaborative governance	The impact of the organizational actors, service processes, and local community on value creation (process) and the creation of organizational/service learning and improvement (outcome)	ENGAGE: this is the level that public service managers have most control over—both through resource creation/management and by the governance of public service organizational networks	A school may choose to review/reconfigure the layout of the library by co-designing it with students (process). This may subsequently enhance the learning experience, improving the service delivered by the school (outcome)
Micro-level (individual service user/stakeholder): public service logic	The impact of the individual user (and other key individual stakeholders) on value creation (process) and the creation of individual value (outcome)	FACILITATE: this is the level where individual stakeholders create/co-create value in their own lives by integrating resources (services) from the meso-level with their needs, experiences and expectations	Students bring their own life experiences into the classroom which changes the learning experience for all (process). Value is created/destroyed for the student when they engage with these resources in the context of their own life—in terms of both their learning and their future life expectations and/or experiences (outcome)

Source: Osborne et al. (2021)

Figure 2. Four priority areas to improve institutional capacity for implementing the SDGs



Source: Meuleman (2021)

Effective public governance and administration are more than just a technical issue connected to an administrative "overhead". PAG is a crucial, strategic policy issue that is connected to SDG 11 on sustainable cities and communities, SDG 17 on policy coherence for sustainable development, and SDG 16 on the caliber of public institutions.

Applying a set of principles might be the first step in making PAG a strategic priority. Eleven "principles of effective governance for sustainable development" were created in 2018 by the UN Committee of Experts on Public Administration (CEPA) and the UN Department of Economic and Social Affairs (DESA). The three requirements for institutional quality listed in SDG 16 effectiveness, accountability, and inclusivity are where the 11 principles are grouped (see Table 1). When compared to other comparable sets, such as those from the OECD or World Bank, the principles stand out since five of the eleven include the inclusion component. The principles are supported by 62 commonly used strategies. Among the strategies, some have already been published online on budget transparency, workforce diversity in the public sector, risk management frameworks, monitoring and evaluation, and coherent policymaking (UNCEPA, 2018).

Table 1. Principles of effective governance for sustainable development

Principles	
Effectiveness	1. Competence
	2. Sound Policymaking
	3. Collaboration
Accountability	4. Integrity
	5. Transparency
	6. Independent oversight
Inclusiveness	7. Leaving no one behind
	8. Non-discrimination
	9. Participation
	10. Subsidiarity
	11. Intergenerational equity

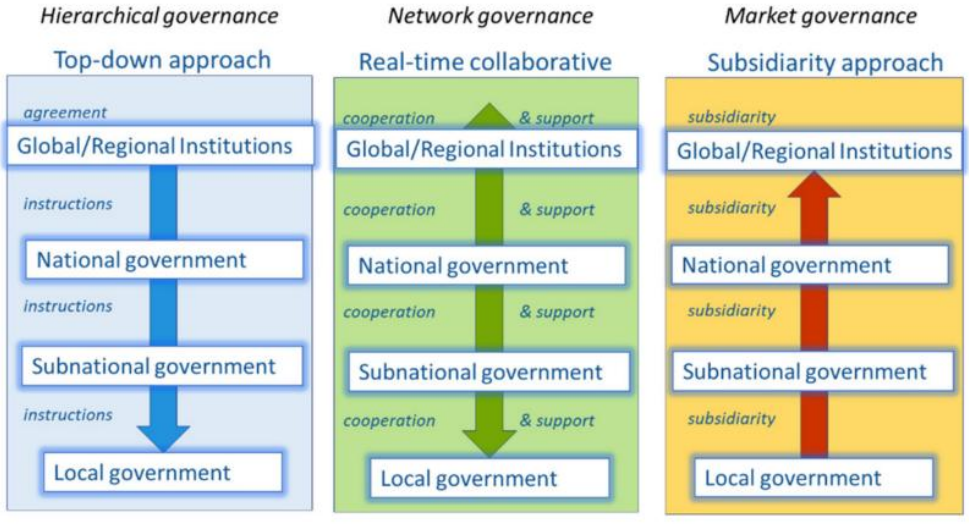
Source: UNCEPA (2018)

Rethinking institutions, tools, skills, human resources development, and governance processes at all levels is necessary to improve cooperation across political, institutional, and mental "silos" in addition to ensuring that the governance principles are correctly applied (Meuleman, 2021). This calls for improved horizontal and vertical coordination mechanisms, such as self-organizing governance institutions that try to address issues brought on by fragmented authority (Goi et al., 2023; Yermachenko et al., 2023), inclusion through co-creation and co-responsibility, and multiple leadership modalities.

Both horizontal and vertical coordination, as well as cooperation within the "whole of government" and "whole of society" concepts, would be a part of mission-oriented public sector reform. A multilevel viewpoint "dynamises the multilevel governance for SDGs" by generating fresh ideas and views for more interrelated and mutually reinforcing activities (Niestroy et al., 2019; Denysiuk et al., 2023).

In general, it might take years for a national policy to become local practice; in the EU, local authorities may only implement new laws six or seven years after the European Commission took the initiative. When creative local ideas may be elevated to larger levels, the same delay happens. But in some nations, a unique strategy known as "real-time collaborative multilevel governance" has surfaced (Meuleman, 2019; Zayats et al., 2024). Analyzing multilevel governance methods within the three fundamental governance types (hierarchical, network, and market governance) makes the rationale for include this approach evident (see Fig. 3).

Figure 3. Three views on multilevel governance



Source: Meuleman (2021)

Making public institutions more adaptable in their approach to various problem types is another issue that has to be covered in mission-oriented reform. This focuses on how to match governance and policy to the many problem categories by identifying the systems that underlie the difficulties (Gaman et al., 2022; Zilinska et al., 2022). Whether a system is complex or even chaotic, it makes a significant difference for public policy and governance if the connections between inputs and outcomes are generally obvious. These distinctions are significant for the architecture of governance and administrative structure. Table 2 presents three clearly distinct governing types.

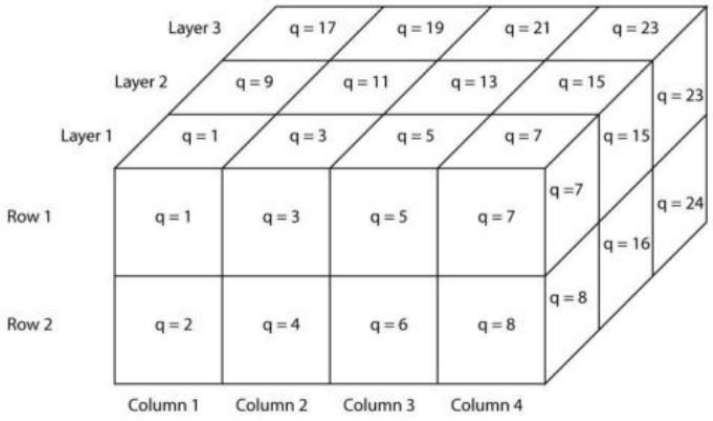
Table 2. Principles of effective governance for sustainable development

Governance Style	Example of Typical Features of the Styles
Hierarchical governance	Reasonability, consistency, legitimacy, fairness, responsibility, risk aversion, government-centered, centralized, planning and design, authoritative, directives, unidirectional communication, reliance, subordinates, compliance, rules-based, command and control
Network governance	Collaborative learning, informal agreements, trust-based, harmony, communication as conversation, process management, diplomacy, mutual dependency, mutual benefits approach, consensus, voluntary agreements, covenants, partnerships, and co-creation for innovation
Market governance	Price, marketing, decentralized, bottom-up, individualist, rational, cost-driven, adaptable, competition as a catalyst for innovation, autonomy, self-determination, empowering, contracts, incentives, rewards, and other market-based tools

Source: Compiled by the authors

It is easy to see that each style has its own, strong internal logic and purpose. Hierarchical governance is an optimal choice for efforts within the domain of national security, network governance is an excellent way in achieving SDGs, and market governance allows enabling of financial efficiency. Accordingly, competencies in public administration are "three-dimensional" and each competence represents an element in competencies matrix (see Fig. 4).

Figure 4. Three-dimensional matrix of innovative competencies in public administration



Source: suggested by the authors

Here, l = # of rows, m = # pf columns, n = # of layers, and every element q has three dimensions, acquiring a form of q_{lmn}.

In the non-linear world of sustainable security, which simultaneously integrates domains of sustainable development, national security, and financial efficiency, effective public administration should manifest the presence of this non-linear competencies' matrix, to maintain stability, resilience, and 'competitiveness' of society in the landscape of continuous change and new emerging threats.

FINAL REMARKS

Changing mindsets is a key component in preparing public administration for the 2030 Agenda. A lot of governance failures can be directly attributed to the mentality of one of the three governance styles; they are either the outcome of or a component of each style's reasoning. For instance, the logic of hierarchical governance leads to certain weaknesses, such as

the propensity to produce "red tape" (too much bureaucracy), the inability to handle complexity and uncertainty (for instance, because the concept is predicated on a precise and fixed division of labor), and the creation of opposition (for instance, because actors with significant stakes are not given due consideration). Network governance mentality can result in common shortcomings, such holding pointless conversations.

The absence of distinct lines of accountability is another frequent issue; in a multi-party process, anyone may point the finger at the others if something goes wrong. The susceptibility of network governance to manipulation is a similar problem. Many nations now have a very complicated and dispersed public sector that functions outside the direct supervision of elected politicians, despite the market governance mindset's historical goal of creating a smaller and wiser state. By putting efficiency above effectiveness, the employment of market processes in public programs has led to a loss of democratic authority over autonomous institutions. By combining these three approaches into a single matrix, it would be possible to minimize the negative effects of each and provide the synergy that is required to effectively handle national security, sustainable development, and financial efficiency.

Limitations and future research

This study is limited by its reliance on secondary sources and conceptual synthesis, which, while offering a broad and integrative view, may lack the contextual specificity derived from primary empirical data. The matrix, though analytically grounded, remains a heuristic model requiring further validation across diverse organizational and territorial settings. Moreover, the dynamic and relational nature of innovative competencies may be oversimplified in typological representations. Future research should engage in longitudinal, multi-scalar studies that explore how these competencies are enacted, contested, and transformed within specific ecosystems, especially in underrepresented regions and sectors. Mixed-method approaches combining ethnographic depth with systems mapping could enrich the model's explanatory power and practical relevance.

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B. data research and statistical analysis:	16.6%	16.6%	16.6%	16.6%	16.6%	16.6%
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