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QUALITY IN SMART CITY INFRASTRUCTURE SERVICE INDICATORS

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ABOUT ARTICLE

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Abstract: This article examines a number of relevant areas that help address smart city development. They are caused by the acceleration of digitization of all spheres of modern society, urbanization of regions. In this work, these aspects are highlighted as the main features in the construction of the research tree. The scientific novelty of the obtained result is in the systematization of research on the topic of smart cities and the identification of the main development trends in this field of knowledge.

INTRODUCTION

Currently, the dynamic development of technology has a significant impact on the formation of smart city concepts. The success of the city depends on its level of preparation and flexibility. The purpose of this article is to identify the latest trends that will have a direct impact on smart city concepts in 2023. To achieve this goal, secondary analysis, synthesis, generalization, induction, deduction, abstraction, comparison and logic methods were used. The main conclusion of the article is a set of preferred trends based on the frequency of their appearance in the articles of experts and consulting companies. Trends such as centralized data management, citizen-centricity, and cybersecurity transparency are becoming more widespread.

Several authors and experts predict that by 2050, more than 75 percent of the world's population will live in cities. Cities cover only 3% of the Earth's surface, but they are the driving force of development, quality of life and sustainability. It is important to increase the robustness of urban concepts by stabilizing, creating and sustaining smart cities.

In our country and in foreign literature, there are many articles devoted to QoS indicators in the concept of Smart City. In particular, G.I.Kurcheeva and G.A.Klyuchkov's works entitled "Development of the "Smart City" process model" ("Razrabotka protsessnoy modeli "umnyy gorod") gave a comprehensive approach to the concept of a Smart City. The purpose of this work is to increase the quality indicators of the population's lifestyle, to be able to quickly find solutions to the problems in the city, to use the city's resources rationally, and to ensure the safety of the population and information.

In the article "Network architecture and QoS issues in the internet of things for a smart city" by Jiong Jin, Tony T. Luo and M. Palaniswami, various smart presented four different IoT network architectures covering urban applications and defined their corresponding network Quality of Service (QoS) requirements. In the field of smart city development, this paper focuses on the communication and networking aspect of IoT. This new network paradigm involves people in the cycle of information acquisition-transmission-interpretation-action and therefore enables them to actively contribute to the smart city of the future.

"Evaluation of the QoS policy model of an ordinary 5G smart city cluster with predominant URLLC and eMBB traffic" by V. Kovtun, K. Grochia, M. Al-Maitah traffic"), the problem of effective QoS policy formulation for a facility dominated by Ultra-Reliable Low Latency Link (URLLC) and Enhanced Mobile Broadband (eMBB) traffic types in a 5G smart city cluster is presented. Basically, this research work considers a Quality of Service (QoS) policy with constraints for contextual URLLC and eMBB classes of incoming requests. Considering that the URLLC request class has a higher priority than the eMBB request class, QoS policy balancing is compared to determine the QoS policy. During the comparative test, the recommended indicators have achieved positive results.

Digitization of the urban environment within the implementation of the "Smart City" concept of D.V. Kovalyov: territorial analysis and implementation mechanisms ("Tsifrovizatiya gorodskoy sredi v ramkax realizatsii kontseptsii "umnyy gorod": territorialnyi analiz i mezhnyy vnedreniya") in the scientific work on the concept of "Smart City" in Russia the main problems and directions for the development of the "Smart City" concept are presented. The territory of the Sverdlovsk Region was studied and recommendations for improvement were given.

The practical significance of the research is that it is a project that can be implemented by local authorities together with the municipalities of the Sverdlovsk region. When studying the scientific work of O.K. Togyanova on the topic "Models and methods of developing dynamic planning systems in the development of a smart city" ("Modeli i metody razrabotki sistem dinamicheskogo planirovaniya razvitiya Smart city"), the development of a modified hierarchical analysis method

allows the formation of consistent matrices of paired comparisons. A modified method of analyzing hierarchies is proposed for the first time in this scientific work.

About the dissertation work of S.A. Kuznetsova on the topic "Management and evaluation model of smart cities" A five-level model of managing the efficiency of "smart cities" was presented based on the information collected during interviews with representatives of smart cities, as well as a survey conducted among representatives of IT companies and universities. The main value of the presented model lies in the comparison of smart city goals with specific qualitative and quantitative key indicators. The first objective is implemented at the country level. Every government strives for sustainable development, protecting the rights of citizens and being political. The second level of research explains the smart city goals, as smart cities represent a part. Different smart cities can be very similar, because these cities belong to one general category, some components may differ and depend on their economic, political and social characteristics. The third objective is closely related to the main functions of distributed smart cities. Nowadays, almost all cities have the same structure. It usually includes an economic development and finance committee. Education Committee, Industry Committee, Social Policy Committee, Construction Committee, Transport and Logistics Committee, Culture Committee, Public Safety Committee and others are listed. The objectives of a smart city and the areas of each committee are different and depend on the tasks and areas that the committee deals with. The last two levels provide a performance measurement system, and this evaluation criterion is presented in this thesis. According to the conclusions, the goals for a certain period of time are set for the effective management of the Smart City. By assigning goals to committees, the management process becomes easier.

In the article by N.A. Kolodii, V.S. Ivanova, N.A. Goncharova on the topic "Smart City: The Concept and its Adaptation to the Russian Context" ("Smart City: The Concept and its Adaptation to the Russian Context") from "Smart cities" to "people-oriented smart cities" General and specific (for Russia) factors that determined the transition to " are highlighted. People-centered smart cities are cities where governments engage citizens by supporting the co-design of technical and social innovation processes through mutual trust and collaborative relationships.

E. Ismagilova, L. Hughes, N. Rana, Y. Dwivedi "Security, Privacy and Risks Within Smart Cities: Literature Review and Development of a Smart City Interaction Framework" ("Security, Privacy and Risks Within The article "Smart Cities: Literature Review and Development of a Smart City Interaction Framework") mentions a number of key topics in smart cities research. These are:

- privacy and security of mobile devices and services;
- frameworks, algorithms and protocols to improve smart city infrastructure, energy systems, healthcare, security and privacy, operational threats to smart cities, use and adoption of smart services

by citizens, use of blockchain and use of social media. This comprehensive review has provided a useful perspective on many key issues and suggested key directions for future research.

In the article "Networking architectures and protocols for smart city systems" by I.Jawhar, N.Mohamed, J.AI-Jaroodi, the network characteristics and requirements of smart city applications are defined and various components are defined network protocols that can be used to support the various data traffic flows required between In addition, network architectures of selected smart city systems are presented, including smart grid, smart home energy management, smart water, commercial aircraft security, and pipeline monitoring and control systems.

A novel framework and enhanced QoS Big Data Protocol for Smart City Applications by Sh.Rani, S.H.Chauhdary on the topic "A Novel Framework and Enhanced QoS Big Data Protocol for Smart City Applications" is a new approach to improve energy saving and IoT system is to reduce the delay in collecting large data in the small sensor nodes used. In order to realize a smart city scenario in terms of big data in IoT, an efficient (quality of service optimized) WSN is required when the node communication is energy efficient. Therefore, in this scientific work, a new QoS-IoT protocol is proposed on top of the architecture approved by traditional protocols.

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