



THE ROLE OF ARTIFICIAL INTELLIGENCE AND INFORMATION SYSTEMS IN THE SOCIO-ECONOMIC DEVELOPMENT OF KARSHI CITY

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Abstract: This article analyzes the role of artificial intelligence and modern information systems in the socio economic development of Karshi city. The importance of artificial intelligence technologies in solving problems related to the urban transport system, territorial expansion processes, and pendulum migration flows is scientifically substantiated. The research results show that the introduction of digital technologies contributes to effective management of urban infrastructure and improvement of the population's standard of living.

Keywords: artificial intelligence, information systems, digital economy, Karshi city, transport system, urbanization, pendulum migration, smart city.

INTRODUCTION

In the modern era of globalization, digital technologies and artificial intelligence are widely used in various sectors of the economy. Modern information systems play an important role in improving efficiency in production, transportation, logistics, public administration, and service sectors. For this reason, many countries are implementing the 'Smart City' concept in urban governance. This concept is based on artificial intelligence, statistical data, internet technologies, and digital management systems. Sustainable development of cities requires the use of modern management technologies. Due to the rapid acceleration of urbanization processes, the demand for urban infrastructure, transport systems, and social services is increasing. Therefore, the use of digital technologies and artificial intelligence systems has become crucial for effective urban management. Artificial intelligence makes it possible to analyze large volumes of data, forecast traffic flows, and efficiently plan urban development processes.

In the Republic of Uzbekistan, the development of the digital economy is considered one of the priority directions of state policy. In particular, the 'Digital Uzbekistan –



2030' strategy defines the tasks of introducing modern information and communication technologies into public administration, the economy, and social sectors.

Karshi city, the administrative center of Kashkadarya region, is one of the cities where territorial development and urbanization processes are progressing rapidly. In recent years, population growth, the construction of new residential areas, and the expansion of economic activity have been observed in the city. These processes create a number of problems related to the urban transport system, communal infrastructure, and territorial planning.

In particular, traffic congestion in the city transport system, urban planning problems caused by territorial expansion, and pendulum migration flows from surrounding districts complicate urban management. The use of artificial intelligence and modern information systems plays an important role in effectively addressing these problems.

LITERATURE REVIEW AND METHODS

The impact of artificial intelligence and information technologies on economic and territorial development has been studied by many local and foreign scholars in recent years. Studies in economic geography show that the sustainable development of modern cities largely depends on digital infrastructure, transport systems, and the effective management of urbanization processes.

Among Uzbek scholars, A.S. Soliyev emphasizes that the transport geographical position, economic infrastructure, and demographic processes play an important role in urban development [1]. According to him, the transport system and territorial planning are key factors in modern urban development.

E.A. Axmedov notes in his research on urban geography that urbanization processes increase the load on urban infrastructure and transport systems [2]. This situation requires the use of modern information technologies in urban management.

Local researcher Q.X. Abdurahmonov emphasizes that the development of the digital economy improves the efficiency of production and service sectors [3]. The use of artificial intelligence technologies expands the possibilities for analyzing and forecasting economic processes.

Foreign scholar M. Castells in his work 'The Rise of the Network Society' states that digital technologies have become one of the main factors of the global economy [4]. Information technologies enable effective management of urban infrastructure and optimization of economic processes.

M. Batty in his research 'Smart Cities and Big Data' highlights that the smart city concept is an important component of modern urbanization processes [5]. According



to him, big data and artificial intelligence technologies make it possible to effectively manage transport systems, urban development, and migration processes.

In this study, methods such as analysis of scientific literature, examination of statistical data, comparison, and generalization were used. Data related to the socio economic development indicators of Karshi city and Kashkadarya region, as well as information about the transport system, were analyzed to evaluate the potential of artificial intelligence technologies in urban management.

DISCUSSION

Karshi city is a major economic and administrative center of the Kashkadarya region and has experienced rapid urbanization in recent years. Population growth, the formation of new residential areas, and the expansion of economic activity increase the pressure on urban infrastructure. As a result, several problems related to transport systems, territorial planning, and migration processes arise.

One of the main problems observed in the urban transport system is the increasing level of traffic congestion. Especially in central streets and major intersections, the growth of traffic flows reduces the efficiency of road movement. This situation can negatively affect economic activity as well. Artificial intelligence based smart transport systems allow real time monitoring of traffic flows, automatic control of traffic lights, and optimization of traffic movement.

The territorial expansion of the city also creates urban planning problems. The formation of new residential districts and industrial areas requires the development of transport infrastructure, engineering communications, and social services. Artificial intelligence technologies help forecast territorial development, optimally locate infrastructure facilities, and effectively plan transport systems.

Another important process for Karshi city is pendulum migration. As the regional center, many residents from surrounding districts commute daily to the city for work, education, and services. This process increases the load on the transport system. Artificial intelligence technologies allow the analysis of these migration flows and the optimization of public transport routes and schedules.

In addition, the use of statistical data and digital analytical tools helps determine the load level on urban infrastructure and transport systems. Based on these data, it becomes possible to develop comprehensive urban development strategies, modernize the transport system, and effectively manage urbanization processes.

RESULTS

The research results show that the implementation of artificial intelligence and modern information systems plays an important role in the socio-economic development of



Karshi city. Digital technologies create opportunities for efficient management of urban infrastructure, optimization of transport systems, and regulation of urbanization processes.

First, the use of artificial intelligence technologies in the management of urban transport systems enables effective control of traffic flows. Smart transport systems allow real-time monitoring of traffic movement, analysis of transport flows, and automatic control of traffic lights. International experience shows that traffic congestion may decrease by 15–25% in cities where smart transport systems are implemented.

Second, artificial intelligence technologies serve as an important tool for forecasting territorial development of cities. Based on statistical data, demographic changes, population density, transport flows, and economic activity can be analyzed. These data allow the planning of new residential areas, development of transport infrastructure, and optimization of territorial planning.

Third, the analysis of pendulum migration processes creates opportunities for improving the efficiency of the urban transport system. Artificial intelligence technologies make it possible to analyze migration flows, optimize public transport routes, and organize transport schedules more effectively.

Fourth, modern information systems enable integrated management of urban infrastructure. Integrating data related to transport, utilities, energy, and social services into a single information system increases the efficiency of urban management and contributes to economic development.

CONCLUSION

The research shows that artificial intelligence and digital technologies play an increasingly important role in ensuring sustainable urban development. These technologies enable efficient management of infrastructure, optimization of transport systems, and effective planning of urban processes.

As a rapidly developing regional center, Karshi city faces challenges related to traffic congestion, urban expansion, and pendulum migration. The implementation of artificial intelligence technologies can significantly improve the efficiency of the transport system and urban infrastructure management.

In general, the integration of artificial intelligence and modern information systems into the management of transport, urban development, and migration processes in Karshi city will increase infrastructure efficiency, accelerate economic development, and improve the quality of life of the population.



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