INNOVATIVE MECHANISMS OF PUBLIC MANAGEMENT FOR SUSTAINABLE TERRITORIAL DEVELOPMENT: DIGITIZATION, ANALYTICS, AND COMMUNICATION

MECANISMOS INOVADORES DE GESTÃO PÚBLICA PARA O DESENVOLVIMENTO SUSTENTÁVEL DE TERRITÓRIOS: DIGITALIZAÇÃO, ANÁLISE E COMUNICAÇÃO

ІННОВАЦІЙНІ МЕХАНІЗМИ ДЕРЖАВНОГО УПРАВЛІННЯ ДЛЯ СТАЛОГО РОЗВИТКУ ТЕРИТОРІЙ: ЦИФРОВІЗАЦІЯ, АНАЛІТИКА ТА КОМУНІКАЦІЇ ЯК ОСНОВА ЕФЕКТИВНОЇ ВЗАЄМОДІЇ МІЖ ВЛАДОЮ, БІЗНЕСОМ ТА ГРОМАДСЬКІСТЮ

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Abstract. The article makes an attempt to comprehend shifts in territorial public management within the landscape of digital transformation and localizing SDGs. Particular attention is paid to vectors, factors, and drivers of digitization of public management in frames of the efforts on developing innovative mechanisms for territories' sustainable development. The role of data analytics, as well as public and businesses engagement in the creation of effective digital eco-system is analyzed, and a range of recommendations is presented.

Keywords: public administration, digitization, communications, territorial communities, analytics, local government, Big Data, SDGs, innovative mechanisms of public administration, digital tools.

Resumo. O artigo busca compreender as mudanças na gestão pública territorial no contexto da transformação digital e da localização dos Objetivos de Desenvolvimento Sustentável (ODS). Uma atenção especial é dada aos vetores, fatores e impulsionadores da digitalização da gestão pública no âmbito dos esforços para desenvolver mecanismos inovadores para o desenvolvimento sustentável dos territórios. O papel da análise de dados, bem como o engajamento do público e das empresas na criação de um ecossistema digital eficaz, é analisado, e uma série de recomendações é apresentada.

Palavras-chave: administração pública, digitalização, comunicações, comunidades territoriais, análise, governo local, Big Data, ODS, mecanismos inovadores de administração pública, ferramentas digitais

Анотація. У статті робиться спроба осмислити зрушення в територіальному публічному управлінні в умовах цифрової трансформації та локалізації ЦСР. Окрему увагу приділено векторам, факторам та драйверам цифровізації публічного управління в рамках зусиль із

розробки інноваційних механізмів сталого розвитку територій. Проаналізовано роль аналітики даних, а також залучення громадськості та бізнесу до створення ефективної цифрової екосистеми та надано ряд рекомендацій.

Ключові слова: публічне управління, комунікації, територіальні громади, аналітика, місцеве самоврядування, Big Data, ЦСР, інноваційні механізми державного управління, цифрові інструменти.

1. INTRODUCTION

The Agenda 2030, which includes 17 Sustainable Development Goals (SDGs) and 169 goals, was unveiled in 2015. However, more than halfway through 2030, the majority of the goals and targets are far from being met. To fulfill the SDGs, it is necessary to recognize the interlinkages between them. They necessitate a multilevel, multi-stakeholder, multi-sector, and whole-of-government approach to governance. Against this backdrop, territorial methods are extremely significant. They provide systematic, context-specific, geographically anchored, and inclusive approaches to sustainable development. Territorial methods integrate numerous SDGs and give a real conceptual and practical framework for overcoming isolated approaches (Territorial approaches for sustainable development, 2023). Territorial methods can be an effective way to track progress and assist accomplish the SDGs. They can bring together international, national, and local players to share best practices, influence relevant policy agendas, assist implementation, and evaluate and establish guidelines, evaluations, and training materials. Organizations that assist territorial development might leverage current possibilities to enrich and benefit from knowledge management and planning. This might involve establishing and supporting networks for coordinated learning, as well as encouraging action across international and territorial coalitions.

Establishing multi-stakeholder procedures to offer context-specific territorial evaluations fosters mutual understanding, increases trust, and serves as the foundation for evidence-based action initiatives. Working with complexity includes identifying territorial assets at the beginning of a project or program design. These assets include territorial governance (law and customary rules and practices, power relations), territorial intelligence (networks and actors' ability to interact, generate data and operational norms, build on local and indigenous knowledge and traditional practices, and so on), and territory resources (human, material, economic, financial, social, natural, and cultural). It turns out that deep-scaling operations embed territorial approaches beyond the time and scope of single efforts and are linked to the creation and upkeep of long-term territorial intelligence (Ribeiro et al., 2024).

Moreover, in order to develop and execute territorial approaches, it is necessary to recognize and address issues of power relations, access to resources, infrastructure, and services, as well as their implications for policy processes and initiatives. Territorial methods bring together players with various, even opposing interests and perspectives (Zahorskyi et al., 2022; Zilinska et al., 2022).

In this complex landscape, crucial importance belongs to designing innovative mechanisms of public management for the sustainable development of territories, among which digitalization, analytics and communications as the basis for effective interaction between government, business and the public take the most significant place.

2. THEORETICAL FRAMEWORK OR LITERATURE REVIEW

Academics and policymakers have long agreed that centralization is not the best road to progress. Their hierarchical and bureaucratic structures failed in emerging nations (Carrasco et al., 2022). For a variety of reasons, shifting from a centralized to a localized governance model entails decentralizing governance to bring it closer to the people (Borysenko et al., 2022). First,

there is a political necessity that suggests local populations would advocate for independent local institutions (Guadrado-Ballesteros & Garca-Sanchez, 2017). Allowing communities at the local and regional levels to participate in decision making brings policies closer to problems and individuals, providing the path for partnerships to address issues with broad ramifications. Second, the economic imperative contends that lowering government functions would allow small and medium-sized businesses to unlock fresh investments and generate new technologies that will promote sustainable development (Avedyan et al., 2023; Halushka et al., 2024; Lukashev et al., 2022). Third, the service delivery imperative implies that local institutions are better equipped to comprehend people's needs, enabling for improved public service delivery by prioritizing spending (Equey et al., 2024; Vasylevska et al., 2022).

Unlike decentralization, the notion of localization is not administrative in nature, but rather includes the advantages of both centralization and decentralization. Localization maintains the benefits of centralization while aligning local communities with national development plans and ensuring national security. It also contains the benefits of decentralized government, such as customizing priorities to the needs of local communities and encouraging accountability and openness at the grassroots level. ElMassah and Mohieldin (2020) argue that localization is a "system-wide" objective for sustainable development for a variety of reasons. Localization promotes inclusion, responsibility, and acceptability within the target community. It guarantees that choices are made closer to the communities served, reflecting their needs and aspirations. It is related with accountability, which is sought and supported by local communities, improving the likelihood of long-term development success. In a localized notion, decision makers understand local concerns, speak the local language, and are well-versed in the local context. According to Therborn (2017), the provision of local services represents a direct embodiment of local authority. Access to the availability of services shape local community life. Localizing the development agenda fosters resilience in communities by allowing them to learn from their own experiences and needs via a dynamic feedback loop, particularly in service delivery (Liubkina & Murovana, 2019).

Localization of sustainable development introduces innovative public management mechanisms for the sustainable development of territories, particularly through The Territorial Approach for Local Development (TALD), a comprehensive policy framework that emphasizes endogenous, multi-scalar, integrated, and incremental local development (Asian Development Bank, 2021). Under this framework, local governments have major responsibility for planning, financing, and managing local development, which is carried out via effective interaction between government, business, and the public, based on the possibilities and advantages of digitization and analytics.

The TALD framework is not a formal model, but rather an analytical framework for determining how decentralization reforms might be linked to improving development results. The building blocks of a territorial approach to local development schematically can be depicted as follows (see Fig. 1):

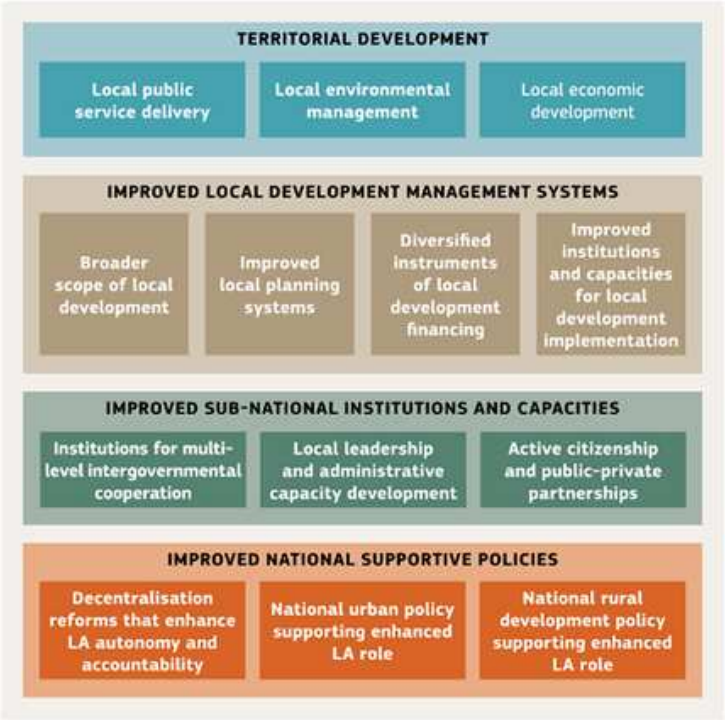


Figure 1. *The building blocks of a territorial approach to local development* (Baqir et al., 2021)

The effective functioning of this frame, in turn, is based on digitalization, analytics, and communications for proper interaction between government, business and the public.

3. METHODOLOGY

The theoretical and methodological foundations of the study are the approaches and conceptual provisions of such sciences as regional development, institutional theory, strategic public administration, and the theory of sustainable development.

The methodological basis of the work is represented by the synergetic paradigm, which combines and synthesizes the system and institutional approaches. In the course of the study, general scientific methods of theoretical and empirical knowledge were used: the method of scientific abstraction, methods of analysis and synthesis, the method of analogies, and the logical method.

4. RESULTS AND DISCUSSION

Digitization and the application of analytics may be seen most clearly in e-government. E-Government is the digital transformation of government entities, with the majority of administrative activities handled online, with the goal of improving government performance, increasing coordination, and providing speedier service delivery to residents (ElMassah & Mohieldin, 2020). Many local units/cities have shifted to the new e-Government paradigm for Web-based services and information technology administration, which contradicts the conventional bureaucratic model. E- Government allows for better delivery of government services to citizens, stronger ties with companies and industries, citizen empowerment through information access, and more effective government management. The advantages might include less corruption, improved transparency, increased convenience, revenue growth, and/or cost reductions (World Bank, 2015). Big data represents a vast amount of structured and unstructured data collected from a variety of sources such as emails, phone logs, mobile

banking transactions, online user-generated social media, internet searches, satellite photos, mobile devices, apps, and so on.

Digital transformation has the ability to assist the SDGs by analyzing collected information using computational approaches to uncover trends and patterns and turning it into actionable dynamic information on human behaviors, the environment, and experiences6. Such data have the potential to help policymakers build appropriate development initiatives, assess success, and drive dynamic change. This opens up new prospects for achieving the SDGs while lowering transaction costs. Digital transformation helps local governments construct sustainable and resilient communities by collecting inclusive data. Both e-government and big data illustrate SDG 16's five important dimensions: effectiveness, inclusiveness, openness, trustworthiness, and accountability. There are several best-practice digital transformation instances that might serve as standards for local governments throughout the world.

After conducting analysis of seven cases - Cambodia, Colombia, Egypt, Ghana, Kenya, the Philippines and Tunisia – ElMassah and Mohieldin (2020) presented a board that summarizes thorough analysis of the case studies in terms of the existing digital transformation initiatives and their local SDGs-related potential (see Fig. 2 below).

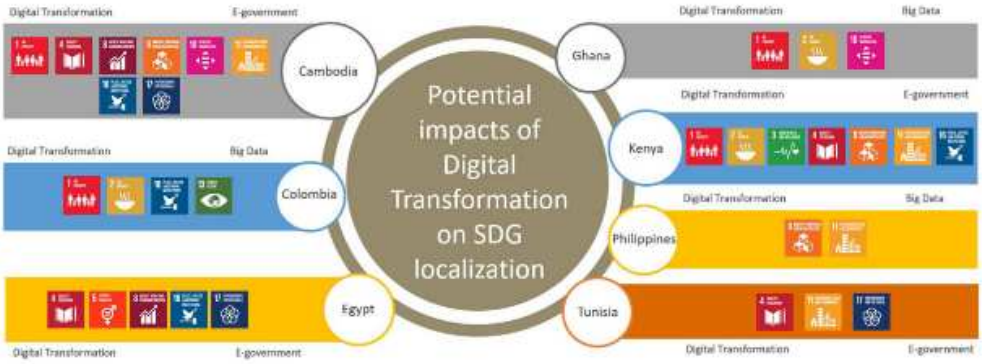


Figure 2. *Potential impact of digital transformation on localizing the SDGs* (ElMassah & Mohieldin, 2020)

The same authors outlined the overall benefits of localization (see Fig. 3).



Figure 3. Localization as a system goal for sustainable development (ElMassah & Mohieldin, 2020)

By localizing the SDGs, governments may successfully customize sustainable development policies to the local context. The notion of localization takes advantage of both decentralization and centralization as ways of administration. Furthermore, it maintains the advantages of centralization, such as fully connecting local communities with national programs and strengthening national security. It also gains benefits from decentralization, such as improved public service delivery through openness and accountability. This not only fosters ownership of the SDGs at all levels of society, but it is also the most feasible strategy for

attaining the SDGs and the 2030 Agenda. Localization also spreads ownership of the SDGs across all levels of the society, emphasizing inclusive development. As a result, localization is a more resilient system of governance and the most practical way to achieve the Sustainable Development Goals (Xavier et al., 2024).

Indeed, true sustainable development of territories is impossible without effective communication between government, business, and public.

The application of user-centered design concepts is one method for engaging individuals in the public sector's digital transformation. Governments may ensure that digital public services meet the particular needs and preferences of their users by including citizens and policymakers in their development. This not only improves service efficacy and quality, but also supports the implementation of policies and decisions that address tough global and local issues such as education, sustainability, and the redesign of the delivery of public service (Latupeirissa et al., 2024).

The transition from bureaucracy to citizen-centeredness in public administrations may be characterized and assessed, however it may pose some obstacles due to its qualitative nature. This shift often involves changing the focus of service delivery away from internal processes and towards citizen needs and satisfaction. It is typically assessed using metrics such as service accessibility, response times, public satisfaction, and transparency. Quantitative information, such as the amount of online services, digital transaction volumes, or user feedback ratings, can be combined with qualitative evaluations of customer service and policy efficacy. Internal bureaucratic culture improvements must be continuously monitored and evaluated to see if they result in better citizen-centric services. Citizen input mechanisms, questionnaires, and interactive assessments can all help to provide a thorough knowledge of this shift.

There are several ways in which the advantages of digitalizing public service delivery are evident. Digital transformation improves customer experience and governance in addition to citizen-centric services. Public service delivery has become more intelligent and efficient thanks to the application of artificial intelligence in public administration as part of digital transformation initiatives. It has made it possible to automate everyday chores, analyze data to guide policy decisions, and provide individuals individualized services (Nguyen, 2024). However, there are dangers and difficulties associated with its advantages. Criteria like legality, accuracy, bias, accountability, responsibility, transparency, explanation, and control must be used to evaluate the application of AI in public administration. Understanding the potential benefits, drawbacks, and solutions associated with the application of digital technology and artificial intelligence in the public sector is essential to addressing these problems.

The successful implementation of digitization initiatives in public service delivery requires a cultural shift, the establishment of a regulatory sandbox to test new technologies in a controlled and ethical way, and the removal of barriers such as bureaucratic culture, insufficient regulations, limited data integration, gaps in the availability of ICT infrastructure, and limited ICT competencies. A thorough examination of public sector digitization projects reveals that digital tools and platforms significantly affect governance practices and service delivery. Despite the many benefits, it is important to address the possible challenges and traps to ensure the appropriate and efficient use of digital technology in the public sector. This requires a thorough understanding of the many benefits, issues, and solutions associated with the application of AI and digital technologies in the provision of public services.

The aspects of digitization are divided into three categories: advantages, obstacles, and success factors (Latupeirissa et al., 2024). This mapping visualizes the numerous facets of digitalization and emphasizes the need of addressing problems while capitalizing on possibilities for success (see Fig. 4).

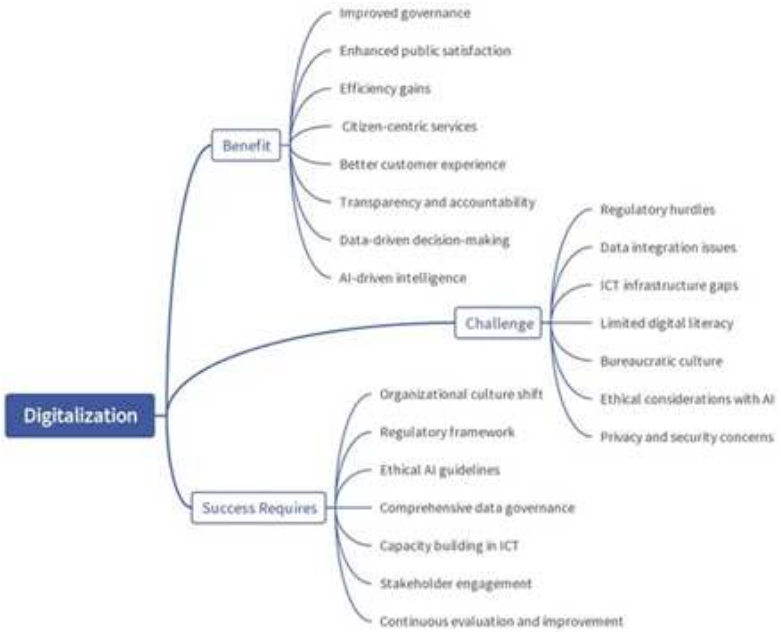


Figure 4. *Digitalization in public service delivery map* (Latupeirissa et al., 2024)

Research on large-scale data management in public administration is essential to address concerns about AI integration in light of the growing data-driven economy (Kawtar & Khadija, 2024). Big data technologies and software products must be appropriately administered in order to monitor technological activities in real time and improve the efficiency of providing public services to society. Furthermore, it is essential that digital transformation be implemented in big metropolitan regions to benefit from citizen-centric and user-friendly services, which will ultimately lead to a better economic climate and a higher standard of life (Debeljak & Dečman, 2022).

Local government officials must continually examine the impact of existing public initiatives, the state of local assets such as infrastructure, and which policies to emphasize in future budget allocations. However, without sophisticated analytics, monitoring progress and making educated decisions is difficult. Local governments are currently collecting enormous amounts of data based on their services and information on their customers and citizens (Klievink et al., 2016; Rogge et al., 2017; Territorial approaches for sustainable development, 2023). Primarily, most local governments appear to be wrestling with the single issue of how to produce and leverage the many data they have, while also developing the requisite analytical capabilities to move toward the aim of data-driven decision-making (Matheus et al., 2020). Local governments face significant benefits and challenges when attempting to exploit their own data. Evidence shows that councils are not utilizing or leveraging data to its full potential (Alavi & Buttlar, 2018). Meanwhile, the application of big data technology in the European public sector can lower expenses by 20%, resulting in $300 billion in savings (Lowman, 2017). This estimate is based on the assumption that data analytics can help local governments allocate resources based on where they will have the greatest impact, as well as restructure services so that early prevention is prioritized to avoid the need for more expensive involvement. The use of personalized AI technologies may significantly improve data analytics for local governments, resulting in better territorial development. Machine learning may also be utilized in predictive analysis since it enables computers to anticipate outputs based on prior examples of input-output correlations. Predictive analytics may assist in understanding the possibility of future occurrences or failures.

The ethical and regulatory frameworks that regulate the use of AI in public services require improvements in governance in addition to technology solutions. The implementation of

accountability standards is necessary to guarantee that AI systems function transparently and can be held accountable for their results. In order to ensure consistency and synergy in the extension of public service delivery, a robust digital transformation plan is also necessary to combine the deployment of AI with larger digitization activities. In this era of data-driven decision-making, big data governance in public administration is becoming a more urgent concern (Yang et al., 2024). In addition to facilitating real-time technological process administration, effective big data governance raises the effectiveness and responsiveness of public service delivery to the general public, which includes both individuals and businesses. Additionally, there is a great deal of promise for digital transformation in large cities to enhance user-friendly services and promote citizen-centered government, which will enhance the standard of living and business environment.

The transition from bureaucracy to citizen-centeredness in public administrations may be characterized and assessed, however it may pose some obstacles due to its qualitative nature. This change frequently entails shifting the emphasis of service delivery from internal procedures to the demands and satisfaction of citizens. Indicators including response times, public satisfaction, transparency levels, and service accessibility are commonly used to gauge it. Qualitative evaluations of customer service and policy efficacy can be combined with quantitative data, such as the quantity of digital transactions, the number of online services, or user feedback ratings. To determine if internal improvements in bureaucratic culture lead to improved citizen-centric services, ongoing monitoring and assessment would be necessary. Participatory evaluations, questionnaires, and citizen input techniques can all be used to correctly measure this shift (Sundberg & Holmström, 2024).

The move from e-government to digital government is critical for significantly improving customer experience (Aminah & Saksono, 2021). This transition needs a reassessment of public administration principles and governance structures to ensure proper adaptation to the digital era. To create regulations that support smart city initiatives and direct data governance in intricate digital transformation situations, organizations can utilize data policy and governance frameworks, such as the IAD framework (Ylinen & Pekkola, 2019).

Furthermore, the transition to data-driven decision-making gives a tremendous potential to improve governance efficacy. The complete data analysis yields essential insights into community needs and trends. These findings drive policy design suited to specific populations, reducing uncertainty and allowing for more focused and impactful initiatives that directly address the identified needs. Beyond these benefits, digital transformation promotes openness and accountability in governance systems. Open data efforts and real-time access to government performance measures enable individuals to examine government activities, spending, and project progress. This transparency promotes trust and accountability within governance structures, establishing a culture of responsible and transparent activities that protect the public interest (Debbarma & Sharma, 2023).

Improved connections with people must be complemented by greater use of newly obtained information and data. This is where the back office system upgrades really shine. By using big data analytics, local governments may acquire vital insights into their community's needs and utilize them to make data-driven decisions. As the workforce grows increasingly digitally competent, governments can utilize predictive analysis tools to forecast patterns in service demand. This allows for more proactive resource planning, streamlined service delivery, and improved response to the requirements of local people.

A public sector company intending to get value from big data analytics should carefully design a path in which they focus on the following domains (Richards, 2017):

1. Before beginning, public organizations should consider, discuss, and coordinate with key stakeholders about the potential for maximizing, redefining, or disrupting the value of any (big) data analytics program. They also need to provide supported hypotheses about what may

be accomplished by increasing insights for diverse stakeholders. The emphasis on advantages and insights should flow throughout the effort.

2. It is critical to invest in knowledge capture for organizing and documenting data assets. They must establish stakeholder confidence through robust data management policies that adhere to relevant laws and ethical values, as well as articulate why data is suitable for its intended purpose.

3. To meet the multifaceted issues associated with big data analytics, it is apparent that both business and technological talents must be utilized. They may supplement their own talents with the strengths of partners and suppliers to achieve immediate successes while developing their own skills.

4. To meet the demands of multidisciplinary stakeholders in a diverse environment of technological solutions, it is critical to create integrated, scalable, and adaptable IT systems. As technology evolves, public entities must be prepared to adapt.

5. Maturity in this area should be viewed as a journey with several difficulties, and a thorough plan is required to address these in a holistic and balanced manner. Failure is a good teacher and should be regarded as such.

In addition to these 'internal' recommendations, public authorities should see themselves as part of a larger ecosystem of insight-driven enterprises. In doing so, public institutions must recognize that information management and qualitative meta-data are crucial for more than just internal issues. Data interchange with other public entities has the potential to open up a plethora of new fields where data can be valuable. The semantic interoperability difficulty will only increase as more big data sources are generated at a rapid pace. To address technical, privacy, and security concerns, the adoption of shared safe technological environments and appropriate governance frameworks will be necessary for exchanging big data files.

Furthermore, big data analytics should be considered a significant subject in which governments have increasingly high stakes and advantages from collaborating with public and commercial partners (Karpa et al., 2023). There are several ways to collaborate in this field. One way is to offer insight services, which provide insights into the potential benefits of Big data analytics; advisory services, which offer guidance and specific advice on how to use big data analytics; enabling services, which offer essential tools, data, and resources (such as funding, people, and skills) for big data analytics; and/or production services, which offer ready-made solutions or data analytics for others (Koshova et al., 2022; Kulikov et al., 2022).

Big data and data analytics provide several opportunities for public sector enterprises. They might draw inspiration from the experiences of others who have created value using analytics on internal and external data when developing appropriate business cases and initiating projects.

All sorts of data can give useful insights to territorial public authorities if they are examined correctly, using good analytical techniques appropriate to the type of data, hypothesis, and problems at hand. Analytics approaches help to generate insights from data and content. These approaches must be able to address more complicated concerns. At a high level of abstraction, such data analytics approaches are divided into four major categories:

1. Descriptive analytics: it combines business intelligence and basic statistics to answer the question, "What has happened?". This type of study describes the past using aggregated or comprehensive data. Table and graph representations can help to speed up comprehension.

2. Diagnostic analytics attempts to analyze any phenomena from many viewpoints using data mining and correlation tools in order to determine why things happened. It sets information in context and seeks to identify distinctions or evolution based on the context. Visualization is used to identify variations, outliers, and changes across time.

3. Predictive analytics is the application of statistical models and forecasting techniques to answer the question, "What will happen?" Predictive analytics calculates and assesses the possibility of future trends or events based on previous data patterns.

4. Prescriptive analytics influences activities by employing a variety of approaches, optimization algorithms, and simulation exercises to answer the question "What should we do?". Prescriptive analytics integrates predictive models with operational solutions and choices to provide decision assistance. It assists individuals (decision support) or systems (decision automation) in determining the appropriate next course of action.

An intriguing example is the case of "Transport for London (TfL) data analytics". Transport for London is a municipal government entity in charge of transport in London. It was established in 2000 and is the integrated authority in charge of the Capital's transportation system. Its primary function is to implement the Mayor's Transport Strategy for London and administer transportation services across the Capital for which the Mayor is responsible. TfL is in charge of London's main road network, multiple rail networks such as the London Underground, London Overground, Docklands Light Railway, and TfL Rail, as well as London's trams, buses, and taxis, bicycle infrastructure, and river services. The Mayor's Transport Strategy is now preparing for the Capital's expected increase of 1.25 million more people and 0.75 million more jobs by 2031, as well as supporting long-term growth throughout London. TfL's goal is to provide a positive experience for each client by adhering to the "each journey matters" principle. There is large data, and there is TfL data. Every daily, 7 million people go by bus and 4 million on the London Underground. TfL uses this enormous data collection to solve important business concerns. For example, Transport for London (TfL) tracks and manages its fleet of approximately 8,500 vehicles using a single technological solution to give precise position information, service control, and real-time passenger data. For London, the need for accuracy is greater since the same control and information system that feeds passenger information on service supply is also utilized as the payments engine for mileage and performance payments to its bus service providers totaling over £1.6 billion (Barbero et al., 2016). TfL has highlighted the following essential points for the future (Barbero et al., 2016):

- Integrating ticketing, bus, traffic congestion, as well as incident data to improve the performance of bus and road networks;
- Integrating social media with client data for a better comprehension;
- Examining meteorological data to determine its impact on transportation;
- Using modern data mining technologies and geospatial visualizations to bring data to life.

Moreover, experts recommend providing partners and stakeholders with performance benchmarking opportunities (Ribeiro et al., 2024).

Territorial governments dealing with new data and finding new analytical approaches shift away from descriptive and diagnostic analysis and toward predictive and prescriptive analysis. At the same time, they should remember that designing analytics solutions and developing appropriate innovative mechanisms for territorial development is a continuous process, with the goal of maximizing citizen and business user experience while minimizing analytical or decision-making efforts. Furthermore, in light of the complexities of related challenges and the need to mix skills, public management territorial bodies should begin to consider collaboration between different departments, with private companies, and between different public sector organizations as an eco-system of internal and external parties providing each other services to complement skills, and find win-win strategies for creation of common societal value.

5. CONCLUSION

Considered theoretical framework and cases of practice allow emphasizing a core role of territorial governments in achieving SDGs. At the same time, effective implementation of sustainable development vectors is unlikely possible without effective interaction between government, public, and business actors, implemented within digital eco-system and Big Data analytics. Descriptive, diagnostic, predictive, and prescriptive analytics support decisions in various processes within territorial community and enable building effective communication, diminishing misunderstanding and uncertainty, as well as promoting transparency.

The findings also highlight how crucial it is to develop more systematic thinking while building a digital local government. The digitalization of government processes and services necessitates a thorough reassessment of governmental responsibility rather than just technology improvements. This is a journey, consisted of steps and not happening at once, however, when organized properly, local governments become a kind of intermediaries to foster cooperation and partnerships within the SDGs plane.

REFERENCES

Alavi, A., & Buttlar, W. (2018). *Data analytics for smart cities*. Auerbach Publications.

Aminah, S., & Saksono, H. (2021). Digital transformation of the government: A case study in Indonesia. *Jurnal Komunikasi: Malaysian Journal of Communication, 37*(2), 272-288.

Asian Development Bank (2021). *Reaching the sustainable development goals through better local-level data: A case study of Lumajang and Pacitan districts in Indonesia*. Asian Development Bank.

Avedyan, L., Gavkalova, N., & Belyavtseva, V. (2023). The effectiveness of the development of territories in the state regional system politicians. *Financial and Credit Activity Problems of Theory and Practice*, *4*(51), 333–344. https://doi.org/10.55643/fcaptp.4.51.2023.4116

Baqir, F., Banerjee, N., & Yaya, S. (Eds.). (2021). *Better spending for localizing global sustainable development goals: Examples from the field*. Routledge.

Barbero, M. et al. (2016). *Big data analytics for policy making*. European Commission.

Borysenko, O., Kitsak, T., Pasichnyi, R., Akimova, L., Karpa, M., Akimov, O. (2022). Features of the implementation of public authority in the context of modern international security challenges: Information component. IJCSNS. *International Journal of Computer Science and Network Security, 22*(8), 123-128. DOI: 10.22937/IJCSNS.2022.22.8.16

Carrasco, B., Rahemtulla, H., & Rohdewohld, R. (2022). *Decentralization, local governance, and localizing the sustainable development goals in Asia and the Pacific*. Routledge.

Debbarma, A., & Sharma, Ch. (2023). Digital transformation in local governance: Opportunities, challenges and strategies. *International Journal of Social Science Educational Economics Agriculture Research and Technology (IJSET), 3*(1), 152-156.

Debeljak, A., & Dečman, M. (2022). Digital transformation of Slovenian urban municipalities: a quantitative report on the impact of municipality population size on digital maturity. Network of Institutes and Schools of Public Administration in Central and Eastern Europe. The NISPAcee Journal of Public Administration and Policy, 15(2), 25-51.

ElMassah, S., & Mohieldin, M. (2020). Digital transformation and localizing the Sustainable Development Goals (SDGs). *Ecological Economics, 169, 106490.*

Equey, C., Priftis, A., Trabichet, J.-Ph., Hutzli, V. (2024). Designing a digital citizen-centered service. *Technological Forecasting and Social Change, 202*, 132280.

Guadrado-Ballesteros, B., & Garca-Sanchez, I. (2017). *Local governments in the digital era: Looking for accountability.* Nova Science Pub.

Halushka, Z. Bobrovskyi, O. & Kharechko D. (2024). State policy of wellbeing in the face of global challenges: Problems of socialization, socio-economic transformation against the background of the introduction of digitalization and artificial intelligence technologies. *Ad Alta: Journal of interdisciplinary research*, 14(01), XLI, 195-200. https://doi.org/10.33543/j.140141.195200

Karpa, M., Kitsak, T., Domsha, O., Zhuk, O., & Akimov, O. (2023) Artificial Intelligence as a tool of public management of socio-economic development: Economic systems, smart infrastructure, digital systems of business analytics and transfers. *Ad Alta: Journal of Interdisciplinary Research, 13*(01), XXXIV, 13-20. DOI: 10.33543/1301341320

Kawtar, B., & Khadija, B. (2024). Harnessing AI for public administration: A literature review on opportunities, challenges, and strategic implementation. *International Journal of Economic Studies and Management (IJESM), 4*(4), 794–817.

Klievink, B., Romijn, B., Cunningham, S. & Bruijn, H. (2016). *Big data in the public sector: Uncertainties and readiness*. Information Systems Frontiers.

Koshova, S., Lytvynova, L., & Kaliuzhna, S. (2022). Regulatory and legal aspects of information support for the provision of administrative services in the field of public administration as a communicative culture of a public servant. *IJCSNS. International Journal of Computer Science and Network Security, 22*(9), 595-600. DOI: 10.22937/IJCSNS.2022.22.9.77

Kulikov, P., Anin, O., Vahonova, O., & Niema, O., (2022). Scientific and applied tools for project management in a turbulent economy with the use of digital technologies. *IJCSNS. International Journal of Computer Science and Network Security, 22*(9), 601-606. DOI: 10.22937/IJCSNS.2022.22.9.78

Latupeirissa, J., Dewi, N., Prayana, I., Srikandi, M., Ramadiansyah, S., Pramana, I. (2024). Transforming public service delivery: A comprehensive review of digitization initiatives. *Sustainability, 16*(7), 2818.

Liubkina, O., & Murovana, T. (2019). Financial instruments of stimulating innovative activities of enterprises and its improvements. *Marketing and Management of Innovations,* 4, 336-352. DOI: 10.21272/MMI.2019.4-26

Lowman, M. (2017). *A practical guide to analytics for governments: Using Big Data for good*. Wiley.

Lukashev, S., Avedyan, L., & Akimov, O. (2022). Functioning of united territorial communities and identification of main problems of organizational support of local budget management. *Financial and Credit Activity Problems of Theory and Practice*, *2*(43), 107–117. https://doi.org/10.55643/fcaptp.2.43.2022.3708

Matheus, R., Janssen, M. & Maheshwari, D. (2020). *Data science empowering the public: Data-driven dashboards for transparent and accountable decision-making in smart cities*. Government Information Quarterly, 37(3), 101284.

Nguyen, H. (2024). Educating a new generation: blending traditional and contemporary standards for Vietnamese youth. *Cadernos de Educação Tecnologia e Sociedade, 17*(2). https://brajets.com/index.php/brajets/article/view/1587

Ribeiro, J., Remoaldo, P., Nunes, F., Lopes, H., Vareiro, L. (Eds.). (2024). *Sustainable development of territories in contexts of uncertainty: External shocks and risks*. Cambridge University Press.

Richards, G. (2017). B*ig Data and analytics applications in government: Current practices and future opportunities*. CRC Press.

Rogge, N., Agasisti, T. & De Witte, K. (2017). *Big data and the measurement of public organizations' performance and efficiency: The state-of-the-art.* Public Policy and Administration.

Sundberg, L., & Holmström, J. (2024). Citizen-centricity in digital government research: A literature review and integrative framework. *Information Polity, 29*, 55–72.

Symons, T. (2016). *Datavores of Local Government: Using data to make services more personalised, effective and efficient.* Nesta.

Territorial approaches for sustainable development (2023). White Paper for Policy Formulation and Project Implementation. European Commission.

Therborn, G. (2017). *Cities of power the urban, the national, the popular and the global*. Verso.

Vasylevska, T., Shevchenko, S., Sydorenko, N., Gradivskyy, V., Akimova, L., & Akimov, O. (2022). Development of professional competence of public servants in the conditions of decentralization of public authority. *Ad Alta: Journal of Interdisciplinary Research, 12*(2), XXIX, 61-66.

World Bank (2015). *Big Data solutions: Innovative approaches to overcoming agricultural challenges in developing nations by harnessing the power of analytics*. WB Group, Washington DC.

Xavier, M., Nunes, A., & Alves, L. (2024). What do Contemporary Publications Report about the Generation of Urban Solid Waste (MSW) and/or Consumption from the Perspective of Chemistry Teaching? *Cadernos de Educação Tecnologia e Sociedade, 17*(2). https://doi.org/10.14571/brajets.v17.n2.561-576

Yang, C., Gu, M., & Albitar, K. (2024). Government in the digital age: Exploring the impact of digital transformation on governmental efficiency. *Technological Forecasting and Social Change, 208*, 123722.

Ylinen, M., & Pekkola, S. (2019). A process model for public sector IT management to answer the needs of digital transformation. Proceedings of the 52nd Hawaii International Conference on System Sciences, pp. 6219-6228.

Zahorskyi, V., Bobrovskyi, O., Bondarenko, D., & Karpa, M. (2022). Ensuring Information Security in the System of Public Management of Sustainable Development of the Region: EU Experience. *IJCSNS. International Journal of Computer Science and Network Security.* 22(8), 163-168. DOI: 10.22937/IJCSNS.2022.22.8.21

Zilinska, A.S. Gavkalova, N.L. Avedyan, L.Y., & Kyrychenko, Y.V. (2022). Efficiency in the context of ensuring sustainable territorial development. *Financial and Credit Activity Problems of Theory and Practice*, *4*(45), 234–243. DOI: 10.55643/fcaptp.4.45.2022.3830