Scientific Center of Innovative Research OÜ

ECONOMICS, FINANCE AND MANAGEMENT REVIEW (EFMR)

Issue 1 (21)

2025

e-ISSN 2674-5208
print-ISSN 2733-2101
DOI: 10.36690/2674-5208-2025-1

International databases and directories indexing publications:

- CrossRef (DOI: 10.36690);
- ISSN International Centre;
- Google Scholar;
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Economics, Finance and Management Review. DOI: 10.36690/2674-5208-2025-1

The seventeenth issue contains articles by scientists from different countries, prepared based on their scientific work. It is designed for university teachers, graduate students, undergraduates, practitioners in economics, finance, accounting, and auditing, as well as other branches of economics.

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CONTENT

DIGITAL TRANSFORMATION OF SOCIAL GOVERNANCE: ECONOMIC CHALLENGES AND OPPORTUNITIES OF SMART CITIES

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Citation:
Kutkov, O., Zolotov, A., Akimova, L., & Akimov, O. (2025). Digital Transformation of Social Governance: Economic Challenges and Opportunities of Smart Cities. *Economics, Finance and Management Review*, (1(21), 17–28.
https://doi.org/10.36690/2674-5208-2025-1-17-28

Received: March 12, 2025
Approved: March 29, 2025
Published: March 31, 2025

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Abstract. *The increasing integration of digital technologies into public administration has led to a reconfiguration of how social services are managed in urban environments. This study focuses on the economic dimensions of digital transformation in the social sector within the framework of smart cities. The relevance of the topic stems from the growing demand for cost-efficient, transparent, and inclusive public service delivery in the face of rapid technological advancement and societal expectations for digital equity. The research aims to explore the extent to which these innovations contribute to efficiency improvements and what challenges hinder their successful implementation in the governance of education, healthcare, and social protection. The study employed an empirical methodology based on structured sociological surveying, utilizing remote digital tools for data collection. A representative sample of respondents was selected according to demographic, educational, and territorial criteria, enabling an inclusive and statistically relevant dataset. Data were processed through statistical and content analysis methods, allowing both quantitative and interpretive insights into the dynamics of digital service adoption, accessibility, and institutional readiness. The results reveal several critical trends. First, digital services in the social sector are perceived as beneficial, especially in terms of convenience and speed, but they are not yet universally accessible. Infrastructure limitations and disparities in digital literacy remain persistent barriers to equitable service delivery. Second, public trust in artificial intelligence, particularly in automated decision-making related to welfare and benefits, is cautious and highly dependent on context. Many individuals express concerns over transparency, data security, and the ethical dimensions of automation. Third, financial constraints and organizational inertia within local administrations significantly hinder the rollout of smart city technologies, despite their potential for long-term economic benefits. At the same time, the emergence of new models of budgeting, public-private partnerships, and performance-based planning shows promise in bridging the gap between innovation and sustainability. Ultimately, the study demonstrates that while the digital transformation of social governance offers substantial economic opportunities, its success depends on inclusive policy design, public engagement, and the capacity of institutions to adapt to change.*

Keywords: *smart city; digital transformation; artificial intelligence; social sphere; public administration; digital services; trust in AI; digital inequality; sociological survey; economic dimensions; economic challenges; economic benefits; economic efficiency.*

JEL Classification: H83, I38, O33, R58, C83

Formulas: 0; fig.: 7; table: 2; bibl.: 8

Introduction. The digital transformation of urban governance has redefined the landscape of public administration, particularly in the social sector. The integration of artificial intelligence (AI), data analytics, and smart infrastructure into city systems is no longer a distant ambition but an operational reality. In smart cities, technological innovation intersects with social needs, shaping new models for delivering public services, engaging citizens, and allocating resources. As cities become more interconnected and data-driven, the social sphere - comprising healthcare, education, social protection, and civic engagement - stands at the forefront of this transformation.

In the Ukrainian context, where digitalization efforts are compounded by the challenges of post-war recovery and decentralization, the role of smart city technologies in social governance is both urgent and complex. However, there remains limited empirical evidence on the economic impact, social equity outcomes, and public trust associated with these digital reforms. This study addresses this gap by analyzing the extent to which AI and digital platforms influence the economic efficiency, accessibility, and public perception of social services in Ukrainian municipalities.

Literature review. In contemporary academic discourse, the concept of the smart city is viewed as a key direction in the modernization of urban governance and the digital transformation of social infrastructure. Significant attention to this topic is given by A. Andriyenko, who in his monograph explores the process of implementing Smart City approaches in the governance of major Ukrainian cities. The author emphasizes the necessity of digitally rethinking urban functions, including transport, energy, social services, and communication with citizens. The smart city concept is presented as a response to the challenges of decentralization, urbanization, and institutional modernization (Andriyenko, 2023). However, the economic effects of implementing such models remain underexplored - particularly questions concerning the financing of digital innovations, the cost-effectiveness of governance reforms, and the economic balance between public and private sectors in the delivery of social services.

The study by M. Habrel, M. Kosmii, and M. Habrel focuses on the intangible dimensions of smart cities - such as social capital, trust, and inclusion. The authors argue that the digitalization of the urban environment must take into account not only infrastructural, but also humanistic aspects: identity, citizen participation in decision-making, and ethical standards in the use of technologies. This is especially relevant in the context of post-war reconstruction, where social cohesion is no less important than technical modernization (Habrel, Kosmii, Habrel, 2024). At the same time, an important question arises: how can the economic impact of social inclusion, digital trust, and civic engagement in governance be measured in terms of municipal budgets and investment returns?

K. Kraus, N. Kraus, and O. Marchenko examine the impact of digital transformation on the inclusivity of the urban environment, particularly through the lens of universal design. Their work emphasizes that access to digital services must account for the needs of persons with disabilities, older adults, and other vulnerable groups. This approach directly correlates with the challenges of digital inequality identified in our empirical research (Kraus, Kraus, Marchenko, 2022). However, an open question remains: to what extent do these inclusive considerations improve the economic efficiency of public governance and reduce long-term expenditures on social

support?

A broader urban perspective is offered in the monograph by K. Mezentsev, Ya. Oliinyk, and N. Mezentseva, which analyzes spatial transformations in Ukraine. The authors stress the growing role of medium and large cities as both centers of digital innovation and hotspots of social tension. They consider digitalization as a tool for managing urban complexity, particularly under conditions of wartime and postwar change (Mezentsev, Oliinyk, Mezentseva, 2017). This raises important economic questions: what are the financial costs borne by municipalities in implementing innovations, which sources of funding are most sustainable, and how do digital solutions affect the labor market within the social sector?

In an international context, the OECD report (OECD, 2023) examines the potential of AI in social governance, presenting cases of its application in healthcare systems, social welfare, and the forecasting of citizen needs. Particular attention is given to challenges related to ethics, algorithmic transparency, and data protection — aspects that are of key importance in light of our survey results, which revealed moderate levels of trust in automated decision-making systems. Yet, economic risks of automation in social governance also deserve attention: potential job losses in the public service sector, the threat of digital monopolization, and the high costs of constantly updating technological infrastructure.

Finally, the article by O. Zakharova and M. Kozyriev offers an interpretation of the smart city concept as an alternative approach to rebuilding Ukraine's urban infrastructure in the postwar period. The authors stress the importance of a strategic vision for digital development tailored to Ukrainian realities and emphasize citizen engagement as an essential component of urban governance (Zakharova, Kozyriev, 2022). In this context, the issue of economic planning for digital reforms becomes especially relevant: what is the optimal balance between the costs of digital modernization and the anticipated socio-economic benefits for communities?

Thus, the reviewed sources reveal the complex and multidimensional nature of the smart city phenomenon, in which technology intersects with social, political, cultural, and economic processes. An interdisciplinary approach not only outlines the technical dimensions of digital transformation but also enables a more comprehensive understanding of the impact of AI on the social sphere under urbanization. At the same time, economic challenges — such as financing digital initiatives, cost savings, digital inequality, and the efficiency of public investments — emerge as integral components of analyzing digital transformation in social governance within smart cities.

Aims. The purpose of this research is to assess the influence of artificial intelligence technologies on the transformation of governance approaches within the social sector, particularly in the context of developing smart cities in Ukraine.

The specific objectives of the study include:

- to analyze the concept of the smart city and its impact on the modernization of governance practices in the social sector;
- to investigate the possibilities and limitations of AI applications in the management of social services (healthcare, education, social protection);
- to identify key economic challenges faced by municipalities during digital transformation, including funding gaps and human resource constraints;

– to examine the potential for cost-efficiency improvements, enhanced service quality, and optimized resource use through digital solutions;
– to evaluate public trust in AI-based decision-making and identify barriers to equitable digital access.

Methodology. This study employed a mixed-methods approach, centering on a quantitative sociological survey conducted via online platforms. The questionnaire was distributed digitally using Google Forms, ensuring accessibility across multiple devices (PCs, tablets, smartphones).

The questionnaire included control questions designed to assess the following aspects: level of respondents' awareness about smart city services in their locality; extent to which AI contributes to improved access to social services (healthcare, education, security, social protection); factors that either promote or hinder the use of technology in citizens' everyday lives; attitudes toward automated decision-making processes in social sector governance; trust in digital solutions and perceptions of personal data protection; future outlook – which specific services citizens would like to see implemented in their communities.

A total of 1,627 respondents participated in the study. The sampling was quota-based (by gender, age, and education level) and clustered (by type of settlement). The sample was formed through social networks (Facebook, Telegram), thematic groups of civic initiatives (e.g., SmartCity UA, Digital Community), as well as with the support of leading higher education institutions: Taras Shevchenko National University of Kyiv, O. M. Beketov National University of Urban Economy in Kharkiv, Lviv Polytechnic National University, Vinnytsia National Technical University, Yuriy Fedkovych Chernivtsi National University, and others.

The distribution and sampling are presented in Table 1.

Table 1. Selection criteria for representative samples

Respondent Distribution	Sample, %	Number of Respondents
By Target Group		
Urban residents	81.26%	1,322
Students	11.18%	182
Representatives of public administration	7.56%	123
By Gender		
Male	42.8%	696
Female	57.2%	931
By Age		
18–24 years	18.3%	298
25–34 years	29.4%	478
35–44 years	31.7%	516
45–54 years	15.8%	257
55+ years	4.8%	78
By Place of Residence		
Rural area	6.7%	109
Town (up to 50,000 residents)	12.5%	203
City (50,000–100,000 residents)	14.3%	233
City (100,000–500,000 residents)	32.6%	530
City (over 500,000 residents)	33.9%	552

Source: estimated by the authors

Descriptive statistics and visualizations (figures and tables) were used to present and analyze the results. Qualitative insights from open-ended responses supported the interpretation of patterns and trends.

Results. In order to obtain an accurate picture of the development of "smart" urban technologies in Ukraine, the impact of artificial intelligence (AI) on the management of the social sector, as well as the level of public awareness, participation, and expectations regarding digital services for social purposes, a survey was conducted using remote technologies.

The questionnaire consisted of thematic blocks tailored to each target group. In response to the key survey question - “Is budgetary support (state or local) provided for digital social services in your city/community?” - a total of 1284 responses were received from the “urban residents” category (Figure 1).

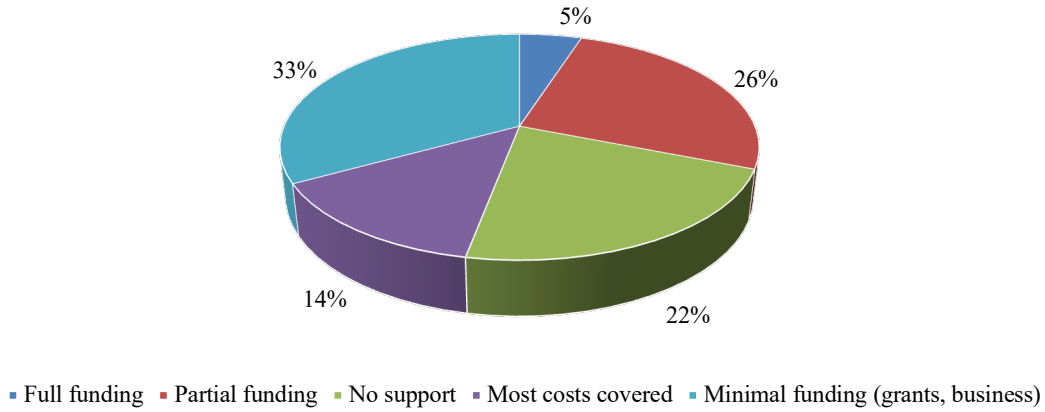

Figure 1. Assessment of the level of budget support for digital social services according to respondents

Source: estimated by the authors

Yes, only 5% of respondents believe that the state or local authorities fully ensure digital transformation in the social sphere, and 47% of respondents note that budget funding is either minimal or absent altogether. These indicators indicate insufficient support for the digitalization of social services, despite the strategic importance of this area. It is worth noting that the respondents' responses often mention such services that operate through partnerships with IT companies or with the support of donors (USAID, UNDP, etc.).

Question 2 for the category: “city resident” “How do you assess the availability of digital social services in your community (medicine, education, social protection)?” was answered by 1,270 respondents (Figure 2).

More than 76% of respondents indicated partial or low accessibility of digital services, which indicates the uneven digital transformation and the need for training the population. The picture is disappointing, since less than 1 in 4 respondents consider digital services accessible to all. 63% note that they are accessible only partially or with significant restrictions (territorial, age, technical). This distribution indicates digital inequality, which is manifested in the lack of equal access to basic social benefits due to weak digital infrastructure or low level of digital literacy of certain groups.

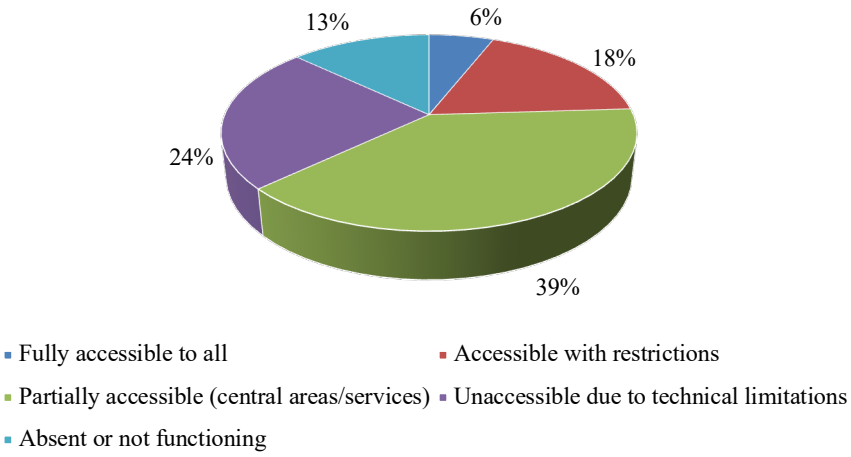

Figure 2. Assessment of the accessibility of digital social services in communities/cities (health, education, social protection)

Source: estimated by the authors

To question 3 "What factors motivate you to use digital social services?" the category "students" could choose up to 3 options. In total, 175 responses were received. The distribution of responses is shown in Fig. 3.

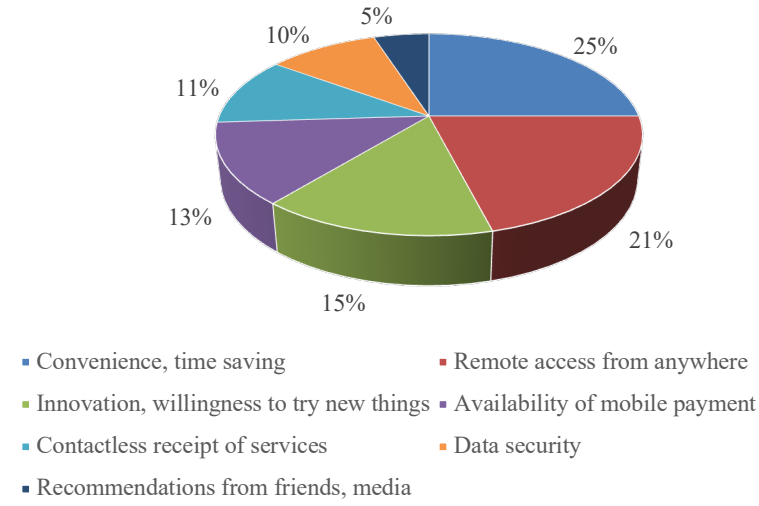

Figure 3. Motivational factors for using digital services for social purposes

Source: estimated by the authors

So, the predominant motivations are convenience, mobility and remote access - which was confirmed by more than 65% of students. That is, the young audience sees digitalization primarily as a practical benefit. At the same time, factors such as trust in data security and the ethics of digital solutions are less significant, which indicates a high pragmatism of young people, but at the same time - the need to form critical digital thinking.

Question 4 "What barriers hinder the development of a "smart city" and the introduction of AI into the social sphere?" concerned the category of "representatives of government bodies". 123 answers were received from respondents, according to which Fig. 4 was formed.

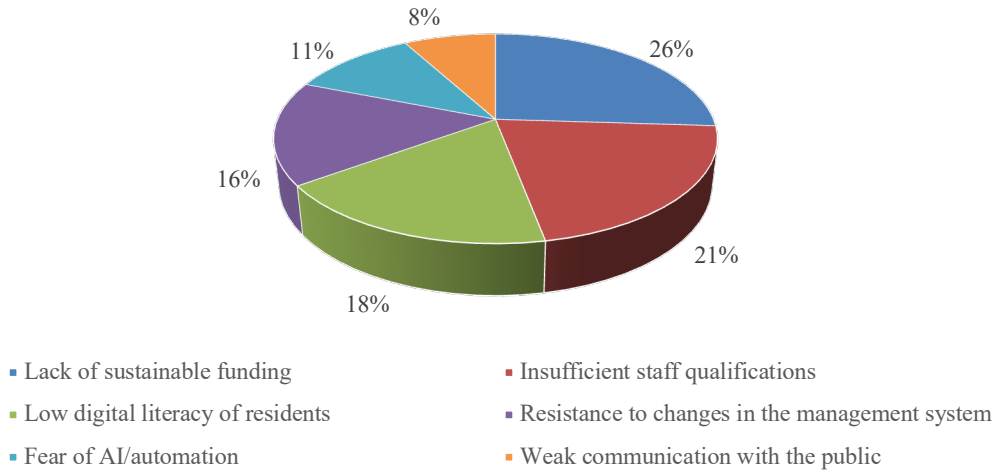

Figure 4. Barriers to the introduction of digital services in the social sphere according to the assessments of government representatives

Source: estimated by the authors

The results indicate structural problems in the implementation of innovations in municipalities. There is a lack not only of finances (69%), but also of qualified personnel, motivation of personnel, strategic vision. A psychological obstacle was also identified - fear of technologies that automate decisions. Thus, digitalization faces both material and mental barriers, overcoming which requires a systemic reform of local government. Therefore, the key problem is the lack of a financial model. The human factor also remains a systemic barrier - low readiness for change on the part of both the authorities and residents.

Question 5 “Do you trust automated solutions based on AI in the field of social security (for example, the assignment of assistance, benefits)?” was addressed to all categories of respondents. 1601 answers were received, according to which Fig. 5 was formed.

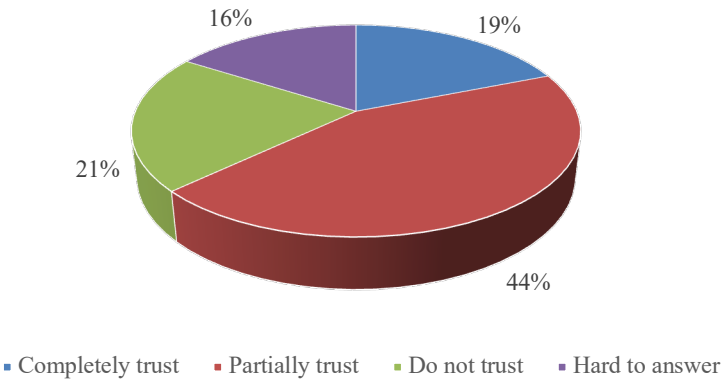

Figure 5. Level of trust in automated systems based on artificial intelligence in the field of social security

Source: estimated by the authors

So, only 19% fully trust automated systems, while 21% do not trust them at all. The majority, i.e. 44%, demonstrate conditional trust, depending on the type of service, which means that AI in the social sphere is not yet perceived as a fully legitimate and

transparent tool. People fear loss of control, mistakes, violation of rights. Thus, ethics, accountability and transparency are critically important for increasing the level of trust in automation. So, according to estimates, only 1 in 5 respondents fully trust AI, the majority is inclined to conditional trust or wariness, especially in matters of social support.

Question 6 "What role, in your opinion, should public administration play in the implementation of "smart city" technologies?" was also addressed to all respondents, there was an opportunity to choose 2 answer options. A total of 1,627 people answered the question, as shown in Fig. 6.

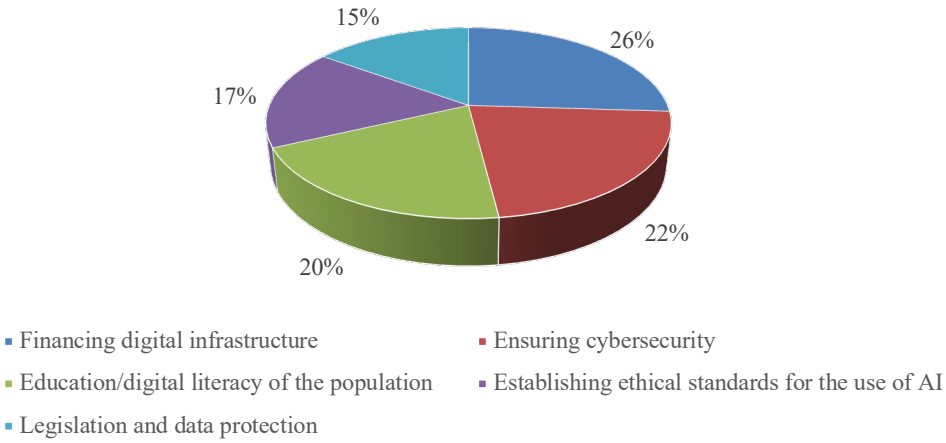

Figure 6. The role of public administration in the implementation of "smart cities"

Source: estimated by the authors

From Fig. 6 it follows that respondents clearly distinguish the role of the state as a guarantor and regulator: financing, security, training, ethics, legislation - five key answers. The result indicates the expectation of active, rather than formal, participation of the state in the digital transformation of social policy, with clear responsibility for infrastructure and protection of citizens' rights in the digital environment. Thus, the principle "digital state = safe state" appears as a citizen's request.

Thus, we can conclude that technologies are changing the model of access to social services, making them more convenient, transparent and less dependent on the human factor. However, universal availability of these services has not yet been achieved - over 75% of respondents indicated partial or complete unavailability of digital services in their community, which indicates the presence of barriers of both an infrastructural and educational nature that limit the effective use of innovations in the social sphere.

The implementation of Artificial Intelligence (AI) in the management of social services brings with it a range of economic benefits and costs, both in the short and long term. These impacts can vary depending on the level of technological integration, the maturity of the institutional environment, and the specific sector involved (e.g., education, healthcare, social protection).

Based on the results of the study, the economic benefits and costs associated with the implementation of AI in the management of social services were systematized (Table 2).

Table 2. The main economic benefits and costs associated with the implementation of AI in the management of social services

Category	Economic Benefits	Economic Costs
Operational Impact	Automation reduces administrative workload and lowers operational costs.	High initial investment in AI infrastructure, software, and integration.
Resource Allocation	AI enables data-driven decision-making and more efficient distribution of resources.	Ongoing maintenance, system updates, and technical support increase recurring expenses.
Service Quality	Personalized and timely services improve user satisfaction and reduce inefficiencies.	Risk of misalignment with institutional workflows, leading to underperformance and sunk costs.
Fraud and Risk Management	AI detects anomalies and prevents fraud, reducing financial losses.	Requires investment in cybersecurity and data protection compliance.
Policy and Planning	AI supports economic forecasting and better long-term budget planning.	Dependence on accurate, comprehensive data; poor data quality can reduce effectiveness.
Return on Investment	Long-term ROI through sustained cost savings and performance improvement.	Benefits may take years to materialize, creating political or financial pressure in the short term.
Labor Market Impact	Allows reallocation of human capital to more value-added roles.	Potential job displacement requires reskilling programs and social support.
Social Equity	Better targeting of vulnerable populations can improve social outcomes.	Digital divide and unequal access may require additional public spending to ensure inclusivity.

Source: systematized by authors

Digital technologies - particularly AI, data analytics, and digital platforms - significantly enhance cost-efficiency across key domains of the social sector by streamlining processes, improving targeting, and reducing redundancy (Figure 2).

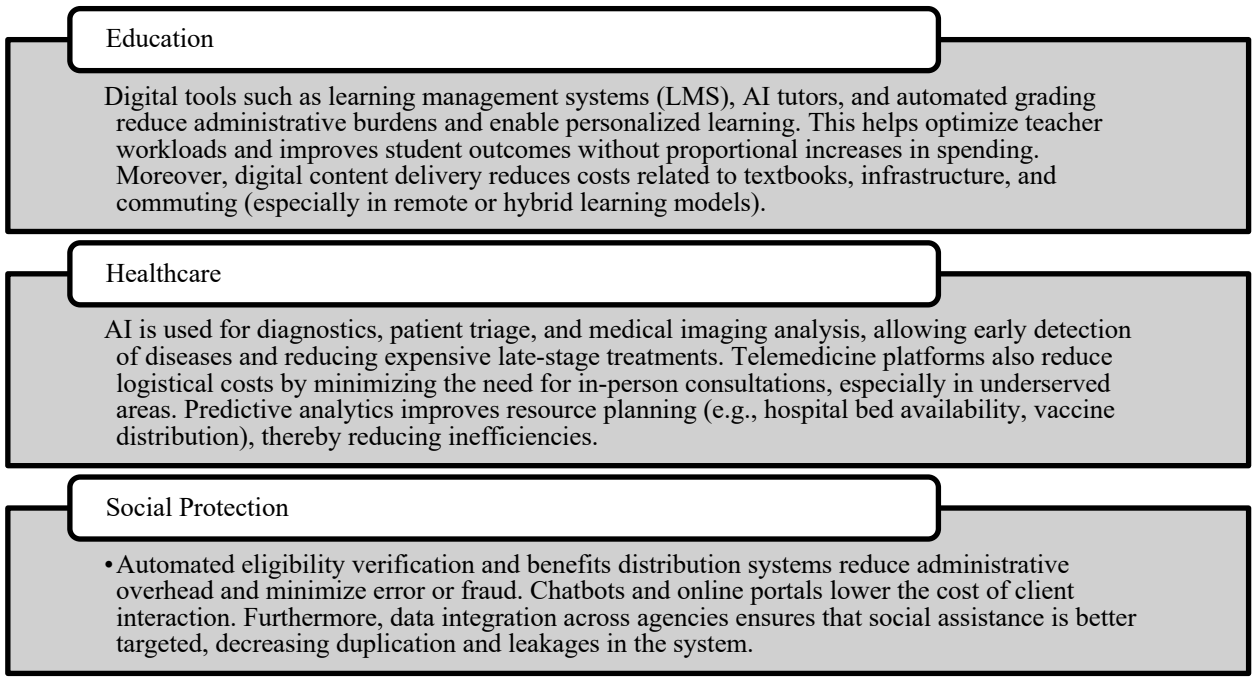

Figure 7. Areas for improving economic efficiency in key social sector domains through the use of digital technologies, data analytics, and digital platforms

Source: systematized by authors

In all three sectors, cost-efficiency gains are most pronounced where digital tools are integrated into well-designed workflows, supported by robust data infrastructure and institutional capacity. Studies from OECD countries show savings of 15–30% in certain digitalized social programs compared to legacy systems, though these numbers vary by country and maturity of implementation.

The smart cities are driving the emergence of innovative financing and resource allocation models in the social sector, often shaped by digital technologies, data-driven governance, and multi-stakeholder ecosystems:

Performance-based budgeting – with the help of real-time data, municipalities can now link budget allocations to measurable outcomes (e.g., student literacy rates, patient recovery times, housing stability). This enhances transparency and allocative efficiency in social spending;

Participatory budgeting with digital platforms – digital tools are being used to allow citizens to vote on or propose allocations for social projects, which democratizes spending and improves the alignment of resources with local needs. These platforms also serve as feedback loops for evaluating public satisfaction and service delivery.

Public-private partnerships (PPPs) – smart cities often leverage PPPs to co-finance digital infrastructure in education and health. For example, tech companies may provide cloud services or platforms in exchange for long-term service contracts or data-sharing agreements. This reduces the upfront public financial burden but raises questions about data governance.

AI-driven resource optimization models - municipal governments use algorithmic tools to simulate budget scenarios, reallocate underused assets (e.g., vacant housing or clinic hours), and forecast future demand in real-time. These models allow dynamic rather than static planning.

Social impact bonds and outcome-based financing - these instruments tie private investment to socially desirable outcomes (e.g., reduced recidivism or improved school attendance), with digital tracking used to verify success. The government repays only if outcomes are achieved, minimizing fiscal risk.

Integrated digital platforms for interagency collaboration - shared databases and interoperable platforms allow for pooled resources and coordinated service delivery across agencies. This reduces fragmentation and redundancies in the system.

In sum, the smart city framework promotes not only digital innovation but also fiscal innovation—changing howpublic value is created, funded, and evaluated in the social domain.

Discussion. The results of the study reveal a paradox: while digital transformation is widely acknowledged as a strategic necessity, its practical implementation in Ukraine's social sector remains uneven, underfunded, and met with skepticism. Only 5% of urban respondents believe their communities receive full public funding for digital social services, while nearly half report minimal or absent support. This discrepancy suggests a significant gap between national digital agendas and local fiscal realities.

Accessibility is another critical challenge. Over 76% of respondents report partial or limited access to digital services such as online healthcare, digital education, and social protection platforms. Barriers include poor infrastructure, regional disparities,

and low digital literacy—especially among vulnerable populations. The issue of digital inequality is particularly acute, with 63% indicating that services are only conditionally available due to territorial, technical, or demographic limitations.

Motivations for adopting digital services vary across groups. Among students, convenience and mobility are primary drivers, while concerns such as data privacy and algorithmic ethics receive less attention. This pragmatism reflects generational differences but also indicates the need to cultivate critical digital thinking and awareness of long-term implications.

Among public administrators, the barriers to digital transformation are not merely technical but deeply structural. Lack of funding (cited by 69%), shortage of qualified personnel, resistance to change, and absence of a strategic vision were all identified as key obstacles. These insights highlight the need for comprehensive public sector reform, not just technological upgrades.

Trust in AI remains low to moderate: only 19% of all respondents fully trust AI-based decision-making systems, while 44% express conditional trust, depending on the context. Concerns include potential errors, lack of transparency, and loss of human oversight—factors that must be addressed through ethical design, legal safeguards, and participatory governance.

Economically, AI offers clear benefits in operational efficiency, fraud detection, predictive planning, and service personalization. However, it also entails substantial costs: infrastructure investment, cybersecurity, maintenance, and training. The study identifies innovative financing models—such as performance-based budgeting, public-private partnerships, and AI-based resource simulations—as promising strategies to align economic efficiency with digital equity in the social sector.

Conclusions. This research highlights that digital transformation in the social governance of smart cities operates on two interconnected levels: as a technological advancement and as a complex socio-economic endeavor. While innovations in AI and digital platforms hold the promise of more efficient service delivery and improved economic outcomes, their effective implementation depends heavily on institutional capacity, inclusive governance, and the cultivation of public trust.

A central conclusion is that digital inequality continues to pose a major obstacle. Uneven access to technology and gaps in digital literacy exacerbate regional and social disparities, limiting the inclusiveness of smart city reforms. Compounding this challenge is the fragile and conditional nature of public trust in AI systems, which can only be strengthened through transparent, ethical, and accountable governance mechanisms.

At the same time, local governments often lack the financial resources, organizational frameworks, and skilled personnel needed to drive sustained digital transformation. Although economic benefits such as cost reductions and service improvements are achievable, they require significant initial investment and a commitment to long-term strategic planning. Therefore, the success of smart city reforms depends not only on adopting new technologies but also on aligning them with innovative fiscal policies that support inclusive development.

In the context of Ukraine, advancing smart city initiatives will require a holistic approach that extends beyond infrastructure. Building socially just digital governance

means prioritizing digital education, fostering citizen participation, and enabling collaborative networks across public, private, and civil society sectors. Only by addressing these interdependent challenges can smart cities become both technologically advanced and socially equitable.

Acknowledgements. The author expresses sincere gratitude to all survey participants for their active engagement, as well as to the administrators of the SmartCity UA, Digital Community, and other civic initiatives who contributed to disseminating the questionnaire via social networks (Facebook, Telegram) and reaching the target audience.

Special thanks are extended to the leading higher education institutions for their organizational support of the study, in particular: Taras Shevchenko National University of Kyiv, O. M. Beketov National University of Urban Economy in Kharkiv, Lviv Polytechnic National University, Vinnytsia National Technical University, Yuriy Fedkovych Chernivtsi National University, and other academic institutions that participated in data collection and the dissemination of information among students and expert communities.

Thanks to this joint effort, a valuable dataset was gathered, enabling a comprehensive analysis of the state of digital transformation in the governance of Ukraine's social sector.

Author contributions. The authors contributed equally.

Disclosure statement. The authors do not have any conflict of interest.

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Economics, Finance and Management Review

Issue 1 (21), 2025

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Printed by: Scientific Center of Innovative Research OÜ, Ida-Viru maakond, Lüganuse vald, Püssi linn, Viru tn 8-33, 43221, Estonia
Number of copies: 300
First printing: March 31, 2025
Distributed worldwide by Scientific Center of Innovative Research OÜ - office@scnchub.com
Full text available online at https://scnchub.com
DOI: 10.36690/2674-5208-2025-1