A CONCEPTUAL MODEL FOR GROUNDING A SMART CITY DEVELOPMENT STRATEGY

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DOI: https://doi.org/10.30525/978-9934-26-601-0-15

Urban development in the context of active digital transformations is based on trends that determine the formation of a digital society. The perception of digitalisation as an objective process of our time requires a rethinking of long-term urban strategies, which is determined by approaches to the formation of a smart city. However, the concept of a smart city remains a dynamic concept and is in the process of transforming its perception. While at the first stages of the concept's emergence, city strategies envisaged technological and innovative development, at the stage of forming Industry 5.0, the city's functioning is increasingly based on a human-centred approach, with the quality of life of citizens as the dominant criterion. The modern concept of smart cities makes sense and has the right to be implemented only when any new high-tech solutions are aimed at creating a comfortable urban environment.

Research on the development of smart cities is based on a comprehensive consideration of the technological and innovative basis for urban development [1, 2], the specifics of implementing the smart city concept in Ukraine [3–5], and the development of their strategies [6, 7]. Recently, a significant emphasis in smart city research has been placed on the perception of digital changes and the involvement of residents in the development of strategies and their implementation [8, 9].

The focus of a smart city strategy on meeting the needs of residents and ensuring an increase in their quality of life is the main criterion for its development and subsequent implementation. Therefore, its development is based on the following principles:

1. human-centredness – focusing the introduction of high-tech services in the city life on improving the quality of life;
2. systemic approach – understanding of all spheres of life of the city, its residents, and local authorities as a single integrated system;
3. scientific validity – development of a smart city strategy based on a comprehensive analysis of urban situations and processes, modern scientific achievements, and scientific forecasts;
4. complexity – the need to take into account the interrelationships between individual components of the city and ensure its vital activity;

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5. purposefulness – directing all actions and practical measures to achieve a single goal – improving the quality of life – through the formulation of tasks to be solved;

6. efficiency – correlation of costs to expected results, taking into account the importance of reducing transaction costs, as well as the mandatory determination of public and social efficiency.

The proposed conceptual model for substantiating a smart city development strategy is based on 4 stages:

1. defining the goal and main objectives of the strategy: based on the problematic issues of urban development and promising areas identified at the previous stage, the goal of the smart city development strategy is formed. The goal is revealed in the tasks that specify the implementation by areas of the city's life and weaknesses that hinder such development. A clear formulation of the tasks can be facilitated by conducting a detailed SWOT analysis, PEST analysis or plus-minus analysis. Firstly, these types of analysis determine the basis for the introduction of innovative digital technologies based on opportunities and strengths, and secondly, they identify problematic issues that need to be addressed in advance (based on threats and weaknesses).

2. setting a development strategy: based on the results obtained in the preliminary justification and the first stage, the main directions of implementation of innovative digital technologies, types of "breakthrough" digital technologies that will be used to build the functioning of the city as a "smart" city, options for combining individual digital technologies and areas of their implementation into a single digital complex of city life are being worked out, the necessary resources and ways to attract them are being identified. The mandatory components of the strategy development are as follows:

– identification of indicators that characterise the achievement of the results of the strategy implementation, scientific justification of their values in the medium and long term;

– development of measures to improve the digital competencies and digital readiness for change of city residents, and identification of target indicators of the degree of readiness to accept innovative digital technologies.

3. outlining measures to implement the smart city development strategy, identifying target indicators for achieving objectives in specific areas and areas of activity, and formulating medium- and long-term implementation plans: when developing specific measures in a particular area, the use of design thinking approaches can yield significant results. In order to understand whether a new technology or idea is relevant and has consumer potential, design thinking involves the gradual implementation of several stages. The empathy stage, which involves the need to put yourself in the shoes of the person who will use the technology or service to understand how important, useful, and

user-friendly it is for a potential consumer. At the idea stage, based on the needs of city residents or a particular organisation or enterprise, options for its solution are formed. The next stage involves launching a prototype, which is a simplified version of the proposed technology (digital platform, digital product, etc.).

4. monitoring the implementation of specific measures: tracking changes in the implementation of the strategy, monitoring the achievement of target indicators, formulating proposals for adjusting measures or identifying previously unaccounted-for opportunities and threats. The monitoring stage should be active, since as a result of significant deviations from the target indicators in the implementation of the strategy, a decision is made to return to the first stage and adjust the smart city development strategy within the framework of the strategy being implemented.

Thus, a modern city that is actively developing and aims to improve the quality of life of its residents cannot but be "smart". In today's reality, the basic principle of a smart city is the perception of its technological capability and digital transformation by city residents. The change in approaches to strategy development is based on the understanding that the existence of a demand from the population for certain areas of digitalisation increases investment attractiveness and implementation efficiency. For potential investors, the presence of a potential user who has the appropriate level of digital competence and sees a particular digital product as improving the quality of services or interaction with local authorities can be a significant investment criterion. Thus, the integration of the results of the assessment of the perception of digital changes into the conceptual model of developing smart city strategies allows for the formation of personalised, targeted and demanded solutions that minimise investment risks and ensure sustainable effects in urban development.

References:

1. Shpak, O., Fedorka, P. and Pryhara, M. (2023) Rozumni mista ta Internet rechei: vplyv rozrobok u sferi IT na rozvytok mist i pokrashchennia yakosti zhyttia [Smart cities and the internet of things: the impact of its developments on the development of cities and improving the quality of life]. *Suchasnyi stan naukovykh doslidzhen ta tekhnolohii v promyslovosti*, vol. 3 (25), pp. 114–128.

2. Andriienko A. O., Mamatova T. V. (2021) Tekhnolohiia blokchein yak draiver rozvytku kontseptsii rozumnoho mista [Blockchain technology as a driver for the development of the smart city concept]. *International scientific journal "Grail of Science"*, vol. 2–3, pp. 101–106.

3. Munko A. Yu. (2022) Postup ukrainskykh mist shchodo realizatsii kontseptsii Smart – City v upravlinskykh protsesakh [Progress of Ukrainian Cities in Implementation of the Smart - City concept in administrative progress]. *Vcheni zapysky TNU imeni V. I. Vernadskoho*, vol. 6, pp. 161–166.

4. Nemyrovska, O. V., Chervona, S. P., Holovach, N. A. (2025). Otsinka ekonomichnoi efektyvnosti vprovadzhennia rozumnykh mist v Ukraini [Assessment of the economic efficiency of smart cities implementation in Ukraine]. *Zdobutky ekonomiki: perspektyvy ta innovatsii* [Modern economy: prospects and innovations], vol. 15. DOI: https://doi.org/10.5281/zenodo.14904886 (accessed 19 August 2025).

5. Panukhnyk O., Kurakh O. (2023) Mozhlyvosti implementatsii mizhnarodnykh peredovykh znan ta dosvidu u stalyi rozvytok "rozumnykh" mist i terytorialnykh hromad Ukrainy [Possibilities of implementing international advanced knowledge and experience in sustainable development of smart cities and territorial communities of Ukraine]. *Sotsialno-ekonomichni problemy i derzhava*, vol. 2 (29), pp. 111–118. Available at: http://sepd.tntu.edu.ua/images/stories/pdf/2023/23povthu.pdf (accessed 11 August 2025).

6. Kovalov, Yu. M. (2021). Analiz dosvidu orhanizatsii rozumnykh mist ta obgruntuvannia kontseptsii yikh rozvytku [Analysis of the experience of organising smart cities and substantiation of the concept of their development]. *Theory and practice of development*, vol. 22, pp. 41–54. DOI: https://doi.org/10.18372/2415-8151.22.15392 (accessed 11 August 2025).

7. Shpylova, V., Cherevko, O. (2022). Stratehichnyi rozvytok mist na osnovi prohresyvnoho svitovoho dosvidu [Strategic Development of Cities Based on Progressive World Experience]. *Modeling the Development of the Economic Systems*, vol. 1, pp. 129–137.

8. Romanovska, Y. (2025) Yevropeiski aktsenty rozvytku Rozumnykh mist: vyklyky ta dosiahnennia [European Focus on Smart City Development: Challenges and Achievements]. *European Journal of Economic and Financial Innovations*, vol. 1(15), pp. 103–113.

9. Pushkar T. A., Slavuta O. I. (2023) Spryiniattia protsesiv tsyfrovizatsii meshkantsami yak osnova vprovadzhennia prohram zbalansovanoho rozvytku mist [Perception of digitalisation processes by residents as the basis for implementing balanced urban development programmes]. *Acta Academiae Beregsasiensis. Economics.* 2023. № 4. pp. 107–117. Available at. https://aab-economics.kmf.uz.ua/aabe/article/view/131/95 (accessed 19 August 2025).