FUTURE PROSPECTS OF UNMANNED AIRCRAFT

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Abstract. Unmanned aerial vehicles have recently gained significant importance in transportation, military, and commercial sectors. Rapid technological advancement, along with improved artificial intelligence and sensor systems, enhances unmanned aerial vehicles efficiency and broadens their applications. This article explores the future prospects of Unmanned aerial vehicles's, their use in transport, logistics, agriculture, and security, as well as trends in scientific and technological development.

Keywords: unmanned aerial vehicles, drones, automation, artificial intelligence, transport, logistics, future technologies.

Аннотация. Беспилотные летательные аппараты в последние годы занимают важное место в транспортной, военной и коммерческой сферах. Развитие технологий, совершенствование систем искусственного интеллекта и сенсорных устройств повышает эффективность Беспилотные летательные аппараты и расширяет возможности их применения. В статье рассматриваются перспективы беспилотных аппаратов, их использование в транспорте, логистике, сельском хозяйстве и безопасности, а также тенденции научно-технического развития.

Ключевые слова: беспилотные летательные аппараты, дроны, автоматизация, искусственный интеллект, транспорт, логистика, технологии будущего.

Annotatsiya. Uchuvchisiz uchish apparatlari so‘nggi yillarda transport, harbiy va tijorat sohalarida muhim o‘rin egallamoqda. Texnologiyaning tez rivojlanishi, sun’iy intellekt va sensor tizimlarining takomillashuvi uchuvchisiz uchish apparatlarining samaradorligini oshiradi va ularni keng qo‘llash imkoniyatini yaratadi. Ushbu maqolada uchuvchisiz apparatlarning kelajakdagi istiqbollari, ularning transport, logistika, qishloq xo‘jaligi va xavfsizlik sohalarida qo‘llanilishi, shuningdek, ilmiy-texnologik rivojlanish tendensiyalari tahlil qilinadi.

Kalit so‘zlar: uchuvchisiz uchish apparatlari, dronlar, avtomatlashtirish, sun’iy intellekt, transport, logistika, kelajak texnologiyalari.

INTRODUCTION

In recent years, unmanned aerial vehicles, or drones, have been increasingly used in the transport, military and commercial sectors. This technology allows reducing human labor, saving costs and speeding up processes. The effectiveness of unmanned aerial vehicles is associated with artificial intelligence, sensor systems and high-precision control mechanisms, which further expands their future development prospects. At the same time, drones play an important role in such areas as agriculture, logistics, environmental monitoring, and rapid delivery in emergency situations.

The development of unmanned aerial vehicle technologies not only increases technical capabilities, but also creates new social and economic opportunities. For example, with the help of automated control systems, safety, energy efficiency and the demand for human resources are significantly reduced. At the same time, the processes of data collection, monitoring and analysis using drones become faster and more efficient [1].

In terms of future prospects, drones will be integrated with artificial intelligence and will have the ability to make independent decisions. This will allow them to be widely used in the transport system, urban infrastructure and security

monitoring. Therefore, research and development of drone technologies is not only of scientific, but also economic and social importance today.

This article analyzes the future development trends, application areas and technological capabilities of drones, and considers their impact on human life and the economy.

LITERATURE REVIEW AND RESEARCH METHODOLOGY

Scientific research on drones has increased dramatically in recent decades. Scientific articles and technological reviews provide extensive information on the application of drones in transport, logistics, agriculture, security and environmental monitoring (Anderson, 2020; Zhang & Wang, 2021). At the same time, it is argued that artificial intelligence, sensor systems and automated control mechanisms can increase the efficiency of drones [2].

Some sources highlight the economic benefits of drones, such as energy efficiency, safety and reduced demand for human resources (Kumar et al., 2019). At the same time, scientific analyses also highlight the social, legal and ethical issues that arise with the development of technology. Literature analysis helps to deeply understand not only the technical capabilities of drones, but also their impact on society and serves as a basis for determining the direction of research [3].

This study uses a combination of qualitative and quantitative analysis methods. In the first stage, scientific articles, technical reports and patents are analyzed to identify development trends in drone technology. In the next stage, future prospects are identified through interviews with industry experts and expert assessment. The quantitative analysis analyzes statistical data, global market growth for drones, and technological parameters. This methodology allows for an integrated assessment of the technological, economic, and social aspects of drones. The results serve to identify future research directions and innovation opportunities.

ANALYSIS AND RESULTS

The scientific literature and applied research in the field of drones extensively cover their technological, economic, and social aspects. The results of the analysis show that drones significantly reduce delivery times in transport and logistics systems, while reducing the need for human resources. For example, drone systems used by large transport companies can speed up product delivery by 30–50%. At the same time, drones in the agricultural sector optimize the processes of monitoring crops, irrigation, and pesticide application, which helps to increase productivity [4].

From a technological perspective, artificial intelligence and advanced sensor systems are increasing the autonomous decision-making capabilities of drones. For example, the ability to change direction, avoid obstacles, and automatically control safety parameters significantly increases the safety of drones. At the same time, energy efficiency issues are also relevant, and optimizing battery efficiency and recharge time is one of the main areas of research [5].

Economically and socially, the development of drone technologies will create new jobs along with reducing the demand for traditional labor. At the same time, drones in the fields of security and environmental monitoring increase responsibility, allowing for fast and accurate data collection. The results of the study show that the future development of unmanned aerial vehicles is not limited to technological capabilities; it also increases social, economic and environmental efficiency.

Overall, the analysis shows that the future prospects of unmanned aerial vehicles are very broad and cover a wide range of areas. The use of drones in areas such as transport, logistics, agriculture, security and environmental monitoring will increase efficiency and reduce costs. At the same time, artificial intelligence, automated control systems and energy-saving technologies will make drones more robust and reliable. The results of the study open up opportunities for further expansion of unmanned aerial vehicle technologies in the future, the creation of new innovative products and the generation of socio-economic benefits.

The resulting analysis shows that unmanned aerial vehicles (UAVs) open up great prospects not only in terms of technological development, but also in terms of economic efficiency and social benefits. Therefore, the development of research and innovative developments in the field of unmanned aerial vehicles will serve to further expand the use of modern technologies in the future.

CONCLUSION

Unmanned aerial vehicle technology is now widely used not only in the transport and military sectors, but also in commerce, agriculture, environmental monitoring and emergency situations. The results of the study show that the integration of automated control systems and artificial intelligence of unmanned aerial vehicles increases the ability of drones to operate independently and significantly reduces the demand for human resources. At the same time, energy saving and safety capabilities increase the efficiency of unmanned aerial vehicles, expanding their potential for use in various industries.

In the transport and logistics sectors, drones accelerate delivery processes and reduce costs, and in agriculture they create the opportunity to monitor and optimize yields. The study shows that in the future, unmanned aerial vehicle technologies will serve not only to increase technical and economic efficiency, but also to provide social and environmental benefits. Therefore, the development of unmanned aerial vehicles should be considered a priority area for scientific, technological and innovative research.

As a result, the future prospects of drones are wide and cover various fields. The conclusion from the study is that drone technology is a simple, safe and effective tool for human life, and their scientific research and innovative development will expand further in the future.

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