

THE ROLE OF INVESTMENTS IN DIGITALIZATION AND FACILITATING COOPERATION BETWEEN THE PRIVATE AND PUBLIC SECTORS

SĂNDULESCU SIMONA SORINELA
BUCHAREST UNIVERSITY OF ECONOMIC STUDIES
e-mail: sandulescusimona18@stud.ase.ro

STATIVĂ GHEORGHE ALEXANDRU
BUCHAREST UNIVERSITY OF ECONOMIC STUDIES
e-mail: alexstativa95@gmail.com

Abstract

This paper analyzes the strategic role of digitalization investments in facilitating public-private collaboration, taking as a starting point the transformations generated by new technologies on governance, economic processes, and institutional relations. Through a comprehensive analysis of the specialized literature, case studies and conceptual models, the article highlights how digitalization improves transparency, administrative efficiency, systems interoperability, and innovation in public-private partnerships. The results show that investments in digital infrastructure, interoperability and skills are essential for the development of sustainable and high-performance cooperation.

Keywords: digitalization, investment, cooperation

Clasificare JEL: O1, R53

1. Introduction and context of the study

In the last two decades, digital transformation has become one of the main factors shaping economic development, the competitiveness of nations and the way institutions interact with each other and with society. In a global context characterized by increasing volumes of data, accelerating technological progress and the pressure to make public services more efficient, investments in digitalization are no longer an option but a strategic necessity (Ciancarini et al., 2024). Digitalization is redefining the role of the state, the dynamics of markets and public-private relations, radically transforming the way public policies are designed, implemented, and evaluated (ZarZar, 2023).

In most developed countries, digitalization has become the foundation of administrative modernization, facilitating the transition from traditional bureaucratic models to intelligent, data-driven governance. This transformation not only streamlines the internal processes of public institutions, but also creates unprecedented opportunities for collaboration with the private sector. Companies, in turn, benefit from fast, transparent, and standardized interactions with the public sector, which contributes to reducing costs, increasing competitiveness, and developing new business models.

Digital transformation is currently a major structural trend, with significant effects on the functioning of public institutions, on the way economic actors operate and on the forms of collaboration between the public and private sectors. Investments in digital solutions, technological infrastructures and skills development can no longer be seen as simple elements of technical modernization, but constitute the basis of economic competitiveness, administrative efficiency, and the capacity of states to provide citizen-oriented services. At global and European level, the intensity of these investments reflects the fact that digitalization has become a major strategic direction of public policies and an essential tool for attracting private capital in projects of public interest. Recent data indicate an extensive use of the internet among the European population, but

the persistence of the digital skills deficit underlines the need for coordinated interventions at the level of public policies. In 2023, over 90% of EU citizens used the internet at least once a week, but only 56% had basic or higher digital skills, generating a discrepancy that highlights both the increased demand for quality digital services and the insufficiency of the skills needed to use them effectively.

Within the European Union, Romania is a relevant example of these contrasts: although the internet penetration rate is high (around 91.6% in January 2024), the indicators regarding digital human capital and the proportion of ICT specialists remain below the European average. This situation highlights the need for substantial investments in digital skills and infrastructures to facilitate the involvement of the private sector in the digitalization initiatives of the public sector. The combination of widespread internet access with unequal levels of digital skills generates both favorable premises and difficulties in developing effective collaborations between the two sectors.

Conceptually, digitalization can be considered a fundamental public infrastructure. Like transport networks or utilities, digital infrastructure – such as public cloud services, interoperable electronic registries, or digital identity platforms – produces positive externalities by reducing transaction costs, standardizing processes, and creating new business opportunities for private providers. Data publication, controlled access to it and interoperability in the digital space transform data into a strategic commons, with significant potential to stimulate private innovation, especially when the right conditions are in place regarding security, data governance, and privacy protection.

The effects of digital investments on public-private cooperation are manifested through multiple and interrelated mechanisms. First, digitalization contributes to reducing transaction costs: the automation of administrative procedures, the use of electronic forms and the centralization of procurement processes reduce the time needed for companies to comply and minimize administrative uncertainty, essential factors in decisions to participate in public projects. Second, the use of digital technologies strengthens transparency and institutional accountability: electronic registers, automated audit systems and, sometimes, blockchain technologies allow for more rigorous monitoring of the use of funds and the development of projects, increasing the trust of the private sector. Third, technological interoperability and open standards facilitate the development of common solutions and the secure exchange of data, reducing technical incompatibilities between different systems and supporting the emergence of co-innovation processes, such as living labs, regulatory sandboxes, or common testing platforms. However, the effectiveness of these mechanisms directly depends on the institutional architecture, the alignment of interests and the existence of regulatory frameworks capable of managing associated risks, such as cybersecurity or algorithmic accountability.

There are also risks and limitations that need to be considered. Capacity differences between public institutions and firms – in terms of technical skills, financial resources, and organisational culture – can influence the pace and quality of cooperation. In addition, data sharing and the use of cloud platforms raise issues of information security and digital sovereignty, which can generate reluctance on the part of the actors involved. The public financing instruments needed to facilitate private investment need to be calibrated to cover a sufficient share of the risks, without causing excessive dependencies or competitive imbalances.

These dynamics have led to the emergence and expansion of a diverse portfolio of institutional initiatives aimed at stimulating digital investments and public-private partnerships: European and national support programmes, guarantee mechanisms, dedicated funds for the development of artificial intelligence, for increasing digital skills or for cybersecurity, as well as financial instruments managed by development banks to accelerate the involvement of private capital. For example, in 2025, the European Union announced significant investments in the field of AI, cybersecurity and digital skills, and the European Investment Bank proposed large-scale financing schemes for the technology sector, aimed at mobilising private co-financing. Such

measures confirm the role of public funding as a multiplier and catalyst for private investment in sectors with high risk but with a potentially major impact on society.

The general objective of the research is to analyze how investments in digitalization influence and facilitate cooperation between the public and private sectors, identifying the mechanisms, benefits and good practices that can support the development of a sustainable collaborative ecosystem between the two sectors. This general objective was translated into three research questions:

-What is the impact of investments in digital infrastructures and platforms on collaboration between the public and private sectors?

-What are the main challenges and limitations in implementing digital investments to facilitate public-private cooperation and how can they be overcome?

-What international models and good practices can be adapted to increase the efficiency of public-private partnerships in the digital era?

2. Literature Review

The literature converges on the idea that digitalization is no longer exclusively a technological process, but a structural factor that redefines the relations between the public and private sectors. Investments in digital technologies – ICT infrastructures, data platforms, cloud solutions, artificial intelligence, and e-services – create the premises for more efficient, transparent, and flexible cooperation between institutional and economic actors (Mergel, Edelmann & Haug, 2019). In this context, digitalization is conceptualized as a catalyst for collaborative governance, facilitating the exchange of information, reducing information asymmetries, and creating public-private ecosystems based on trust and interoperability (Ansell & Gash, 2008; Meijer & Bolívar, 2016).

The concepts of e-government, digital government and smart governance are frequently associated with improving the state's capacity to interact with the private sector (OECD, 2016; Dunleavy et al., 2006). The digitalization of public services reduces transaction costs for firms, speeds up administrative processes and increases regulatory predictability, essential factors for stimulating cooperation with the private sector (World Bank, 2021). Empirical studies show that administrations that consistently invest in digital infrastructure are more attractive for public-private partnerships (PPP), especially in areas such as infrastructure, energy, health, or creative industries (Cordella & Paletti, 2019).

In the economic and public policy literature, investments in digitalization are increasingly analyzed in relation to the efficiency and sustainability of public-private partnerships. Digital platforms allow for the coordination of complex projects, performance monitoring, and risk sharing between partners (Hodge & Greve, 2017). Digital solutions also contribute to increasing transparency and accountability within PPPs, reducing the risks of opportunism and corruption, aspects frequently reported in the critical literature on public-private cooperation.

Several studies highlight the positive relationship between digitalization and the level of trust between public and private actors. Digital transparency, access to open data and the digitalization of administrative procedures contribute to reducing perceptions of arbitrariness and strengthening institutional capital. Trust is considered a key factor for long-term public-private cooperation, and investments in digitalization function as indirect mechanisms to strengthen it (Grimmelikhuijsen et al., 2013).

Although the benefits of investing in digitalization are widely recognized, the literature also points to several limitations and risks. Inequalities in digital capacity between the public and private sectors, the deficit of digital skills in administration, and cybersecurity risks can affect the quality of cross-sectoral cooperation (Kattel & Mazzucato, 2018). In addition, some studies draw attention to the risk that digitalization reinforces asymmetric power relations in favor of large private actors, especially in the context of outsourcing digital services to multinational companies.

3. Methodology

The research is exploratory and descriptive in nature, using both qualitative and comparative methods to investigate how investments in digitalization support public-private collaboration. Data collection was carried out through a literature review, analysis of reports from international organizations and government documents, as well as a comparative case study of two relevant international examples: the X-Road platform in Estonia and the GovTech initiative in the United Kingdom.

The analysis focused on identifying cooperation mechanisms, types of digital investments, degree of centralization and the effect on transparency and efficiency of public services. Comparing the two cases allowed highlighting similarities and differences, providing relevant lessons and recommendations for implementing digital investments in other contexts. The methodological approach combines qualitative content analysis with the assessment of key criteria, while recognizing the limitations generated by the major dependence on secondary sources and the lack of complete quantitative data.

4. Results and discussion

4.1 Digitalizarea sectorului public

The digitalization of government (e-government) is one of the best-studied areas of contemporary public administration. According to the specialized literature, digital transformation in the public sector involves not only the introduction of technologies, but also the reconstruction of administrative processes, changing organizational culture and implementing data-driven governance mechanisms (Clark, 2020).

The digitalization of the public sector is a broad process of institutional transformation, which is not limited to the introduction of information and communication technologies, but involves a profound rethinking of administrative procedures, organizational structures and the relationship between public authorities, citizens, and the economic environment. In the specialized literature, this evolution is described as a transition from e-government to digital governance, with an emphasis on systems integration, inter-institutional cooperation, and the provision of user-centered services.

Investments aimed at digitizing public administration focus on the development of essential digital infrastructures, such as high-speed communication networks, data centers, and government cloud solutions, as well as on the implementation of e-service platforms and interoperability mechanisms. These investments generate significant positive effects on operational efficiency, reducing administrative burden, operating costs, and the duration of decision-making processes.

A strategic role in the digitalization of the public sector is played by data and the capacity of institutions to manage and capitalize on it. Open data initiatives and the use of integrated information systems contribute to reducing information asymmetries and strengthening institutional transparency. By increasing access to relevant public information, the administration creates favorable conditions for the involvement of the private sector in the development of innovative solutions and value-added services.

At the same time, the digitalization of public administration directly influences the quality of governance and the level of trust in state institutions. The standardization and automation of administrative processes reduce the space for the manifestation of discretion and increase the predictability of public decisions, reducing the risks of inefficiency and opportunistic behavior. This more stable institutional framework stimulates the participation of private actors in joint initiatives with the public sector and facilitates the development of forms of public-private cooperation.

However, the literature highlights that the benefits of public sector digitalization depend crucially on the level of digital skills and the capacity of the administration to manage

organizational change processes. Investments in professional training, human capital development and strengthening digital leadership are necessary conditions for technological transformation to be reflected in increased institutional performance. Without them, digitalization risks producing fragmented results and having a limited impact on public-private cooperation.

Overall, the digitalization of the public sector, supported by strategic investments and coherent institutional reforms, is asserting itself as a central element of the modernization of the administration and as a determining factor in facilitating intersectoral cooperation, providing the basis for functional collaborative governance.

4.2 Public-private partnerships (PPP) in the digital age

Public-private partnerships (PPPs) are becoming increasingly complex in a digital context, and the literature examines how technology influences the structure, governance, and performance of these partnerships. According to research, digitalization has the potential to reduce information asymmetries, improve risk management, and enable continuous monitoring of project implementation (Boulghalagh et al., 2025).

In the digital age, public-private partnerships (PPPs) are undergoing a significant transformation, both in terms of their scope and operating mechanisms. While traditional PPP models were predominantly associated with the development of physical infrastructures, new forms of cooperation increasingly focus on digital infrastructures, e-services, data platforms, and advanced technological solutions. Digitalization thus extends the scope of PPPs to projects with a high degree of technological complexity and a systemic impact on public governance.

A defining element of digital PPPs is the role of technologies as a medium for coordination and integration between public and private actors. Digital platforms enable real-time information sharing, performance monitoring, and continuous adaptation of services, reducing transaction costs and risks associated with cooperation. In this context, the public sector increasingly assumes the role of orchestrator of digital ecosystems, while the private sector contributes technological skills, innovation capacity, and operational flexibility.

The literature highlights that PPPs in the digital age are closely linked to concepts such as open innovation, value co-creation, and collaborative governance. By involving private actors from the early stages of public projects, these partnerships foster the development of solutions that are better adapted to the needs of users and more cost-effective. At the same time, the use of data and digital tools facilitates the evaluation of performance and the accountability of the partners involved.

However, the implementation of digital PPPs also poses several challenges. Competence asymmetries between the public and private sectors, risks related to cybersecurity, data protection and dependence on technology providers can affect the sustainability of these partnerships. Consequently, the literature recommends strengthening the institutional capacity of the public sector, developing flexible contractual frameworks, and promoting open standards, which ensure the balance between the public interest and the economic objectives of private partners.

Overall, public-private partnerships in the digital era are emerging as strategic tools for implementing digital transformation, contributing to the modernization of public services, and strengthening cooperation between the public and private sectors, provided that an adequate institutional and regulatory framework exists. A key element identified in modern literature is digital maturity. Organizations with a high level of maturity are better prepared to collaborate with digitalized administrations, actively contributing to the development of joint solutions.

4.3 Digital transformation in the private environment

The digital transformation of companies is a central topic in management and economics literature. Studies highlight that companies that consistently invest in digitalization have a higher probability of growth, innovation and internationalization (Kruhlov, V.; et al., 2024).

Digital transformation in the private sector is a strategic process through which organizations integrate digital technologies into all areas of activity, with the aim of improving their economic performance, innovation capacity, and adaptability to market changes. Unlike the simple digitization of existing processes, digital transformation involves profound changes in business models, value chains and relationships with customers, suppliers, and institutional partners.

Investments in technologies such as artificial intelligence, big data analytics, process automation, cloud platforms, and Internet of Things solutions enable companies to optimize internal processes, reduce operational costs, and increase productivity. At the same time, these technologies facilitate the development of personalized products and services and open new opportunities for economic value creation.

The literature highlights that digital transformation enhances the ability of firms to collaborate with the public sector, by increasing interoperability, transparency, and responsiveness. Digitalized companies are better positioned to participate in complex public projects, including digital public-private partnerships.

4.4 Comparative analysis of two international models of good practice

Below are two relevant examples of good practice, frequently used in the literature and public policy documents, which clearly illustrate the role of digitalization investments in facilitating cooperation between the public and private sectors.

The UK's "GovTech" initiative

One relevant good practice example is the UK's GovTech initiative, launched to facilitate collaboration between public institutions and private technology companies, in particular SMEs and innovative start-ups. The programme relies on public investment in digital procurement platforms, cloud infrastructures and flexible institutional frameworks that enable rapid testing and scaling of digital solutions.

Through this initiative, public administrations formulate concrete public policy problems, and private companies propose adapted technological solutions. Cooperation is supported by transparent digital tools, which reduce bureaucratic barriers and ensure equal access of private actors to public contracts. This model highlights how investments in digitalization can transform the public-private relationship into a collaborative ecosystem oriented towards innovation and increasing the quality of public services.

Platforma națională de e-guvernare din Estonia (X-Road)

One of the most cited international examples of good practice in digitalizing public administration and cooperating with the private sector is the Estonian e-government model, centered on the X-Road digital infrastructure. This is an interoperable platform that enables secure data exchange between public institutions and private actors, such as banks, utility companies, IT service providers, and non-governmental organizations.

Initial public investments in digital infrastructure, cybersecurity and electronic identity have created the premises for the active involvement of the private sector in the provision and development of digital services. Thus, many public services (company registration, tax reporting, access to banking or healthcare) are provided through solutions developed in public-private partnership. The Estonian model demonstrates that digitalization not only makes administration

more efficient, but also stimulates innovation, reduces transaction costs, and strengthens trust between the public and private sectors.

There are various similarities and differences between the two initiatives presented.

From the point of view of the strategic role of public investments in digitalization, both initiatives rely on substantial public investments in digital infrastructures (interoperable platforms, government cloud, cybersecurity), which function as essential public goods and catalyze private sector involvement.

In terms of facilitating public-private cooperation through digital platforms, both X-Road and GovTech use digital platforms as the main connection mechanism between public institutions and private actors, reducing administrative barriers and transaction costs.

From the point of view of efficiency and innovation orientation, both models aim to increase administrative efficiency and stimulate innovation, through outsourcing or co-creating digital solutions together with the private sector.

In terms of increasing transparency and institutional trust, the digitalization of processes and the standardization of data exchange contribute, in both cases, to increased transparency, predictability and strengthening trust between the public and private sectors.

From the perspective of the nature of digital investments, the Estonian model is focused on investments in basic digital infrastructure (e-identity, interoperability, digital registries), with cross-cutting applicability across the entire state. In contrast, the UK GovTech focuses on investments oriented towards specific and experimental solutions, adapted to concrete public policy problems.

In terms of the type of public-private cooperation, in Estonia, public-private cooperation is structural and long-term, with private actors being permanently integrated into the national digital ecosystem. In the United Kingdom, cooperation is more flexible and competitive, based on projects, quick tenders, and pilots, with a focus on start-ups and innovative SMEs.

In terms of the degree of centralization, X-Road operates in a highly centralized and standardized system, in which the state defines the unitary digital architecture. GovTech operates in a more decentralized framework, in which individual public institutions formulate their needs and solutions are developed contextually.

From the perspective of the maturity of the digital ecosystem, Estonia represents a model of advanced maturity of public sector digitalization, where public-private cooperation is already institutionalized. The GovTech initiative rather reflects an evolutionary approach, focused on adaptability, testing and incremental learning.

5. Conclusions

The analysis highlights the strategic role of digitalization investments in facilitating cooperation between the public and private sectors. Digital platforms and technological infrastructures not only increase the efficiency of public services, but also allow for the creation of a sustainable collaboration framework between the state and the private sector, reducing bureaucratic barriers and stimulating innovation. Public-private partnerships are efficient mechanisms in this regard, offering mutual benefits: public administrations provide the infrastructure and institutional framework, while private actors contribute technological skills and innovative solutions. Comparing international models, such as the X-Road platform in Estonia and the GovTech initiative in the United Kingdom, highlights that digitalization can support both centralized and integrated models and flexible, project-oriented approaches, depending on the institutional context and the level of digital maturity. In addition, enhanced digitalization contributes to increasing transparency, predictability, and trust between the public and private sectors, underpinning a sustainable collaborative ecosystem.

Despite these conclusions, the research has some important limitations. The analysis focused mainly on international examples, which may limit direct applicability to other national or regional contexts. The methodology, based mainly on case studies and qualitative analyses, does not provide

comprehensive quantitative data on the performance of digital investments or comparable indicators of public–private cooperation. Digitalization and digital ecosystems are also evolving rapidly, which may affect the relevance of the conclusions over time. The cultural, political, and economic factors influencing public–private cooperation have not been comprehensively analyzed, which limits the generalizability of the results.

In the future, research could be extended by investigating models of digitalization and public–private partnerships in national and regional contexts, to identify local good practices and validate the relevance of international findings. The development of comparable indicators and metrics is recommended to assess the impact of digital investments on administrative efficiency, service quality, and collaboration with the private sector. Longitudinal studies could track the evolution of digital projects and public–private partnerships over the long term, to assess their sustainability and adaptability in the context of technological and legislative changes. In addition, future research could analyze how start-ups, emerging technologies (AI, blockchain, IoT) and digital incubators can facilitate new forms of cooperation, as well as the indirect effects of digitalization on transparency, citizen participation, digital inclusion, and local economic competitiveness.

6. References

- [1] Ansell, C., & Gash, A. (2008). *Collaborative governance in theory and practice*. Journal of Public Administration Research and Theory.
- [2] Boulghalagh, M., et al., *Public-private partnerships as catalysts for smart cities: co-developing digital infrastructure and real-time data systems*. *European Journal of Economics, Finance and Administrative Sciences*, 2025
- [3] Ciancarini, Paolo; Giancarlo, Raffaele; Grimaudo, Gennaro *Digital Transformation in the Public Administrations: A Guided Tour for Computer Scientists*. IEEE Access, 2024.
- [4] Clark, Jennifer J., *Uneven Innovation: The Work of Smart Cities*. Columbia University Press, 2020. (abordează critic dezvoltarea smart cities și inegalitățile generate de digitalizare)
- [5] Cordella, A., & Paletti, A. (2019). *Digital government and public value*. Government Information Quarterly.
- [6] Dunleavy, P. et al. (2006). *New public management is dead—long live digital-era governance*. Journal of Public Administration Research and Theory.
- [7] Grimmelikhuijsen, S. et al. (2013). *The effect of transparency on trust*. Public Administration Review.
- [8] Hodge, G., & Greve, C. (2017). *On public–private partnership performance*. Public Works Management & Policy.
- [9] Kattel, R., & Mazzucato, M. (2018). *Mission-oriented innovation policy*. Industrial and Corporate Change.
- [10] Kruhlov, V.; et al. *Revitalizing Ukrainian Cities: The Role of Public-Private Partnerships in Smart Infrastructure Restoration*. CEPAR – Central and Eastern Europe Public Administration Review, 2024
- [11] Mergel, I., Edelman, N., & Haug, N. (2019). *Defining digital transformation*. Government Information Quarterly.
- [12] OECD (2016). *Digital Government Strategies for Transforming Public Services*. World Bank (2021). *GovTech Maturity Index*.
- [13] ZarZar, M. *Impact of Digital Technology on Public–Private Partnership*. AIP Conference Proceedings, 2023