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SMART CITIES: CHARACTERISTICS AND WORLD TRENDS

УМНЫЕ ГОРОДА: ХАРАКТЕРИСТИКА И МИРОВЫЕ ТЕНДЕНЦИИ

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Abstract. The article analyzes global trends in urbanization. The content of the concept of Smart City is determined, its main features and constituent elements are determined. The results of the ranking of smart cities in the world are presented. The main directions for the implementation of the typical digital platform project Smart City (Region) in Belarus are considered.
Аннотация. В статье проанализированы мировые тенденции урбанизации. Определено содержание понятия «Умный город», определены его основные черты и составляющие элементы. Представлены результаты рейтинга умных городов мира. Рассмотрены основные направления реализации проекта типовой цифровой платформы «Умный город (регион)» в Беларуси.

The current global trend is an increase of the number of cities and urban population (table). In 2022, the global urbanization rate was 57 %, including 83 % in North America, 81% in Latin America and the Caribbean, 75 % in Europe, 67 % in Oceania, 52 % in Asia, Africa – 44 % [1].

Table 1 – Forecast of the urban population by region

Region	Number, million people	
	2030	2050
Asia	2808.26	3479.06
Africa	824.01	1488.92
Europe	572.56	598.86
Latin America and the Caribbean	600.48	685.07
North America	334.78	386.69
Oceania	32.83	41.19

Source: [2].

Population growth, increased intensity of traffic flows, increased greenhouse gas emissions require new approaches to the management of regions and territories. Ensuring the coordination of logistics flows, solving environmental problems and social issues at the level of the city system is largely due to the use of modern management technologies based on the introduction of the smart city concept. Its relevance is due to the need to improve the comfort and standard of living of the population, optimize logistics flows, increase the efficiency of resource use and reduce the harmful impact on the environment.

A smart city is a city of a new generation, which provides for the effective management of the city system and the provision of a high living standard for the population through the use of innovative technologies.

The key elements of a smart city are the following: urban infrastructure; urban management (smart government); smart buildings; smart urban transport; smart housing and communal services; public safety systems; ecology and sustainable development; smart healthcare.

The development of smart transport is the use of its ecological types, the use of intelligent traffic management systems, the creation of a single information space for the population, the introduction of smart parking.

The volume of the global market for intelligent transport systems in 2020 was estimated at 25378.2 million US dollars, while until 2028 the annual growth rate will be approximately 7 %.

The management of urban infrastructure within the framework of the functioning of a smart city involves the creation of modern infrastructure facilities of various types and purposes: roads, bridges, shopping centers, social facilities, recreation areas. As part of solving logistics problems, the planning of traffic and pedestrian flows within individual streets and sections of roads, the regulation of traffic lights in order to reduce loss of time during movement and reduce emissions of harmful substances into the atmosphere, and intelligent parking management are of particular importance. The use of intelligent systems is of the utmost importance.

Depending on the level of control or automation, these types of infrastructures are divided into the following types:

– Semi-intelligent infrastructure – this infrastructure collects and records data about its own usage, its structural behavior and environmental conditions, but does not have the ability to make decisions based on the information received. Examples of this infrastructure would be maps that capture city pollution or vehicle traffic.

– Intelligent infrastructures are systems that collect data to process and present information in a way that helps a person make decisions. One example of such a framework would be a traffic system that detects heavy traffic and informs drivers so they can make better decisions while driving.

– Smart infrastructure. This infrastructure collects data, processes information and takes appropriate actions completely autonomously (without human intervention) and dynamically, adapting to changing conditions. This classification usually includes smart grids, smart buildings, smart public infrastructure or smart beaches [3].

Urban management is associated with the planning of urban areas, efficient allocation of resources, organization of urban traffic, ensuring the effective functioning of the city's life systems, and the availability of social services.

Smart buildings are characterized by integrated automation, remote control, and the use of smart appliances.

The development of smart transport is the use of its ecological types, the use of intelligent traffic management systems, the creation of a single information space for the population, the introduction of smart parking.

The activities of housing and communal services in the smart city system are based on the use of online accounting systems for the consumption of water, gas, energy, as well as domestic waste and sewage; detection of losses and leaks, repair management; emergency management, etc.

Public security systems of a smart city involve the introduction and use of automated systems that provide information and technical support to the law enforcement service, the development of video surveillance systems and intelligent control systems, road safety, the introduction of systems for informing citizens about emergencies, etc.

The creation of a single digital space in the field of healthcare allows increasing the speed of providing medical services, increasing the level of diagnostics, reducing the number of medical errors and increasing the effectiveness of treatment, and improving the quality of patient care using modern equipment.

Currently, Smart City projects have been implemented in one way or another in 2,500 cities around the world.

The Institute for Management Development (IMD) and the Singapore University of Technology and Design (SUTD) presented the following ranking of the TOP 10 smart cities in 2021: Singapore, Zurich, Oslo, Taipei, Lausanne, Helsinki, Copenhagen, Geneva, Auckland, Bilbao.

At the same time it should be noted that there are leading cities in each region: New York (12th place) leads in North America, Abu Dhabi (28th place) – in the Middle East, Moscow (54th place) – in Eastern Europe, Buenos Aires (98th place) – in Latin America, Cairo (104th place) – in Africa.

The ranking takes into account economic and technological indicators: the level of health and safety, mobility, opportunities, development and growth prospects [4].

As for Belarus, in accordance with the approved State Program «Digital Development of Belarus» for 2021–2025, the project «Smart Cities of Belarus» is being implemented. It provides comprehensive regional development through the consistent and large-scale implementation and integration of digital solutions based on information and communication technologies. For the development of smart city technologies in all regions of the country, it is planned to create a regional state standard digital platform «Smart City (Region)», a national geoportal, development a regional information and communication infrastructure, create and development standard services in various areas of urban life.

The project «Smart Cities of Belarus» should ensure the construction of a modern regional management system as a basis for carrying out activities for a comprehensive digital transformation of the economy and social sphere of Belarus [5].

At present, along with the implementation of the republican digitalization projects, digital technologies are being introduced in certain regions of the country. Cities with a population of more than 80 thousand people, namely: Orsha, Baranovichi, Pinsk, Novopolotsk, Polotsk, Mozyr, Lida, Borisov, Soligorsk, Molodechno, Bobruisk, for which pilot digital transformation projects are being developed [5].

The implementation of infrastructure reforms is carried out at the level of the Ministry of Communications and Informatization, the Ministry of Transport and Communications, the Ministry of Internal Affairs, the Ministry of Natural Resources and Environmental Protection, the State Property Committee.

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