BABEȘ-BOLYAI UNIVERSITY

FACULTY OF ECONOMICS AND BUSINESS ADMINISTRATION

DOCTORAL SCHOOL OF ECONOMICS AND BUSINESS ADMINISTRATION

DOCTORAL THESIS SUMMARY

THE IMPACT OF DIGITALIZATION ON SMART CITIES AND SMART VILLAGES

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TABLE OF CONTENTS OF THE DOCTORAL THESIS

KEY WORDS

digitalization, smart city, smart village, sustainability, management, local administration.

1. Introduction and Research Focus:

This thesis critically explores the intersection of digitalization and governance, with a concentrated focus on the implementation and implications of the smart city and smart village frameworks within Romanian municipalities. The research undertakes a multi-faceted examination of how digital infrastructure, innovation, and policy coalesce to reshape urban and rural governance systems. It posits that the smart city/village framework, beyond being a technological or administrative upgrade, signifies a fundamental shift in governance paradigms, fostering a move towards more efficient, sustainable, and citizen-centric municipalities. Through an integrative theoretical and practical approach, the study advances the discourse on how local governments can adapt to and harness digitalization, particularly in a post-pandemic context where the digital divide has become more pronounced.

2. Research Objectives and Theoretical Contributions:

1. **Comprehensive Theoretical Framework:** The first aim of the research is to delineate a robust theoretical framework that synthesizes the disparate literature on digitalization and smart city models. By critically examining the definitions, components, and theoretical underpinnings of smart city and smart village concepts, the thesis establishes a cohesive narrative that aligns these frameworks with broader trends in urban and rural transformation. The study reviews how global cities have adopted digital solutions and positions Romanian localities within this global discourse.
2. **Transnational and Local Case Studies:** The second objective is to provide a comparative case study analysis that juxtaposes international best practices in smart city implementation with Romanian experiences. The research focuses on identifying commonalities and differences between developed smart city initiatives and emerging projects in Romania, with the goal of offering actionable insights for local governments. This comparative analysis is informed by the specific socio-economic and political conditions within which these cities operate, paying particular attention to funding mechanisms, governance structures, and digital infrastructure.
3. **Perception and Cognitive Dimensions:** A crucial component of the study involves assessing the cognitive and perceptual dimensions of smart city/village initiatives among key stakeholders in Romanian local administrations. This investigation is grounded in qualitative interviews with mayors, civil servants, and project managers responsible for the implementation of smart initiatives. By exploring the subjective interpretations and

challenges perceived by these individuals, the research sheds light on the human factors influencing the success or failure of digitalization efforts in municipalities.

4. **Evaluating Implementation and Knowledge Levels:** The fourth objective is to empirically examine the relationship between the level of understanding of the smart city framework within local governments and the actual implementation of smart projects. The study posits that the six key components of the smart city framework (Smart Government, Smart People, Smart Economy, Smart Environment, Smart Infrastructure, Smart Living) serve as the foundation for successful implementation but are contingent on the knowledge and capacity of public servants to operationalize these concepts within their communities.

3. Theoretical Foundation and Literature Review:

The thesis begins with an exhaustive literature review that maps the evolution of digitalization and smart city frameworks from their conceptual origins to their contemporary applications. The theoretical exploration is divided into three main strands:

- **Historical Evolution of Digitalization:** A detailed exploration of the historical development of digitalization, from its initial emergence as a tool for automating administrative functions to its current role as a driver of socio-economic change. The study explores how digitalization has been conceptualized as a catalyst for innovation, efficiency, and inclusivity in urban planning.
- **Theoretical Constructs of Smart Cities and Villages:** This section provides a comprehensive review of the smart city and smart village paradigms, discussing various scholarly definitions, frameworks, and debates. It highlights the growing importance of digital technologies in urban and rural governance, noting how smart cities are seen as hubs of innovation and sustainability. Smart villages, though less discussed in the literature, are presented as an emerging model with significant potential, particularly in contexts like Romania where rural development is critical.
- **Key Components and Indicators of Smart Cities:** The study synthesizes the diverse indicators used to assess smart cities, focusing on the six core components (Smart Government, Smart People, Smart Economy, Smart Environment, Smart Infrastructure, and Smart Living). It reviews how these components interact to create a holistic ecosystem where digitalization improves governance, fosters economic growth, and enhances quality of life.

4. Case Study Analysis:

In the practical component, the thesis presents an in-depth comparative analysis of smart city implementations both globally and in Romania:

- **International Case Studies:** The thesis examines 22 international smart cities, including renowned examples such as Singapore, Barcelona, and Amsterdam, which

have become benchmarks for smart governance. These cities are analyzed through the lens of their digital strategies, governance innovations, and public-private partnerships. The study identifies best practices, such as the role of data-driven decision-making, citizen engagement platforms, and integrated digital infrastructure, which have been pivotal in these cities' success.

- **Romanian Case Studies:** The analysis then shifts focus to Romania, presenting detailed case studies of cities such as Cluj-Napoca, Alba Iulia, and Iași. These case studies explore how Romanian municipalities have leveraged European funding, such as the Recovery and Resilience Plans, to implement smart city/village projects. However, the thesis highlights the stark disparity between urban and rural implementations, with rural areas often lacking the necessary infrastructure and skilled personnel to fully realize the potential of smart technologies.

5. Methodological Approach:

The thesis employs a mixed-methods research design to triangulate data from various sources. The qualitative component consists of semi-structured interviews with key stakeholders in Romanian local governments, while the quantitative component uses survey data to assess the knowledge and implementation levels of smart city projects. Data from the interviews were analyzed using VOSviewer and Voyant Tools, enabling the creation of co-occurrence networks and thematic visualizations. The quantitative data, collected through a questionnaire distributed to public servants, was processed using the fuzzy-set Qualitative Comparative Analysis (fsQCA) method. This enabled the identification of causal relationships between smart city components, public servant knowledge, and project implementation outcomes.

6. Key Findings and Theoretical Implications:

1. **Digitalization as a Catalyst for Governance Transformation:** The findings reveal that digitalization, when integrated into a coherent smart city strategy, acts as a catalyst for transformative governance. The research underscores that municipalities that adopt a citizen-centric approach, supported by digital platforms for transparency, participation, and service delivery, experience significant improvements in governance efficiency and public trust.
2. **Challenges in Rural Digitalization:** The research identifies significant challenges in the implementation of smart village initiatives, particularly in rural Romania, where infrastructural deficits and limited access to skilled labor hinder progress. While European funding presents an opportunity for addressing these gaps, the study suggests that without targeted capacity-building initiatives, rural areas may struggle to keep pace with urban digitalization efforts.

3. **Institutional and Bureaucratic Barriers:** Bureaucratic inertia and institutional silos within local administrations were found to be major impediments to the successful implementation of smart city initiatives. The thesis argues for a more integrated and cross-departmental approach to governance, facilitated by digital platforms that allow for better coordination and resource management.

4. **The Role of Public Servants in Implementation:** The study highlights a direct correlation between the knowledge level of public servants regarding the smart city framework and the degree of project implementation. Municipalities where public servants had received training in digital technologies were more successful in implementing complex smart projects.

7. Policy Recommendations and Managerial Implications:

The thesis provides a series of policy recommendations for both local and central governments:

- **Enhancing Digital Literacy:** Municipalities should invest in the continuous training of public servants to ensure they are equipped to manage and implement smart city projects. This is particularly important in rural areas, where recruitment challenges make it difficult to attract qualified personnel.
- **Building Digital Infrastructure:** The research emphasizes the importance of developing robust and scalable digital infrastructures, especially in rural areas where connectivity remains a significant barrier. High-speed internet access is foundational for the success of smart village projects.
- **Leveraging Public-Private Partnerships:** The study advocates for the use of public-private partnerships to supplement public funding for smart initiatives. Private sector expertise in technology deployment and innovation can help local governments overcome financial and technical challenges.

8. Future Research and Limitations:

The dissertation acknowledges certain limitations, particularly in the scope of the case study selection and the focus on Romanian municipalities. Future research could expand the geographic scope to include a more diverse range of cities and rural areas across Europe and globally, allowing for more comprehensive cross-national comparisons. Moreover, future studies could examine additional variables influencing smart city success, such as political leadership, civic engagement, and private sector involvement.

9. Conclusion:

This research provides a foundational framework for understanding how digitalization can be harnessed to transform governance through smart city and smart village initiatives. It offers

both theoretical contributions to the academic discourse on digital governance and practical recommendations for local governments seeking to navigate the complexities of digital transformation. By synthesizing theoretical insights with real-world examples, the thesis not only advances scholarly understanding but also provides actionable strategies for policymakers and public servants committed to fostering more resilient, sustainable, and inclusive municipalities.

REFERENCES

Administrative Code of Romania (regulated by the Government Emergency Ordinance (GEO) no. 57/2019, amended)

Agenția pentru Dezvoltare Regională Centru, 2022. *Noutăți pentru îmbunătățirea implementării proiectelor Por 2014-2020 și Stadiul Programului operațional regional 2021-2027*. Agenția pentru Dezvoltare Regională Centru. [Online]. Available at: http://www.adrcentru.ro/comunicare/noutati-pentru-imbunatatirea-implementarii-proiectelor-por-2014-2020-si-stadiul-programului-operational-regional-2021-2027/ [Accessed: 27 May 2023].

Ahmed, A. H., & Fragonara, L. Z. (2021). Adaptive intelligent traffic control systems for improving traffic quality and congestion in Smart Cities. International Journal for Quality Research, 15(1), pp. 139–154. doi:10.24874/ijqr15.01-08

Albino, V., Berardi, U. and Dengelico, R.M, 2015. Smart cities: Definitions, Dimensions, Performance, and Initiatives, Journal of Urban Technology, 22(1), pp. 3-21.

Amsterdam Economic Board, 2022. Smart Health Amsterdam. Amsterdam Economic Board. URL https://amsterdameconomicboard.com/en/initiative/smart-health-amsterdam/ (accessed 10.20.22).

Amsterdam Smart City, 2022. Amsterdam Smart City. URL https://amsterdamsmartcity.com/ (accessed 11.10.22).

Angelidou, M., 2015. Smart cities: A conjuncture of four forces, Cities, 47, pp.95–106.

Anthopoulos, L. G., & Reddick, C. G. (2016). Smart city and smart government: Synonymous or complementary?. In Proceedings of the 25th International Conference Companion on World Wide Web, pp. 351-355.

Anthopoulos, L., 2017. *Smart utopia vs smart reality: Learning by experience from 10 Smart City cases*. Cities, 63, pp. 128–148. doi:10.1016/j.cities.2016.10.005.

Anthopoulos, L.G., 2015. Understanding the smart city domain: A literature review. Transform. City Gov. Success. Smart Cities 4, 9–21.

Apostolache, M.C. (2015) 'Relevant jurisprudential aspects from the practice of the Constitutional Court of Romania on local public administration', *Acta Universitatis George Bacovia. Juridica*, 4(2), pp. 488–510. Available at: https://www.ugb.ro/Juridica/Issue_no8.pdf (Accessed: 13 February 2024).

Arroub, A. Zahi, B., Sabir, E. and Sadik, M., 2016. A literature review on Smart Cities: Paradigms, opportunities and open problems, 2016 International Conference on Wireless Networks and Mobile Communications (WINCOM), pp. 180–186.

Arroub, A. Zahi, B., Sabir, E. and Sadik, M., 2016. *A literature review on Smart Cities: Paradigms, opportunities and open problems*. 2016 International Conference on Wireless Networks and Mobile Communications (WINCOM), pp. 180–186.

Asociația Cluj IT, 2021. *STRATEGIA SMART CITY A MUNICIPIULUI ALBA IULIA 2021-2030*. Primaria Alba Iulia. [Online]. Available at: https://www.apulum.ro/images/uploads/fisiere/Strategia_Smart_City_a_Municipiului_Alba_Iulia_2021-2030.pdf [Accessed: 26 May 2023].

Bai, C., Dallasega, P., Orzes, G., and Sarkis, J. (2020). Industry 4.0 technologies assessment: A sustainability perspective. International Journal of Production Economics, 229, p. 107776. doi:10.1016/j.ijpe.2020.107776

Bakıcı, T., Almirall, E., Wareham, J., 2013. A smart city initiative: The case of Barcelona. J. Knowl. Econ 135–148.

Balsmeier, B., and Woerter, M. (2019). Is this time different? how digitalization influences job creation and destruction. Research Policy, 48, p. 103765. doi:10.1016/j.respol.2019.03.010+

Barcelona City Hall, 2022. Environment and sustainability. Barcelona. URL https://www.barcelona.cat/en/living-in-bcn/environment-and-sustainability (accessed 11.25.22).

Baron, M. and Kuźnik, F. (2017) 'Economic basis for functioning of a smart city', Studia Regionalia, 51, pp. 83–103. doi:10.12657/studreg-51-06.

Belli, L., Cilfone, A., Davoli, L., Ferrari, G., Adorni, P., Di Nocera, F., Dall'Olio, A., Pellegrini, C., Mordacci, M. and Bertolotti, E., 2020. IOT-enabled Smart Sustainable Cities: Challenges and approaches, Smart Cities, 3(3), pp.1039–1071.

Bertschek, I., Cerquera, D., & Klein, G. J. (2013). More bits–more bucks? Measuring the impact of broadband internet on firm performance. Information Economics and Policy, 25(3), pp. 190-203.

Bibri, S.E. and Krogstie, J., 2020. *The emerging data–driven smart city and its innovative applied solutions for sustainability: The cases of London and Barcelona.* Energy Informatics, 3(1). doi:10.1186/s42162-020-00108-6.

Bibri, S.E., Krogstie, J., 2020. The emerging data–driven Smart City and its innovative applied solutions for sustainability: the cases of London and Barcelona. Energy Informatics 3, 1–42. https://doi.org/10.1186/s42162-020-00108-6

Biswas, S., Nath, A. and Pal, A., 2023. Smart Cities and Associated Solid Waste, Biomedical Waste, E-Waste Issues, and Management. In Chatterjee, U., Antipova, A., Ghosh, S., Majumdar, S. and Setiawati, M.D. (Eds.), Urban Environment and Smart Cities in Asian Countries, Human Dynamics in Smart Cities, Switzerland, Springer Cham

Blazek, R., Durana, P., Jaros, J., 2022. How the V4 Nations Handle the Idea of Smart Cities. Information 13, 570. https://doi.org/10.3390/info13120570

Boc, E., 2022. *Cluj-Napoca Green.Digital.Resilient*. European Committee of the regions. [Online]. Available at: https://cor.europa.eu/en/our-work/Documents/boc.pdf [Accessed: 30 May 2023].

Bokolo Jnr, A., 2021. A case-based reasoning recommender system for Sustainable Smart City Development, AI & SOCIETY, 36(1), pp.159–183.

Bolívar, M.P. and López-Quiles, J.M. (2018) 'The quest for the quality of life in European Smart cities', Proceedings of the 19th Annual International Conference on Digital Government Research: Governance in the Data Age, pp. 1–15. doi:10.1145/3209281.3209296.

Brčić, D., Slavulj, M., Šojat, D., & Jurak, J. (2018). The role of smart mobility in smart cities. Proceedings of the 5th International Conference on Road and Rail Infrastructure, 1601–1606. doi:10.5592/co/cetra.2018.812

Broccardo, L., Zicari, A., Jabeen, F., and Bhatti, Z. A. (2023). How digitalization supports a sustainable business model: A literature review. Technological Forecasting and Social Change, 187, p. 122146. doi:10.1016/j.techfore.2022.122146

Büchi, G., Cugno, M., & Castagnoli, R. (2020). Smart Factory Performance and Industry 4.0. Technological Forecasting and Social Change, 150, 119790. doi:10.1016/j.techfore.2019.119790

Business development, HealthHUB, Hospital District of Tampere Region, 2022. Health and well-being. URL https://smarttampere.fi/en/network/health-and-well-being/ (accessed 11.20.22).

Butnariu, A.R., Gusul, P.F., 2021. Public Innovation in Romania: Financing Smart City Initiatives Using European Funds in Small and Medium Sized Cities. "Ovidius" University Annals, Economic Sciences Series 221, 86–94.

Campisi, T., Severino, A., Al-Rashid, M. A., & Pau, G. (2021). The development of the smart cities in the connected and autonomous vehicles (cavs) ERA: From Mobility Patterns to scaling in cities. Infrastructures, 6(7), p. 100. doi:10.3390/infrastructures6070100

Caragliu, A., Del Bo, C. and Nijkamp, P., 2011. *Smart Cities in Europe*. Journal of Urban Technology, 18(2), pp. 65-82.

Caragliu, A., Del Bo, C., Nijkamp, P., 2021. Smart Cities in Europe. J. Urban Technol. 18, 65–82.

Castelnovo, W. (2016). Co-production makes Cities Smarter: Citizens' participation in Smart City Initiatives. Co-Production in the Public Sector, 97–117. doi:10.1007/978-3-319-30558-5_7

CatalanNews, 2018. Barcelona hospital unveils smart Intensive Care Unit. CatalanNews.

Chang, S. and Smith, M.K. (2023) 'Residents' quality of life in smart cities: A systematic literature review', Land, 12(4), p. 876. doi:10.3390/land12040876.

Chanias, S. (2017). Mastering digital transformation: the path of a finan- cial services provider towards a digital transformation strategy. Proceedings of the 25th European Conference on Information Systems (ECIS), 17.

Chatfield, A. T., & Reddick, C. G. (2019). A framework for internet of things-enabled smart government: A case of IOT cybersecurity policies and use cases in U.S. federal government. Government Information Quarterly, 36(2), pp. 346–357. doi:10.1016/j.giq.2018.09.007

Chen, X. (2022) 'Machine Learning Approach for a circular economy with waste recycling in Smart Cities', Energy Reports, 8, pp. 3127–3140. doi:10.1016/j.egyr.2022.01.193.

Chen, Y., Ardila-Gomez, A., & Frame, G. (2017). Achieving Energy Savings by intelligent transportation systems investments in the context of Smart Cities. Transportation Research Part D: Transport and Environment, 54, pp. 381–396. doi:10.1016/j.trd.2017.06.008

Chourabi, H., Nam, T., Walker, S., Gil-Garcia, J.R., Mellouli, S., Nahon, K., Pardo, T.A., Scholl, H.J., 2012. Understanding smart cities: An integrative framework, in: Proceedings of the 2012 45th Hawaii International Conference on System Science. Maui, Hi, USA, pp. 2289–2297.

Ciesielska, M., Rizun, N. and Chabik, J., 2022. Assessment of E-government inclusion policies toward seniors: A framework and case study, Telecommunications Policy, 46(7), p. 102316.

Cities for Digital Rights, 2022. Métropole Nice Côte d'Azur (MNCA) is investing in new innovation sectors with high job-creation potential to assert itself as a digital, smart, safe and sustainable territory. URL https://citiesfordigitalrights.org/city/nice (accessed 11.2.22).

City of Chicago, 2022. Environment and Sustainability. URL https://www.chicago.gov/city/en/progs/env.html (accessed 10.16.22).

City of Melbourne, 2022. Melbourne as a smart city. URL https://www.melbourne.vic.gov.au/about-melbourne/melbourne-profile/smart-city/Pages/smart-city.aspx (accessed 11.12.22).

City of Tampere, 2022. Smart Tampere. URL https://smarttampere.fi/en/home/ (accessed 10.25.22).

Clerck, J., 2017. Digitalization, Digital Transformation: The Differences. i-SCOOP.

Council of Europe (2014) Structure and Operation Report of Local and Regional Democracy - Romania. Available at: https://rm.coe.int/16807471c6 (Accessed: 11 February 2024).

Daga, E., 2022. MK:SMART Data Hub. MK:SMART. URL https://www.mksmart.org/data/ (accessed 11.2.22).

Dalenogare, L. S., Benitez, G. B., Ayala, N. F., & Frank, A. G. (2018). The expected contribution of Industry 4.0 Technologies for Industrial Performance. International Journal of Production Economics, 204, pp. 383–394. doi:10.1016/j.ijpe.2018.08.019

Dameri, R.P. and Cocchia, A., 2013. *Smart City and Digital City: Twenty Years of Terminology Evolution*. X Conference of the Italian Chapter of AIS, ITAIS, pp. 1-8.

DC Health Link, 2023. DC Health Link. URL https://www.dchealthlink.com/ (accessed 10.20.23).

DC Health, 2023. DC Health. URL https://dchealth.dc.gov/ (accessed 10.21.23).

Demertzi, V., Demertzis, S. and Demertzis, K., 2023. *An Overview of Cyber Threats, Attacks and Countermeasures on the Primary Domains of Smart Cities*. Applied Sciences, 13(2), p. 790. doi:10.3390/app13020790.

Department of Energy & Environment, 2021. Sustainable DC. Sustainable DC. URL https://sustainable.dc.gov/

Devereux, M., Vella, J., 2018, Debate: implications of digitalization for international corporate tax reform. Intertax 46(6), pp. 550–559.

Dewalska–Opitek, A. (2014). Smart city concept–the citizens' perspective. In Telematics-Support for Transport: 14th International Conference on Transport Systems Telematics, TST 2014, Katowice/Kraków/Ustroń, Poland, October 22-25, 2014. Selected Papers, 14,. Springer Berlin Heidelberg, pp. 331-340.

Drohojowska, H., 1995. San-Francisco style, art-deco elements inform a Smart city residence+ interior-design by Arnold, Val. Architectural Digest 48, 114–121.

Důbravová, H., Bureš, V., 2023. Smart City Information Systems: Research on Information Published for Citizens and Design of Effective Content in the Czech Republic. Smart Cities 6, 2960–2981. https://doi.org/10.3390/smartcities6050133

Důbravová, Hana, and Vladimír Bureš. 2023. "Smart City Information Systems: Research on Information Published for Citizens and Design of Effective Content in the Czech Republic" Smart Cities 6, no. 5: 2960-2981. https://doi.org/10.3390/smartcities6050133

Eling, M., Lehmann, M., 2018. The impact of digitalization on the insurance value chain and the insurability of risks. Geneva Pap. R. I.-ISS 43(3), pp. 359–396.

Eluwole, K.K. et al. (2024) 'Application of fuzzy-set qualitative comparative analysis (fsQCA) in Hospitality and Tourism Research: A bibliometric study', Journal of

Hospitality and Tourism Insights, ahead-of-print(ahead-of-print). doi:10.1108/jhti-08-2023-0572.

Emerging Europe (2023) The Business-Friendly Cities of 2023 report, Emerging Europe. Available at: https://646395.fs1.hubspotusercontent-na1.net/hubfs/646395/Reports%202023/Emerging%20Europe%20-%20Business-Friendly%20Cities%202023%20Report.pdf (Accessed: 12 May 2024).

eMIP, 2022. *Digitalization through PNRR (National Recovery and Resilience Program)*. Edited by MIP. [Online]. Available at: https://www.emip.ro/en/post/digitization-through-pnrr [Accessed: 15 June 2023].

Engelbert, J., van Zoonen, L. and Hirzalla, F., 2019. *Excluding Citizens from the European Smart City: The Discourse Practices of Pursuing and Granting Smartness*. Technological Forecasting and Social Change, 142, pp. 347-353.

European Commission (2023) Report on the quality of life in European cities, 2023, European Commission. Available at: https://ec.europa.eu/regional_policy/sources/reports/qol2023/2023_quality_life_european_cities_en.pdf (Accessed: 10 May 2024).

European Commission, 2020. Digital Agenda for Europe. Smart Cities: A Europe 2020 Initiative [WWW Document]. European Comission. URL https://ec.europa.eu/info/eu-regional-and-urban-development/topics/cities-and-urban-development/city-initiatives/smart-cities_en (accessed 3.8.23).

European Commission, 2023. Smart cities, Available at: https://commission.europa.eu/eu-regional-and-urban-development/topics/cities-and-urban-development/city-initiatives/smart-cities_en (Accessed: April 10, 2023).

European Parliament, 2014. *Mapping Smart Cities in the EU*. European Parliament [Online]. Available at: http://www.europarl.europa.eu/RegData/etudes/etudes/join/2014/507480/IPOL-ITRE_ET%282014%29507480_EN.pdf [Accessed: 10 June 2023]

Ferronato, P., and Ruecker, S. (2018) Smart Citizenship: designing the interaction between citizens and smart cities, in Storni, C., Leahy, K., McMahon, M., Lloyd, P. and Bohemia, E. (eds.), Design as a catalyst forchange - DRS International Conf erence 2018, 25-28 June, Limerick, Ireland. https://doi.org/10.21606/drs.2018.480

Fialová, J., Bamwesigye, D., Łukaszkiewicz, J., Fortuna-Antoszkiewicz, B., 2021. Smart Cities Landscape and Urban Planning for Sustainability in Brno City. Land 10, 870. https://doi.org/10.3390/land10080870

Finkelstein, J., & Newman, D. (1984). The Third Industrial Revolution: A Special Challenge to managers. Organizational Dynamics, 13(1), 53–65. doi:10.1016/0090-2616(84)90031-7

Florea, D., Cardasim, F. and Bonghiu , C.I., 2019. *Digital Transformation Strategy for the city of Iaşi - Iaşi, a growing digital powerhouse built on skills and entrepreneurship*. DIGITAL CITIES CHALLENGE. [Online]. Available at: https://www.intelligentcitieschallenge.eu/sites/default/files/2019-07/Digital_transformation_strategy_IASI.pdf [Accessed: 03 June 2023].

Fonseca, F., Fernandes, E., Ramos, R., 2022. Walkable Cities: Using the Smart Pedestrian Net Method for Evaluating a Pedestrian Network in Guimarães, Portugal. Sustainability 14, 10306.

Frank, A. G., Dalenogare, L. S., and Ayala, N. F. (2019). Industry 4.0 technologies: Implementation patterns in manufacturing companies. International Journal of Production Economics, 210, pp. 15–26. doi:10.1016/j.ijpe.2019.01.004

Frenzel, A.,, Muench, J.,, Bruckner, M., and Veit, D., 2021. Digitization or digitalization? – Toward an understanding of Digitization or digitalization? – Toward an understanding of de. In: AMCIS Proceedings. 18. pp.1–9.

Gaglio, C., Kraemer-Mbula, E., and Lorenz, E. (2022). The effects of digital transformation on innovation and productivity: Firm-level evidence of South African Manufacturing Micro and Small Enterprises. Technological Forecasting and Social Change, 182, p. 121785. doi:10.1016/j.techfore.2022.121785

Ganguly, P., Nasipuri, M., Dutta, S., 2019. Challenges of the existing security measures deployed in the smart grid framework, in: Proceedings of the 2019 IEEE 7th International Conference on Smart Energy Grid Engineering (SEGE). Oshawa, ON, Canada, pp. 1–5.

Gebre-Mariam, M., Bygstad, B., 2019. Digitalization mechanisms of health management information systems in developing countries. Inf. Organ. 29(1), pp. 1–22.

Geneva Digital Health Hub, 2022. Geneva Digital Health Hub (gdhub). URL https://gdhub.org/ (accessed 11.1.22).

Gharehbaghi, K., McManus, K., Hurst, N., Robson, K., Pagliara, F., & Eves, C. (2023). Advanced rail transportation infrastructure as the basis of improved urban mobility: Research into Sydney as a smart city. Australian Planner, 59(2), pp. 101–116. doi:10.1080/07293682.2023.2202867

Ghobakhloo, M. (2018). The future of manufacturing industry: A strategic roadmap toward industry 4.0. Journal of Manufacturing Technology Management, 29(6), pp. 910–936. doi:10.1108/jmtm-02-2018-0057

Ghobakhloo, M. (2020). Industry 4.0, digitization, and opportunities for Sustainability. Journal of Cleaner Production, 252, p. 119869. doi:10.1016/j.jclepro.2019.119869

Giffinger, R., Gudrun, H., 2010. Smart cities ranking: An effective instrument for the positioning of the cities? ACE Arch. City Environ 4, 7–26.

Gobble, M.M., 2018. Digitalization, digitization, and Innovation. Research-Technology Management, 61(4), pp.56–59.

Gracias, J.S. et al. (2023) 'Smart cities—A structured literature review', Smart Cities, 6(4), pp. 1719–1743. doi:10.3390/smartcities6040080.

Gradillas, M., and Thomas, L.D., 2023. Distinguishing digitization and digitalization: A systematic review and Conceptual Framework. Journal of Product Innovation Management.

Greater London Authority, 2022a. London Sustainable Development Commission (LSDC). City of London. URL https://www.london.gov.uk/who-we-are/city-halls-partners/london-sustainable-development-commission-lsdc (accessed 10.20.22).

Greater London Authority, 2022b. Mission 5: Improve city-wide collaboration. URL https://www.london.gov.uk/programmes-strategies/business-and-economy/supporting-londons-sectors/smart-london/mission-5-improve-city-wide-collaboration (accessed 11.2.22).

Gregory, K., Geiger, L. and Salisbury, P. 2022. Voyant Tools and Descriptive Metadata: A Case Study in How Automation Can Compliment Expertise Knowledge, Journal of Library Metadata, 22(1-2), pp. 1-16, doi: 10.1080/19386389.2022.2030635.

Gupta, S., Mustafa, S. Z., & Kumar, H. (2017). Smart people for smart cities: A behavioral framework for personality and roles. In Advances in Smart Cities, Chapman and Hall/CRC, pp. 23-30.

Gyeonggi-do Provincial Office, 2021. Gyeonggi Province launches smart app service that shows convenience facilities for mobility impaired individuals. URL https://english.gg.go.kr/blog/daily-news/gyeonggi-province-launches-smart-app-service-that-shows-convenience-facilities-for-mobility-impaired-individuals/ (accessed 10.26.22).

Gyeonggi-do Provincial Office, 2022. Gyeonggi Province Discusses Environmental Safety and Provides Experiential Programs Through Gyeonggi Environment Safety Forum on September 5. Gyeonggi-do Provincial Office.

Ha, L. T. (2022). Effects of digitalization on financialization: Empirical evidence from European countries. Technology in Society, 68, p. 101851. doi:10.1016/j.techsoc.2021.101851

Ha, L. T., Huong, T. T., and Thanh, T. T. (2022). Is digitalization a driver to enhance environmental performance? an empirical investigation of European countries. Sustainable Production and Consumption, 32, pp. 230–247. doi:10.1016/j.spc.2022.04.002

Hagberg, J., Sundstrom, M., Egels-Zandén, N., 2016. The digitalization of retailing: an exploratory framework. Int. J. Retail Distrib. Manag. 44(7), pp. 694–712

Hao, Y., Li, Y., Guo, Y., Chai, J., Yang, C., and Wu, H. (2022). Digitalization and electricity consumption: Does internet development contribute to the reduction in electricity intensity in China? Energy Policy, 164, p. 112912. doi:10.1016/j.enpol.2022.112912

Harrison, C., Eckman, B., Hamilton, R., Hartswick, P., Kalagnanam, J., Williams, P., 2010. Foundations for Smarter Cities. IBM J. Res. Dev. 54, 1–16.

Health and Wellbeing Board, 2022. Committee details Health and Wellbeing Board. URL https://democracy.bristol.gov.uk/mgCommitteeDetails.aspx?ID=213 (accessed 10.24.23).

Health and Wellbeing Board, 2023. By 2050 everyone in Bristol will have the opportunity to live a life in which they are mentally and physically healthy. Bristol One City. URL https://www.bristolonecity.com/health-and-wellbeing/ (accessed 11.1.23).

Heavin, C., & Power, D. J. (2018). Challenges for digital transformation– towards a conceptual decision support guide for managers. Journal of Decision Systems, 27, 38–45. https://doi.org/10.1080/12460125. 2018.1468697.

Hendrigan, H. (2019). Mixing Digital Humanities and Applied Science Librarianship: Using Voyant Tools to Reveal Word Patterns in Faculty Research. Issues in Science and Technology Librarianship, (91). https://doi.org/10.29173/istl3.

Herencsar, N., 2023. Smart Consumer Healthcare Technologies. IEEE Consumer Electronics Magazine 12, 10–11. https://doi.org/10.1109/MCE.2023.3271080

Herscovici, A., Dahan, G., Cohen, G., 2022. Smart Cities and Tourism: The Case of Tel Aviv-Yafo. Sustainability 14, 10968. https://doi.org/10.3390/su141710968

Hollands, R.G., 2008. Will the real smart city please stand up? City 12, 303–320.

Ibănescu, B.-C., Bănică, A., Eva, M. and Cehan, A., 2020. *The puzzling concept of smart city in Central and Eastern Europe: A literature review designed for Policy Development*. Transylvanian Review of Administrative Sciences, 61 E, pp. 70–87. doi:10.24193/tras.61e.4.

Ibănescu, B.-C., Pascariu, G.C, Bănică, A. and Bejenaru, I., 2022. *Smart city: A critical assessment of the concept and its implementation in Romanian urban strategies*. Journal of Urban Management, 11(2), pp. 246–255. doi:10.1016/j.jum.2022.05.003.

Innovation and Technology Bureau of Hong Kong, 2020. Smart City Blueprint for Hong Kong (Blueprint 2.0).

Innovation, Technology and Industry Bureau, 2022. Hong Kong Smart City Blueprint. URL https://www.smartcity.gov.hk/ (accessed 10.15.22).

Intelligent Cities Challange, 2021. Meet the ICC city: Guimarães. The European Commission's Intelligent Cities Challange. URL

https://www.intelligentcitieschallenge.eu/news/meet-icc-city-guimaraes (accessed 11.10.23).

Intelligent Cities Challange, 2022. Brno. The European Commission's Intelligent Cities Challange. URL https://www.intelligentcitieschallenge.eu/cities/brno (accessed 10.10.22).

International Living, 2022. Guimarães: "The Cradle City of Portugal." International Living. URL https://internationalliving.com/countries/portugal/guimaraes-portugal/ (accessed 10.25.22).

Jackson-Obot, I., 2022. London in top 10 of world's most sustainable cities. Financial Times Adviser.

Jayasena, N.S., Chan, D.W.M. and Kumaraswamy, M., 2020. A systematic literature review and analysis towards developing PPP models for delivering smart infrastructure, Built Environment Project and Asset Management, 11(1), pp. 121–137.

José, Rui, and Helena Rodrigues. 2024. "A Review on Key Innovation Challenges for Smart City Initiatives" Smart Cities 7, no. 1: 141-162. https://doi.org/10.3390/smartcities7010006

Joshi, M., Vaidya, A., & Deshmukh, M. (2017). Sustainable Transport Solutions for the concept of Smart City. Energy, Environment, and Sustainability, 21–42. doi:10.1007/978-981-10-7509-4_3

Karanasios, S., Cooper, V., Adrot, A. and Mercieca, B., 2020. Gatekeepers rather than helpless: An exploratory investigation of seniors' use of information and communication technology in critical settings, Proceedings of the 53rd Hawaii International Conference on System Sciences, pp. 3770–3379.

Kasilingam, S., Keepers, M. and Wuest, T. (2021) 'A bibliometric analysis of physics-based and data-driven hybrid modeling', Procedia CIRP, 103, pp. 49–54. doi:10.1016/j.procir.2021.10.007.

Khatoun, R. and Zeadally, S., 2016. Smart Cities: Concepts, Architectures, Research Opportunities, Communications of the ACM, 59(8), pp. 46-57.

Kinelski, G., 2022. Smart City 4.0 as a Set of Social Synergies, Polish Journal of Management Studies, 26(1), pp. 92-106.

Kirimtat, A., Krejcar, O., Kertesz, A. and Tasgetiren , M. F. 2020. Future trends and current state of Smart City Concepts: A survey, IEEE Access, 8, pp. 86448–86467.

Kolbay, G., 2023. *Cum Poți Schimba Lumea: Povestea primului „smart village" Din România (video)*. *spotmedia.ro*. [Online]. Available at: https://spotmedia.ro/stiri/social/cum-poti-schimba-lumea-in-22-de-ani-povestea-ciugud-primul-smart-village-din-romania-video [Accessed: 29 May 2023].

Kollárová, M. (2022) ‘Safe smart city’, Software Engineering Perspectives in Systems, 501, pp. 325–330. doi:10.1007/978-3-031-09070-7_27.

Koman, G., Toman, D., Jankal, R., & Krúpová, S. (2024). Public transport infrastructure with electromobility elements at the Smart City level to support sustainability. Sustainability, 16(3), p. 1091. doi:10.3390/su16031091

Korean Ministry of Land, Infrastructure, and Transport, 2021. Seoul city, self-health management pilot project with smart band… 5 people recruited. Ministry of Land, Infrastructure, and Transport, Sejong-si, Republic of Korea.

Korean Ministry of Land, Infrastructure, and Transport, 2022. Gyeonggi-do, data-based infant health monitoring system, etc. to support data utilization activation. Korean Ministry of Land, Infrastructure, and Transport, Sejong-si, Republic of Korea.

Kozłowski, W. & Suwar, K. (2021). Smart City: Definitions, Dimensions, and Initiatives. European Research Studies Journal, 24(3), pp. 509-520.

KPMG, 2015. Dubai - a new paradigm for smart cities (Consulting). KPMG, Dubai.

Kraus, S., Ribeiro-Soriano, D. and Schüssler, M. (2017) ‘Fuzzy-set qualitative comparative analysis (fsQCA) in entrepreneurship and innovation research – the rise of a method’, International Entrepreneurship and Management Journal, 14(1), pp. 15–33. doi:10.1007/s11365-017-0461-8.

Kumar, H., Singh, M. K., & Gupta, M. P. (2018). Smart mobility. Proceedings of the 11th International Conference on Theory and Practice of Electronic Governance, pp. 482–488. doi:10.1145/3209415.3209417

Kumar, H., Singh, M.K., Gupta, M.P., 2016. Smart Governance for Smart Cities: A Conceptual Framework from Social Media Practices, in: Proceedings of the Social Media: The Good, the Bad, and the Ugly. Presented at the The 15th IFIP WG 6.11 Conference on e-Business, e-Services, and e-Society, I3E, Swansea, UK.

Kumar, V. and Dahiya, B., 2017. Smart economy in smart cities. In Vinod Kuma, T. M. (Eds.), Smart economy in smart cities, Advances in 21st Century Human Settlements, Singapore, Springer

Lai, C.S., Jia, Y., Dong, Z., Wang, D., Tao, Y., Lai, Q.H., Wong, R.T.K., Zobaa, A.F., Wu, R. and Lai, L.L., 2020. A Review of Technical Standards for Smart Cities, Clean Technologies, 2(3), pp.290–310.

Lapão, V., Correia, J.C., Jevtic, M., 2023. Public Health Framework for Smart Cities within the Comprehensive Approach to Sustainability in Europe: Case Study of Diabetes. Sustainability 15, 4269. https://doi.org/10.3390/su15054269

Law on Free Access to Information of Public Interest (Law No. 544/2001)

Legner, C., Eymann, T., Hess, T., Matt, C., Böhmann, T., Drews, P., Mädche, A., Urbach, N., & Ahlemann, F. (2017). Digitalization: Opportunity and challenge for the business and information systems engineering community. Business & Information Systems Engineering, 59(4), 301–308. https://doi.org/10.1007/s12599-017- 0484-2.

Lenka, S., Parida, V., Wincent, J., 2017. Digitalization capabilities as enablers of value co-creation in servitizing firms. Psychol. Market. 34(1), pp. 92–100.

Li, S., Gao, L., Han, C., Gupta, B., Alhalabi, W., and Almakdi, S. (2023). Exploring the effect of digital transformation on firms' innovation performance. Journal of Innovation & Knowledge, 8(1), p. 100317. doi:10.1016/j.jik.2023.100317

Liu, T., Mostafa, S., Mohamed, S. and Nguyen, T., 2020. Emerging themes of public-private partnership application in developing Smart City Projects: A Conceptual Framework, Built Environment Project and Asset Management, 11(1), pp. 138–156.

Local Public Administration Law (Law No. 215/2001, amended)

Lodato, T., French, E., & Clark, J. (2018). Open government data in the Smart City: Interoperability, urban knowledge, and linking Legacy Systems. Journal of Urban Affairs, 43(4), pp. 586–600. doi:10.1080/07352166.2018.1511798

Machekhina, O., 2017. Digital of education as a trend of its modernization and reforming. Revista Espacios, 38(40), pp. 26–31.

Mageto, J., Twinomurinzi, H., Luke, R., Mhlongo, S., Bwalya, K., & Bvuma, S. (2022). Building resilience into smart mobility for urban cities: An emerging economy perspective. International Journal of Production Research, pp. 1–18. doi:10.1080/00207543.2022.2139866

Martin, C., Evans, J., Karvonen, A., Paskaleva, K., Yang, D., & Linjordet, T. (2019). Smart-sustainability: a new urban fix? Sustainable Cities and Society, 45, pp. 640-648. https://doi.org/10.1016/j.scs.2018.11.028

Marx, A., Rihoux, B. and Ragin, C. (2014) 'The origins, development, and application of qualitative comparative analysis: The first 25 Years', European Political Science Review, 6(1), pp. 115–142. doi:10.1017/s1755773912000318.

Maxwell, L., and McCain, T.A., 1997. Gateway or gatekeeper: The implications of copyright and digitalization on Education. Communication Education, 46(3), pp.141–157.

Mayor's Office of New York City, 2022. Urban Sustainability. Mayor's Office of Office of Climate and Environmental Justice. URL https://www.nyc.gov/site/sustainability/initiatives/urban-sustainability.page (accessed 10.23.22).

Meijer, A., & Bolívar, M. P. R. (2016). Governing the smart city: a review of the literature on smart urban governance. International Review of Administrative Sciences, 82(2), pp.

392-408. https://2t10pjv33-y-https-doi-org.z.e-nformation.ro/10.1177/0020852314564308

Mejia, J., Manotas, E.C., Quintero, S., 2022. Analysis of the Social Capital in a Technological System of a Smart City Using a PLS-SEM Model. Sustainability 14, 11238. https://doi.org/10.3390/su141811238

Miller, A. 2018. Text Mining Digital Humanities Projects: Assessing Content Analysis Capabilities of Voyant Tools. Journal of Web Librarianship, 12(3), pp. 169-197, doi: 10.1080/19322909.2018.1479673.

Milton Keynes University Hospital, 2022. Milton Keynes University Hospital partners with Haltian to pilot new smart hospital solution. URL https://www.mkuh.nhs.uk/news/milton-keynes-university-hospital-partners-with-haltian-to-pilot-new-smart-hospital-solution (accessed 11.12.22).

Ministerul Investițiilor și Proiectelor Europene, 2021. *Planul Național de Redresare și reziliență al României (PNRR)*. Ministerul Investițiilor și Proiectelor Europene [Online]. Available at: https://mfe.gov.ro/pnrr/ [Accessed: 20 June 2023].

Ministerul Investițiilor și Proiectelor Europene, 2023. *Stadiul absorbției fondurilor UE la 31 mai 2023*. Ministerul Investițiilor și Proiectelor Europene. [Online]. Available at: https://mfe.gov.ro/stadiul-absorbtiei-fondurilor-ue/ [Accessed: 22 June 2023].

Mocholí, 2016. Smartcities' for Smart Citizens [WWW Document]. URL Smartcities' for Smart Citizens. 2016. Available online: http://anamocholi.com/smartcities-paraciudadanos-inteligentes/ (accessed 10.4.19).

Moir, E., Moonen, T. and Clark, G., 2014. *What Are Future Cities? Origins, Meanings and Uses*. Government Office for Science, Foresight [Online]. Available at: https://www.gov.uk/government/publications/future-cities-origins-meanings-and-uses [Accessed: 17 June 2023]

Morley, J., Widdicks, K., Hazas, M., 2018. Digitalisation, energy and data demand: the impact of internet traffic on overall and peak electricity consumption. Energy Res. Soc. Sci. 38(1), pp. 128–137.

Morningstar, M., 2021. Seoul Smart City. About Smart Cities. URL https://www.aboutsmartcities.com/smart-city-seoul/ (accessed 11.10.22).

Mura, P.O. and Donath, L.E. (2023). Digitalisation and Economic Growth in the European Union. Electronics 2023, 12, p. 1718, https://doi.org/10.3390/electronics12071718

New York State, 2023. New York State Trusted Issuers. URL https://covid19vaccine.health.ny.gov/new-york-state-trusted-issuers (accessed 9.20.23).

Nexus Integra, n.d. Top 10 Smart Cities in the world. Nexus Integra, Valencia, Spain.

Niu, Y., Lin, X., Luo, H., Zhang, J. and Lian, Y. (2022). Effects of digitalization on Energy Efficiency: Evidence from Zhejiang Province in China. Frontiers in Energy Research, 10. doi:10.3389/fenrg.2022.847339

Novoseltseva, E., 2020. Digital Health Ecosystem In Barcelona. Apiumhub. URL https://apiumhub.com/tech-blog-barcelona/digital-health/ (accessed 11.10.22).

Numbeo (2024) Current Safety Index by City. Available at: https://www.numbeo.com/crime/rankings_current.jsp?displayColumn=1 (Accessed: 10 May 2024).

OECD, 2020. Smart Cities and Inclusive Growth, Available at:

oecd.org/cfe/cities/OECD_Policy_Paper_Smart_Cities_and_Inclusive_Growth.pdf (Accessed: April 11, 2023).

Office de Tourisme Métropolitain Nice Côte d'Azur, 2022. Meet In Nice Côte d'Azur. URL https://www.meet-in-nicecotedazur.com/en/ (accessed 10.25.22).

Ok, J.A. and Yoo, S., 2017. *Directions and improvements of the future Smart City Development: A case of Gyenggi Province*. Spatial Information Research, 25(2), pp. 281–292. doi:10.1007/s41324-017-0092-8.

Ooms, W., Caniëls, M, Roijakkers, N. and Cobben, D., 2020. Ecosystems for smart cities: Tracing the evolution of governance structures in a Dutch smart city initiative, International Entrepreneurship and Management Journal, 16(4), pp.1225–1258.

Ortega-Fernández, A., Martín-Rojas, R. and García-Morales, V.J. (2020) 'Artificial Intelligence in the urban environment: Smart cities as models for developing innovation and Sustainability', Sustainability, 12(19), p. 7860. doi:10.3390/su12197860.

Pandey, S., Twala, B., Singh, R., Gehlot, A., Singh, A., Montero, E. C. and Priyadarshi, N., 2022. Wastewater treatment with technical intervention inclination towards Smart Cities, Sustainability, 14(18), p. 11563.

Panu, C., 2021. Adevărul Despre Alba Iulia-smart city. 106 proiecte Din Care Mai sunt doar 28: 'oraș cobai' Pentru companii care Vin Si Pleacă, Alba24. [Online]. Available at: https://alba24.ro/realitatea-despre-cele-106-proiecte-smart-city-din-alba-iulia-din-care-mai-merg-aproape-30-spatiu-de-testare-pentru-companii-879338.html [Accessed: 08 June 2023].

Pappas, I.O. and Woodside, A.G. (2021) 'Fuzzy-set qualitative comparative analysis (FSQCA): Guidelines for Research Practice in Information Systems and marketing', International Journal of Information Management, 58, p. 102310. doi:10.1016/j.ijinfomgt.2021.102310.

Parviainen, P.,, Tihinen, M.,, Kääriäinen, J., and Teppola, S., 2017. Tackling the digitalization challenge: How to benefit from digitalization in practice. International Journal of Information Systems and Project Management, 5(1), pp.63–77.

Patel, K., & McCarthy, M. P. (2000). Digital transformation: The essen- tials of E-business leadership. McGraw-Hill Professional.

Pelse, M., Strazdina, L., and Ancans, S. (2021). Digitalization in public administration institutions. Proceedings of the International Scientific Conference "Economic Science for Rural Development", 55, pp. 494–502. doi:10.22616/esrd.2021.55.051

Pereira, G. V., Macadar, M. A., Luciano, E. M., & Testa, M. G. (2016). Delivering public value through open government data initiatives in a smart city context. Information Systems Frontiers, 19(2), 213–229. doi:10.1007/s10796-016-9673-7

Polder, M., Leeuwen, G. V., Mohnen, P., & Raymond, W. (2010). Product, process and organizational innovation: drivers, complementarity and productivity effects. CIRANO-scientific publications 2010s-28.

Polyakova, V., Streltsova, E., Iudin, I., and Kuzina, L. (2024). Irreversible effects? how the digitalization of daily practices has changed after the COVID-19 pandemic. Technology in Society, 76, p. 102447. doi:10.1016/j.techsoc.2023.102447

Popova, Y. and Popovs, S. (2022) 'Impact of smart economy on smart areas and mediation effect of national economy', Sustainability, 14(5), p. 2789. doi:10.3390/su14052789.

Prebor, G. (2023), When feminism meets social networks, Library Hi Tech, 41(3), pp. 969-990. https://doi.org/10.1108/LHT-02-2021-0074.

Preda, M., Vijulie, I., Lequeux-Dincă, A.-I., Jurchescu, M., Mareci, A. and Preda, A., 2022. *How Do the New Residential Areas in Bucharest Satisfy Population Demands, and Where Do They Fall Short?*. Land, 11(6), 855, doi:10.3390/land11060855.

Primăria Cluj-Napoca (2024) Cluj-Napoca se află în primele 10 orașe din Europa în materie de calitate a vieții, Primăria Cluj-Napoca. Available at: https://primariaclujnapoca.ro/informatii-publice/comunicate/cluj-napoca-se-afla-in-primele-10-orase-din-europa-in-materie-de-calitate-a-vietii/ (Accessed: 10 May 2024).

Primăria Iași and IAȘI AI, 2023. *Iași Smart City*. [Online]. Available at: https://iasismartcity.ro/ [Accessed: 02 June 2023].

Primăria Municipiului Iași, 2023. Primăria lansează portalul Open Data. Comunicat de presă. [Online]. Available at: https://www.primaria-iasi.ro/dm_iasi/portal.nsf/pagini/primaria+lanseaza+portalul+open+data-000334DA?Open%3FOpen [Accessed: 31 May 2023].

Radicic, D., and Petković, S. (2023). Impact of digitalization on technological innovations in small and medium-sized enterprises (SMEs). Technological Forecasting and Social Change, 191, p. 122474. doi:10.1016/j.techfore.2023.122474

Ragin, C. C. (1987). The comparative method: Moving beyond qualitative and quantitative strategies. Berkeley: University of California Press.

Ragin, C. C. (2000). Fuzzy-set social science. University of Chicago Press.

Ragin, C.C. and Davey, S. 2022. Fuzzy-Set/Qualitative Comparative Analysis 4.0. Irvine, California: Department of Sociology, University of California.

Ramaprasad, A., Sánchez-Ortiz, A. and Syn, T. (2017) 'A unified definition of a smart city', In: Janssen, M., et al. Electronic Government. EGOV 2017. Lecture Notes in Computer Science, 10428, pp. 13–24. doi:10.1007/978-3-319-64677-0_2.

Reis, J., Amorim, M., Melão, N., Cohen, Y., & Rodrigues, M. (2020). Digitalization: A literature review and research agenda. Proceedings on 25th International Joint Conference on Industrial Engineering and Operations Management – IJCIEOM, 443–456. doi:10.1007/978-3-030-43616-2_47

Reis, João & Amorim, Marlene & Melao, Nuno & Matos, Patrícia. (2018). Digital Transformation: A Literature Review and Guidelines for Future Research. 10.1007/978-3-319-77703-0_41

République et canton de Genève, 2022. Genève Smart City. République et canton de Genève. URL https://www.ge.ch/dossier/smart-city#:~:text=Smart%20Geneva%20supports%20projects%20that,that%20tends%20towards%20carbon%20neutrality. (accessed 10.20.22).

Ribeiro, P., Dias, G., & Pereira, P. (2021). Transport systems and mobility for smart cities. Applied System Innovation, 4(3), p. 61. doi:10.3390/asi4030061

Rihoux, B. and Ragin, C. (2009). Configurational comparative methods: Qualitative comparative analysis (QCA) and related techniques. Sage Publications.

Ristvej, J., Lacinák, M. and Ondrejka, R., 2020. On smart city and safe city concepts, Mobile Networks and Applications, 25(3), pp.836–845.

Rotterdam Innovation City, 2022a. Life Sciences & Health 010. Rotterdam Innovation City. URL https://www.rotterdaminnovationcity.com/innovate/life-sciences-health-010/ (accessed 10.26.22).

Rotterdam Innovation City, 2022b. Smart City. Rotterdam Innovation City. URL https://www.rotterdaminnovationcity.com/smart-city/ (accessed 11.9.22).

Rotterdam Partners, 2022. Why Rotterdam: Innovative city. Rotterdam Partners. URL https://en.rotterdampartners.nl/why-rotterdam/innovative-city/ (accessed 11.20.22).

Ruggieri, R., Ruggeri, M., Vinci, G., & Poponi, S. (2021). Electric mobility in a smart city: European overview. Energies, 14(2), p. 315. doi:10.3390/en14020315

Sabbagh, K., Friedrich, R., El-Darwiche, B., Singh, M., Ganediwalla, S., Katz, R., 2012. Maximizing the Impact of Digitization. The Global Information Technology Report, pp. 121–133, Available at:

https://www3.weforum.org/docs/GITR/2012/GITR_Chapter1.11_2012.pdf (Accessed: April 12, 2024).

Sadiku, M., Ashaolu, T., Ajayi-Majebi, A. and Musa, S., 2021. Smart cities, International Journal of Scientific Advances, 2(5), pp. 777–781.

Samarakkody, A.L., Kulatunga, U. and Bandara, H.M.N.D., 2019. What differentiates a smart city? A comparison with a basic city. In: Sandanayake, Y.G., Gunatilake, S. and Waidyasekara, A. (eds). Proceedings of the 8th World Construction Symposium, Colombo, Sri Lanka, 8-10 November 2019, pp. 618 -627. DOI: doi.org/10.31705/WCS.2019.61

Sánchez-Mena, A., Martí-Parreño, J. and Miquel-Romero, M.J. (2019) 'Higher education instructors' intention to use educational video games: An FSQCA approach', Educational Technology Research and Development, 67(6), pp. 1455–1478. doi:10.1007/s11423-019-09656-5.

Sancino, A., Hudson, L., 2020. Leadership in, of, and for smart cities – case studies from Europe, America, and Australia. Public Management Review 22, 701–725. https://doi.org/10.1080/14719037.2020.1718189

Sandri, S., Alshyab, N., & Sha'ban, M. (2022). The Effect of Digitalization on Unemployment Reduction. New Medit, 21(4). https://doi.org/10.30682/nm2204c

Sarmiento, J.R., 2017. The human component of smart cities (El componente humano de las smart cities). Rev. TELOS 105, 1–11.

Savastano, M., Suciu, M., Gorelova, I. and Stativă, G., 2023. How smart is mobility in smart cities? An analysis of citizens' value perceptions through ICT applications, Cities, 132, p. 104071.

Schaffers, H., Komninos, N., Pallot, M., Trousse, B., Nilsson, M., Oliveira, A., 2011. Smart cities and the future internet: Towards cooperation frameworks for open innovation, The Future Internet. Springer, Berlin Heidelberg.

Schumann, F. R. (2022). Using voyant tools for data mining social media comments about a destination: a Guam study, Journal of Hospitality & Tourism, 20(2), pp. 106-118.

Schwab, K. (2015). The fourth industrial revolution. Snapshot, 10, 1–9. https://doi.org/10.1038/nnano.2015.286.

Scott, G., 2022. Honeywell Joins Leading Health Providers To Improve Digitalization in Healthcare. Control Automation.

Sengan, S., Subramaniyaswamy, V., Nair, S.K., Indragandhi, V, Manikandan, J. and Ravi, L., 2020. Enhancing cyber–physical systems with hybrid smart city cyber security architecture for secure public data-smart network. Future Generation Computer Systems, 112, pp. 724–737. doi:10.1016/j.future.2020.06.028.

Shah, J., Kothari, J. and Doshi, N., 2019. *A survey of Smart City Infrastructure via case study on New York*. Procedia Computer Science, 160, pp. 702–705. doi:10.1016/j.procs.2019.11.024.

Sharifi, A., Khavarian-Garmsir, A.R. and Kummitha, R.K.R., 2021. Contributions of Smart City Solutions and Technologies to Resilience against the COVID-19 Pandemic: A Literature Review, Sustainability, 13(14), p.8018.

Sikora-Fernández, 2017. Smart city development factors (Factores de desarrollo de las ciudades inteligentes). Rev. Univ. De Geogr. 135–152.

Silveira, S., 2014. Smart city concepts in Curitiba – innovation for sustainable mobility and energy efficiency.

Sinclair, S. and Rockwell, G., 2016. Voyant Tools, Available at: http://voyant-tools.org/. (Accessed: March 18, 2024).

Smart City Concepts in Curitiba, 2022. Smart City Concepts in Curitiba – low-carbon transport and mobility in a digital society. URL https://smartcityconcepts.chalmers.se/about/ (accessed 11.9.22).

Smart City Solutions, 2021. 7 Smart City Solutions Implemented by New York During COVID-19. Smart Up Cities. URL https://www.smartupcities.com/7-smart-city-solutions-implemented-by-new-york-during-covid-19/ (accessed 6.7.23).

Smart London Board, 2014. Smart London Plan. Mayor of London, London, UK, pp. 1-52.

SmartCitiesWorld news team, 2019. Chicago launches first smart medical district. SmartCitiesWorld.

Srai, J., Lorentz, H., 2019. Developing design principles for the digitalisation of purchasing and supply management. J. Purch. Supply Manag. 25(1), pp. 78–98.

Stegerean, R., Trincă, V., Tămaş, A. and Nistor, R., 2022. *The Smart City Concept – Focusing on the Perception of Cluj-Napoca Residents*. Proceedings of the 16th International Management Conference, pp. 158-172.

Stoyanova, M. (2020). Good Practices and Recommendations for Success in Construction Digitalization. TEM Journal, 9(1), pp. 42–47. doi:10.18421/TEM91-07

Stübinger, J. and Schneider, L., 2020. Understanding Smart City—A Data-Driven Literature Review, Sustainability, 12(20), p.8460.

Tel Aviv City Hall, 2022. Tel Aviv Smart City. URL https://www.tel-aviv.gov.il/en/abouttheCity/Pages/SmartCity.aspx#:~:text=%D7%94%D7%A7%D7%9C%D7%93%20%D7%A9%D7%AA%D7%99%20%D7%90%D7%95%D7%AA%D7%99%D7%95%D7%AA%20%D7%9C%D7%A4%D7%97%D7%95%D7%AA.,%D7%9C%D7%94%D7%92%D7%99%D7%A2%20%D7%9C%D7%A8%D7%A9%D7%99%D7%9E%D7%AA%20%D7%94%D7%90%D7%A4%D7%A9%D7%A8%D7%95%D7%

99%D7%95%D7%AA%20%D7%95%D7%9C%D7%91%D7%97%D7%95%D7%A8%20%D7%9E%D7%9E%D7%A0%D7%94. (accessed 10.30.22).

The Constitution of Romania, Available at: https://www.presidency.ro/en/the-constitution-of-romania (Accessed: 11 February 2024).

The First Group, 2022. Dubai Launches Smart Healthcare. URL https://www.thefirstgroup.com/en/news/dubai-launches-smart-healthcare/

Thorseng, A., Grisot, M., 2017. Digitalization as institutional work: a case of designing a tool for changing diabetes care. Inform. Technol. People 30(1), pp. 227–243.

Toli, A.M. and Murtagh, N., 2020. The concept of sustainability in Smart City definitions, Frontiers in Built Environment, 6, pp. 1–10.

Tran, C. N., Tat, T. T., Tam, V. W., & Tran, D. H. (2022). Factors affecting intelligent transport systems towards a smart city: A critical review. International Journal of Construction Management, 23(12), pp. 1982–1998. doi:10.1080/15623599.2022.2029680

Trincă, V.-T., 2023a. Romanian Municipalities and the Smart city Framework. Review of International Comparative Management 24, 637–649. https://doi.org/10.24818/RMCI.2023.4.637

Trincă, V.-T., 2023b. The Key Components of a Smart City. Annales Universitatis Apulensis Series Oeconomica 25, 85–94. https://doi.org/10.29302/oeconomica.2023.25.1.8

Trincă, V., Nistor, R. and Stegerean, R., 2021. Digitalization in a post pandemic era. Managerial Challenges of the Contemporary Society, 14(1), pp.66-75.

Trittin-Ulbrich, H., Scherer, A. G., Munro, I., & Whelan, G. (2021). Exploring the dark and unexpected sides of digitalization: Toward a critical agenda. Organization, 28(1), pp. 8-25. https://doi.org/10.1177/1350508420968184

Tuppen, C., 2011. Smart City Bristol.

Turhan, C., Atalay, A.S. and Akkurt, G.G. (2019) 'Green smart cities: Living healthily with every breath', 2019 7th International Istanbul Smart Grids and Cities Congress and Fair (ICSG), pp. 114–118. doi:10.1109/sgcf.2019.8782302.

UIV Urban Innovation Vienna, 2022a. ICT in The Treatment Process and Patient Management. Stadt Wien. URL https://smartcity.wien.gv.at/en/e-health-2/ (accessed 11.25.22).

UIV Urban Innovation Vienna, 2022b. Smart City Wien. Stadt Wien. URL https://smartcity.wien.gv.at/en/ (accessed 11.25.22).

Ullo, S.L., Sinha, 2020. Advances in Smart Environment Monitoring Systems Using IoT and Sensors. Sensors 3113. https://doi.org/10.3390/app13020790

Umair, M., Cheema, M.A., Cheema, O., Li, H. and Lu, H., 2021. Impact of COVID-19 on IoT Adoption in Healthcare, Smart Homes, Smart Buildings, Smart Cities, Transportation and Industrial IoT. Sensors, 21(11), p.3838.

United Arab Emirates' Government, 2022. Smart Sustainable Cities. The United Arab Emirates' Government portal. URL https://u.ae/en/about-the-uae/digital-uae/smart-sustainable-cities#:~:text=Dubai's%20Smart%20City%20project%20adopts,services%2C%20urban%20planning%20and%20electricity. (accessed 10.20.22).

Universitatea Babeș-Bolyai, 2019. STUDIU Evaluarea de către cetățeni a serviciilor oferite de Primăria Municipiului Cluj-Napoca și alte instituții subordonate Consiliului Local UAT Cluj-Napoca. Programul Operațional Capacitate Administrativă. [Online]. Available at: http://www.poca.ro/wp-content/uploads/2019/10/Studiu-evaluarea-de-catre-cetateni-a-serviciilor-oferite-de-UAT-Cluj-Napoca.pdf [Accessed: 15 June 2023].

Valaskova, K., Throne, O., Kral, P., Michalkova, L., 2020. Deep learning-enabled smart process planning in cyber-physical system-based manufacturing. J. Self-Gov. Manag. Econ. 8, 121–127.

Valderrama, N., 2017. Smart Cities. Basic Concepts. Universidad de Manizales, Manizales.

Valenduc, G., Vendramin, P., 2017. Digitalisation, between disruption and evolution. Transf.: Eur. Rev. Labour Res. 23(2), pp. 121–134.

van Eck, N.J. and Waltman, L. (2010) 'Software survey: VOSviewer, a computer program for Bibliometric mapping', Scientometrics, 84(2), pp. 523–538. doi:10.1007/s11192-009-0146-3.

van Leeuwen, G., and Farooqui, S. (2008). ICT investment and productivity. Eurostat Final Report "Information Society: ICT impact assessment by linking data from different sources, pp. 163-189.

van Twist, A., Ruijer, E. and Meijer, A., 2023. Smart Cities & Citizen Discontent: A systematic review of the literature, Government Information Quarterly, 40(2), p. 101799.

Van Veldhoven, Z., and Vanthienen, J., 2021. Digital Transformation as an interaction-driven perspective between business, society, and Technology. Electronic Markets, 32(2), pp.629–644.

van Zoonen, L., 2016. Privacy concerns in smart cities. Elsevier 33, 472–480. http://dx.doi.org/10.1016/j.giq.2016.06.004

Vegacomp Consulting, 2022. *Moving to Building New Urban Spaces in Romania: Smart City in the Hidden City.* Smart City Scan in Romania, 6(1), pp. 2-69. [Online]. Available at: https://vegacomp.ro/wpr/wp-content/uploads/2022/08/radiografia-smartcity_2022_english_final.pdf [Accessed: 08 June 2023].

Verhoef, P. C., Broekhuizen, T., Bart, Y., Bhattacharya, A., Qi Dong, J., Fabian, N., & Haenlein, M. (2019). Digital transformation: A mul- tidisciplinary reflection and research agenda. Journal of Business Research., 122, 889–901. https://doi.org/10.1016/j.jbusres.2019. 09.022.

Vial, G. (2019). Understanding digital transformation: A review and a research agenda. Journal of Strategic Information Systems, 28(2), 1–27. https://doi.org/10.1016/j.jsis.2019.01.003.

Vial, G., 2019. Understanding digital transformation: A review and a research agenda. The Journal of Strategic Information Systems, 28(2), pp.118–144.

Vinod Kumar, T.M. and Dahiya, B. (2016) 'Smart economy in smart cities', Smart Economy in Smart Cities, pp. 3–76. doi:10.1007/978-981-10-1610-3_1.

Vogles, W., 2023. Is Australia the new epicenter for healthtech startups? ALL THINGS DISTRIBUTED. URL https://www.allthingsdistributed.com/2023/03/australia-the-new-epicenter-for-healthtech-startups.html (accessed 10.25.23).

von Humboldt, S., Mendoza-Ruvalcaba, N., Arias-Merino, E., Costa, A., Cabras, E. Low, G. and Leal, I., 2020. Smart technology and the meaning in life of older adults during the COVID-19 public health emergency period: A cross-cultural Qualitative Study, International Review of Psychiatry, 32(7-8), pp. 713–722.

Vrabie, C. and Dumitrașcu, E., 2018. *Smart Cities, from idea to implementation; or how technology can make the urban environment shine*. Bucharest: Universul Academic.

W. Abdalla, S. Renukappa, S. Suresh and R. Al-Janabi, "Challenges for Managing Smart Cities Initiatives: An Empirical Study," 2019 3rd International Conference on Smart Grid and Smart Cities (ICSGSC), Berkeley, CA, USA, 2019, pp. 10-17, doi: 10.1109/ICSGSC.2019.00-26.

Wilson, J.M. (2014) Henry Ford vs. assembly line balancing. International Journal of Production Research, 52 (3). pp. 757-765. ISSN 0020-7543

Win, L.L., Tonyali, S., 2021. Security and privacy challenges, solutions, and open issues in smart metering: A review, in: Proceedings of the 2021 6th International Conference on Computer Science and Engineering (UBMK). Ankara, Turkey, pp. 800–805.

Winkowska, J., Szpilko, D. and Pejić, S., 2019. Smart city concept in the light of the Literature Review, Engineering Management in Production and Services, 11(2), pp. 70–86.

Winkowska, J., Szpilko, D. and Pejić, S., 2019. *Smart city concept in the light of the Literature Review*. Engineering Management in Production and Services, 11(2), pp. 70–86.

Wirtz, B.W., Becker, M. and Schmidt, F.W., 2021. Smart City Services: An empirical analysis of citizen preferences, Public Organization Review, 22(4), pp. 1063–1080.

World Bank, 2022. Urban Development, Available at: https://www.worldbank.org/en/topic/urbandevelopment/overview (Accessed: April 8, 2023).

World Health Organization, 2022. Ambient (outdoor) Air Pollution, Available at: https://www.who.int/news-room/fact-sheets/detail/ambient-(outdoor)-air-quality-and-health (Accessed: April 15, 2023).

Wright, M., Chizari, H., Viana, T., 2022. A Systematic Review of Smart City Infrastructure Threat Modelling Methodologies: A Bayesian Focused Review. Sustainability 14, 10368. https://doi.org/10.3390/su141610368

Xu, C., and Jin, L. (2024). Effects of government digitalization on firm Investment Efficiency: Evidence from China. International Review of Economics & Finance, 92, pp. 819–834. doi:10.1016/j.iref.2024.02.066

Xu, Q., & Zhong, M. (2023). The impact of income inequity on energy consumption: The moderating role of Digitalization. Journal of Environmental Management, 325, Part A, p. 116464. doi:10.1016/j.jenvman.2022.116464

Yamen, A., Coskun, A., and Mersni, H. (2022). Digitalization and tax evasion: The moderation effect of corruption. Economic Research-Ekonomska Istraživanja, 36(2), pp. 1–24. doi:10.1080/1331677x.2022.2142634

Yang, C.-S. (2019). Maritime shipping digitalization: Blockchain-based technology applications, future improvements, and intention to use. Transportation Research Part E: Logistics and Transportation Review, 131, pp. 108–117. doi:10.1016/j.tre.2019.09.020

Yilmaz, V., & Telsac, C. (2021). Smart city components. Proc. Int. Conf. Social Sci., pp. 259-266.

Zona-Ortiz, A.T., Fajardo-Toro, C.H., Pirachicán, C.M.A., 2020. Propuesta de un marco general para el despliegue de ciudades inteligentes apoyado en el desarrollo de Iot en Colombia. Rev. Ibérica Sist. Tecnol. Inf. 28, 894–907.