ARTIFICIAL INTELLIGENCE AND ITS NECESSITY IN MODERN MEDICAL MANAGEMENT

M.J. Iqboljonova[1], A.A. Xajimuratov[2]
FJSTI TPI, 2nd-year student[1]
Associate Professor, Department of Social Sciences, FJSTI, Doctor of Economics[2]
https://doi.org/10.5281/zenodo.18846556

Abstract. *This article examines the essence of artificial intelligence (AI), its entry into the healthcare sector via digital technologies, its significance in modern medicine, and the necessity of its application today.*

Keywords: *modern medicine, artificial intelligence, digital technologies, healthcare, algorithms, automation.*

Introduction

AI technologies are revolutionizing the medical field. Modern healthcare requires processing large volumes of data, accurate diagnostics, early disease detection, and optimized management processes. Integrating AI into medical management is therefore urgent and strategically important. Currently, AI automates diagnostic processes, individualizes treatment plans, reduces human errors, and optimizes the use of medical resources. AI algorithms also play a crucial role in analyzing medical images, deepening genetic research, patient monitoring, and forecasting epidemics. In the ongoing digital transformation, AI provides innovative approaches, precision, and rapid decision-making capabilities in healthcare management, making it an essential direction in modern medicine.

Objective: The aim of the research is to conduct a thorough scientific analysis of the role, place, and effectiveness of artificial intelligence (AI) technologies in managing modern healthcare systems, and to explore the necessity of integrating these technologies into medical practice and administration.

The study focuses on investigating the role, capabilities, and efficiency of AI technologies in contemporary healthcare management, as well as developing scientific and practical foundations for their implementation in the health sector. Through this research, the following approaches are undertaken: a scientific analysis of the core principles of AI, its operational mechanisms, and areas of application in medicine; examination of AI's potential in early disease diagnosis, automation of treatment processes, health monitoring, and epidemic forecasting; justification of the importance of big data, machine learning, and neural networks in managing and analyzing medical information; and identification of opportunities to optimize healthcare institution management, reduce human error, and accelerate decision-making through AI tools.

Additionally, the study aims to develop a conceptual model that ensures the sustainable development of AI technologies in the digital transformation processes within the medical field. Overall, the research seeks to determine ways to enhance healthcare service quality, preserve human life, and efficiently manage medical processes through the application of AI in healthcare system management based on digital transformation.

Materials and Methods: The main material of the study consisted of artificial intelligence (AI) systems applied in the medical field, software platforms, digital databases, algorithms for

analyzing medical imaging, healthcare management programs, and relevant scientific literature. Additionally, opinions and experiences regarding the use of AI technologies in global and Uzbek medical practice were examined. The article employed the following scientific-methodological approaches and methods:

Theoretical analysis – studying the scientific foundations, operating principles, and areas of application of artificial intelligence in medicine.

Comparative method – comparing the effectiveness of traditional management systems with AI-based management models.

Systemic approach – analyzing the interconnection and integration of AI across all levels of healthcare management.

Empirical (practical) methods – studying the practical outcomes of existing AI platforms, such as diagnostic software and data analysis systems.

Statistical analysis – analyzing and summarizing performance indicators related to the implementation of AI in medicine. Using these methods, the study focused on a detailed examination of the practical capabilities of AI technologies in medicine, their impact on management efficiency, and their role in reducing human error.

Research Results: Artificial intelligence (AI), as the term implies, refers to technology that simulates human thinking, learning, and decision-making processes through computers and software. AI algorithms rely on large datasets, have the capacity to learn independently (machine learning), and often provide results faster and more accurately than humans. “Artificial intelligence is a distinct branch of computer science, which deals with creating computer systems capable of performing tasks typically associated with human cognition: understanding language, learning, reasoning, problem-solving, translation, and similar abilities. AI allows computers to learn from experience, adapt to given parameters, and perform tasks that were previously possible only for humans” [1]. Thus, at present, AI consists of algorithms and software systems designed to perform a variety of functions, successfully executing tasks that humans are capable of.

In modern medicine, AI development and data analysis enable highly effective diagnosis and treatment. AI algorithms assist in processing clinical information, making diagnoses, and planning treatment. Today, digital technologies and innovations such as AI have become an integral part of human life. The use of AI and digital technologies across various fields plays a critical role in fostering innovation, simplifying human life, and improving efficiency. One of the most relevant contemporary directions in medicine is the development and application of intelligent systems for disease diagnosis and prognosis. These systems are based on various mathematical models and algorithms. AI systems grounded in mathematical apparatuses are particularly effective in solving problems related to medical diagnosis and prediction [2].

Consequently, AI performs routine tasks with high accuracy. For example, it can detect foreign objects or pathological changes on X-rays and identify cancer cells in cytological samples. AI has already demonstrated excellent results in analyzing various medical data — for instance, accuracy in detecting pathologies through ultrasound and MRI exceeds 90%. The research results indicate that integrating AI technologies into healthcare management significantly improves the quality, speed, and accuracy of health services.

Based on the reviewed literature and practical experiences, the following findings were obtained: AI-based diagnostic systems enable early disease detection and reduce human errors in diagnosis by 30–40%. Algorithms for analyzing medical data allow rapid processing of large volumes of clinical information (Big Data) and the formulation of individualized treatment

strategies. AI-based management systems have shown high effectiveness in optimizing the use of resources in medical institutions, distributing medications, and controlling patient flow.

Telemedicine and digital consultation platforms have expanded opportunities for remote patient communication, real-time health monitoring, and timely decision-making. The use of AI tools by medical personnel has improved work efficiency, saved time, and reduced professional errors. The findings confirm the strategic necessity of AI utilization in medicine, demonstrating that it is elevating healthcare management to an intelligent level.

Discussion: According to the scientific literature [3], today AI is one of the most "trending" topics. The 21st century is the age of technology, and technology represents the future. Consequently, revolutionary changes bring up several questions:

- **Will AI take jobs away from humans?** This question is very relevant. AI itself does not replace human jobs; however, people who can effectively use AI may gain a competitive advantage. Therefore, there is no need to fear AI itself, but rather to study and understand it thoroughly.
- **Which fields are most impacted by AI?** AI has rapidly entered the media sector, particularly in image processing, editing, and similar tasks. Abroad, AI avatars have been developed to replace television presenters, conducting programs in some cases.
- **What are the negative aspects of AI?** Like any tool, AI can have negative consequences depending on its use. Just as a knife can be used in the kitchen or as a weapon, AI can be beneficial or harmful depending on the purpose and the user. For example, in late 2022 and early 2023, numerous fake images circulated, generating false news. On the positive side, this has highlighted the need for fact-checking and verification.

Conclusion and Recommendations: Analysis of the research results indicates that, although AI use in healthcare is still relatively new, studies on its application across various medical sub-disciplines and related fields are ongoing. Implementing AI technologies in healthcare is one of the most important directions for modernizing the sector. With AI, healthcare processes — including diagnosis, treatment, prevention, surgery, medical data management, and healthcare organization — can be conducted accurately, quickly, and efficiently. AI enables medical personnel to save human resources, reduce errors, continuously monitor patient health, and optimize decision-making in healthcare management. Furthermore, AI serves as an important tool for automating medical institutions' operations, ensuring fair distribution of medications and healthcare services, and reducing corruption in healthcare management.

REFERENCES

1. Tibbiyotda sun'iy intellektning o'rni va axamiyati | Journal of universal science research
2. Tibbiyotda raqamli texnologiyalar va sun'iy intellektdan foydalanishning o'ziga xosligi – в электронной библиотеке КиберЛенинка
3. Sun'iy intellekt qanchalik xavfli yoki foydali?
4. Sun'iy intellektning tibbiyotda qo'llanilishi va afzalliklari | International conference on multidisciplinary science