AMERICAN ACADEMIC PUBLISHER

INTERNATIONAL JOURNAL OF MEDICAL SCIENCES

ISSN NUMBER: 2692 - 5206 Volume 6. No 01. January ,2026

ASSESSMENT OF THE EFFECTIVENESS OF DIGITAL TECHNOLOGIES AND ARTIFICIAL INTELLIGENCE TECHNOLOGIES IN THE HEALTHCARE SYSTEM: A COMPARATIVE ANALYSIS OF THE SYSTEMS OF UZBEKISTAN AND SOUTH KOREA

Salomova Hanifa Jahanovna,
PhD, Bukhara State Medical Institute,
Preventive medicine, public health and
Department of Healthcare Management.
Tursunova Shamsiya Saidburhon kizi,
Bukhara State Medical Institute,
Preventive medicine, public health and
Master of the Department of Healthcare Management.
shamsiyatursunova@gmail.com

Annotation:

This article analyzes the scientific-theoretical foundations, advantages, and practical outcomes of the digitalization of the healthcare system, as well as the use of artificial intelligence (AI) technologies in this process. It discusses the introduction of digital technologies into the medical field, their stages of development, and areas of application.

The article provides a comparative analysis of the digitalization processes in the healthcare systems of South Korea and Uzbekistan, identifying their similarities and differences. The analysis also covers the strengthening of digital infrastructure, improving the digital competencies of medical professionals, standardization trends of AI-based medical equipment, and the policy prospects of foreign countries in this area. The article includes analyses and examples illustrating the current stage of digital infrastructure development in today's healthcare system.

In addition, the article thoroughly examines the impact of AI technologies on changes in the field of medical devices, as well as their role and significance in the healthcare industry.

Keywords

artificial intelligence in medicine, digital technologies in healthcare, AI diagnostics, wearable medical devices, telemedicine, e-health, innovation, global standardization, digital infrastructure.

Introduction:

"In the current period of increasing human and material resources, the possibilities of fully satisfying the medical needs of the population are insufficient. Therefore, the active use of artificial intelligence in solving this problem is of particular importance," says Professor Mara Lederman, a leading specialist in the field of artificial intelligence in Canada[1].

Indeed, in recent years, telemedicine and other digital healthcare solutions have been increasingly used. In this process, AI technology is attracting attention as an effective tool for solving complex problems in medicine.

Currently, digital technologies and artificial intelligence are one of the most important factors in carrying out fundamental changes in the healthcare sector. Throughout the world, digitalization processes are developing rapidly in order to increase the efficiency of healthcare systems, improve the quality of medical services, and ensure the rational use of resources.

AMERICAN ACADEMIC PUBLISHER
INTERNATIONAL JOURNAL OF MEDICAL SCIENCES
ISSN NUMBER: 2692 - 5206 Volume 6. No 01. January ,2026

In this regard, South Korea stands out as one of the leading countries. In recent years, Uzbekistan has also achieved significant results in the digitalization of the medical system, the implementation of electronic medical records, telemedicine, and AI-based diagnostic systems. These processes contribute to improving the quality of the country's healthcare system and expanding opportunities for convenient and prompt patient care.

Methods:

The digitalization process in the medical system occurred in the second half of the 20th century, in particular in the 1970s, when the concept of artificial intelligence (AI) was formed and the first attempts to process data in electronic form began. However, the initial stages of this trend can be seen in some practices dating back to the 1960s. For example, some hospitals, including El Camino, implemented computer systems that automated management processes.

At the end of the 1980s, unified standards for data exchange between healthcare institutions began to be developed. One of them, the Health Level Seven (HL7) protocol, was an important technological step in the process of medical data transmission. In the 1990s, the term "e-health" emerged, laying the groundwork for the wider application of digital technologies in the healthcare system.

Although the first example of telemedicine was recorded in 1897, modern electronic healthcare systems were widely developed in the late 20th and early 21st centuries. By 2020, electronic medical records (EMR) systems had become standard practice for many hospitals. During the COVID-19 pandemic, the implementation of digital solutions, such as telemedicine, remote monitoring, and artificial intelligence for diagnostics, accelerated significantly.

Today, the healthcare system is undergoing a process of digital transformation. These changes are being implemented through the integration of advanced technologies such as artificial intelligence, machine learning, big data, and wearable devices.

The application of artificial intelligence in medicine was first observed in the 1960s-1970s. The first expert systems developed during this period, such as DENDRAL and MYCIN, helped to conduct chemical analyses and detect bacterial infections. These systems subsequently paved the way for the development of complex diagnostic and analytical programs based on artificial intelligence in medicine.

Digitalization is the process of converting data from traditional form to digital form. In the field of healthcare, it creates the possibility of storing, exchanging, and analyzing medical data in an electronic environment. Artificial intelligence (AI) is used to obtain analytical results from large volumes of medical data, to automate the processes of diagnosis and treatment. The main goal of implementing these technologies is to reduce the impact of the human factor, prevent errors, and increase time efficiency.

South Korea occupies one of the leading places in the world in the digitalization of healthcare. Various artificial intelligence solutions are being implemented in the healthcare system, including in hospitals, institutions, telemedicine, and home care. The government is constantly developing new solutions through collaboration with research institutes and businesses. In the country, the integration of electronic healthcare (e-Health), telemedicine, AI diagnostic systems, and medical data is widely implemented. For example, through the MyHealthWay platform, citizens have the opportunity to manage their health data digitally[3]. AI technologies are effectively used for the early detection of diseases such as cancer, heart disease, and COVID-19.

Results:

AMERICAN ACADEMIC PUBLISHER
INTERNATIONAL JOURNAL OF MEDICAL SCIENCES
ISSN NUMBER: 2692 - 5206 Volume 6. No 01. January ,2026

Index	South Korea	Uzbekistan	Sources (approved / scientific basis)
EHR coverage is around	95-98% (most hospitals and clinics use the EHR system)	15-25% (established in some large city and regional central hospitals, but not yet complete nationwide)	Korea Health Industry Development Institute (KHIDI, 2023); Ministry of Health of Uzbekistan 2023 "Electronic Healthcare" Project Reports
Telemedicine users (estimated annual)	More than 2.3-2.6 million patients in 2023 (with temporary leave after COVID-19)	150-200 thousand users in 2023 (mainly remote consultations, pilot projects)	Korean Ministry of Health and Welfare (2024); Project document "Digital Uzbekistan-2030"
AI medical products (approved by the regulator)	More than 140 AI-based medical devices (MFDS in the fields of cardiology, radiology, pathology - by the Ministry of Food and Drug Safety of Korea)	3-5 AI projects are in the testing phase (mainly diagnostic prototypes; not officially certified)	MFDS AI Device Approval List (2023); WHO Global Observatory on Digital Health; Data from the Ministry of Innovative Development of Uzbekistan

Application of AI technologies in medicine in Uzbekistan. As of 2023, although the application of AI technologies in medicine is still at an early stage, some large projects and pilot programs have been successfully tested.

Practical implementation of artificial intelligence technologies in healthcare in Uzbekistan. In recent years, Uzbekistan has begun large-scale work on the digitalization of the healthcare system and the introduction of artificial intelligence (AI) technologies. On the basis of the Presidential Decree of December 28, 2023 (PQ-415), a national digital healthcare system was created, aimed at automating medical processes, optimizing management, and expanding the coverage of medical services for the population. Within the framework of the resolution, UZINFOCOM LLC, as a single integrator, assumes responsibility for the creation of the platform, its technical support, and ensuring information security.

The main directions of this project include the digitalization of primary and inpatient medical institutions. In particular, through the "Electronic Polyclinic" and "Electronic Hospital" systems, patient data will be stored in a single database, diagnostic image exchange and broadcasting systems will be implemented, as well as electronic prescriptions and disease registers will be created, which will allow optimizing healthcare processes using AI.

The project also provides for training medical workers based on digital technologies and artificial intelligence. The implementation of interactive services through mobile applications, as well as data transmission and analysis systems, will be carried out based on the international

AMERICAN ACADEMIC PUBLISHER
INTERNATIONAL JOURNAL OF MEDICAL SCIENCES
ISSN NUMBER: 2692 - 5206 Volume 6. No 01. January ,2026

standard FNIR (Fast Healthcare Interoperability Resources). This approach allows for quick and accurate decision-making within the healthcare system.

In this process, funding sources are provided through grants and loans from the state budget, international financial institutions, and KfW Bank. The implementation of the project will be carried out in stages and coordinated under the supervision of the Minister of Health and the Minister of Digital Technologies.

Thus, it can be confidently stated that Uzbekistan is taking an important step towards improving medical services based on digital and AI technologies, consolidating information flows into a single platform, and creating an innovative management system.

Currently, in the healthcare sector of Uzbekistan, the use of AI modules in diagnostic, analytical, and management systems has been established in some large medical institutions.

For example, in the field of radiology and medical image analysis, AI-based image analysis systems have been implemented at the National Oncology Center in Tashkent and the Republican Emergency Medical Care Center, which allow automatic analysis of 5-10% of medical images.

In the field of telemedicine and remote diagnostics, the "EMERGENCY.uz" and "MedElement" platforms operate, through which doctors conduct remote consultations. In some cases, AI algorithms in these systems help to determine the probability of disease based on patient data (by 20-25%).

Electronic medical records (EMR) and predictive analysis systems are being implemented within the framework of the "E-Polyclinic" and "Emergency Medical Care Information System" projects. These systems allow for the storage of patient data in a single electronic database, their analysis, and support for medical decisions. The Pharmaceutical Agency of Uzbekistan is testing a system for analyzing information about medicines based on artificial intelligence.

In the field of healthcare management and medical statistics, AI technologies are used for epidemiological analysis. Especially during the COVID-19 pandemic, the analytical platform of the Ministry of Health played an important role in predicting the dynamics of the disease based on AI algorithms.

In 2022, the National Center for the Development of Artificial Intelligence was established (under the Ministry of Innovative Development), which coordinated scientific research and applied projects in the field of AI. At the same time, work has begun on combining all medical data in the country into a single electronic database through the "E-Health" integration platform.

In the matter of personnel training, the subjects "Medical Informatics" and "Digital Health" are included in the curricula of medical universities, including Bukhara, Andijan, and Tashkent Medical Institutes, and are aimed at increasing the digital competence of medical specialists in the future.

Currently, the digital transformation of medicine in Uzbekistan is developing at a consistent pace. This process is reaching a new level, especially through the integration of artificial intelligence (AI) technologies into practical medicine. The country, in partnership with countries such as the Republic of Korea, Israel, and Russia, is gradually implementing projects focused on AI-based diagnostic systems, automatic processing of medical data, and supporting clinical decisions. Such cooperation creates an important basis for the introduction of modern medical technologies in local institutions, improving the qualifications of doctors, and further improving the quality of medical services provided to patients. Within the framework of the "Korea International Cooperation Agency (KOICA) " program, special trainings on the use of AI technologies are being organized for Uzbek doctors. In addition, in 2025, it is planned to launch a scientific laboratory project "AI in Medicine" in cooperation with the Bukhara State Medical

AMERICAN ACADEMIC PUBLISHER
INTERNATIONAL JOURNAL OF MEDICAL SCIENCES
ISSN NUMBER: 2692 - 5206 Volume 6. No 01. January ,2026

Institute and South Korea. Currently, the center, whose organizational work is nearing completion, is engaged in the development of advanced artificial intelligence models in the field of diagnostics, prevention, and clinical analysis.

By 2026, it is planned to develop three national algorithms for the early detection of cancer, cardiovascular diseases, and diabetes mellitus based on AI. By 2030, it is planned to digitize 80% of the healthcare system, including the introduction of AI modules in at least 40%. At the same time, the main attention is paid to preventive medicine, that is, early detection of diseases and their prevention.

It should also be noted that although Uzbekistan has not yet fully formed its AI medical infrastructure, it is one of the most active participants in this area among the countries of Central Asia. The strategies being developed by the government, international scientific cooperation, and the digital transformation of medicine create a solid foundation for the widespread introduction of artificial intelligence technologies.

According to forecasts of experts and specialists, the global market for artificial intelligence in medicine will grow sharply in the next decade. According to Grand Viyew Research, the annual growth rate (CAGR) of the healthcare AI market between 2024 and 2030 is 38.5 percent [6]. It is also projected that by 2025, India's investments in AI technologies in medicine will reach 11.78 billion US dollars, which will bring additional economic benefits to the country's economy by 1 trillion dollars by 2035 [7]. Undoubtedly, artificial intelligence is a complex and rapidly developing technological field with great potential, allowing for revolutionary changes in various fields of medicine. AI is considered an important tool in improving the quality of medical care, reducing errors, and automating healthcare processes.

Discussion:

In recent years, significant reforms have been carried out in Uzbekistan in the direction of digitalization of the healthcare system. The "Digital Uzbekistan - 2030" Strategy, adopted in 2020, defined the main directions for the implementation of digital technologies in the country. Within the framework of this program, the goal is to fully digitalize the healthcare system, conduct medical services in electronic form, and develop the use of artificial intelligence capabilities.

The priority tasks of the 25th goal of the Development Strategy of New Uzbekistan for 2022-2026 for the development of the digital economy have a direct impact on the digital transformation of the healthcare sector. In particular, the expansion of digital infrastructure, coverage of all settlements with high-speed internet, and ensuring uninterrupted connection along highways will create conditions for the effective functioning of telemedicine, remote diagnostics, and AI-based analysis systems in medical institutions. The goal of increasing the level of digitalization in the real sector, finance, and banking system to 70% by 2026 is also combined with the automation of operational processes in medicine, the widespread introduction of the e-Health ecosystem, and the integration of AI modules that support clinical decisions. Also, the strategy aimed at increasing the software industry by 5 times and IT exports by 10 times will expand the possibilities of developing domestic AI diagnostic systems, electronic medical record platforms, and intelligent monitoring devices for medicine. As a result, the growth of the digital economy will accelerate innovations in the field of medicine and serve the modernization of healthcare in accordance with global standards.

According to our observations, in practice, this process is carried out in several directions. In particular, the system of electronic medical records is being gradually introduced, telemedicine services are being expanded, and online monitoring of drug circulation and AI-based diagnostic

AMERICAN ACADEMIC PUBLISHER
INTERNATIONAL JOURNAL OF MEDICAL SCIENCES
ISSN NUMBER: 2692 - 5206 Volume 6. No 01. January ,2026

programs are being tested in practice. These innovations make it possible to create convenience for patients, simplify the work of doctors, and reduce the human factor in healthcare.

At the same time, there are some problems in the digitalization process. One of the main ones is the insufficient development of the IT infrastructure and the lack of digital skills among specialists. The speed of internet and the quality of technical equipment in rural areas also hinder the full implementation of some projects.

When comparing the experience of South Korea and Uzbekistan, significant differences are observed.

In South Korea, the level of digitalization is about 95%, and artificial intelligence technologies are actively used in almost all areas of medicine - diagnostics, monitoring, and data analysis. Telemedicine has been implemented throughout the country, and electronic medical records are managed through a single national system. Constant financial support from the state ensures the sustainable development of digital medicine.

In Uzbekistan, the level of digitalization is currently estimated at around 60 percent. Artificial intelligence technologies are being gradually introduced, and telemedicine services are mainly used in large cities and central clinics. Electronic medical records are being tested in some medical institutions. The prolongation of the testing period is explained by the weak efforts of the administration to transition to a new working style. Despite this, the volume of state investments in this area and the growing demand for implementation will serve as an important foundation for the full digitalization of the healthcare system in the future. Of course, the entry of a new, relatively younger generation of personnel into key positions in the system will accelerate this process.

Overall, the reforms initiated in the digitalization of Uzbekistan's healthcare system are paving the way for a new stage in modern medicine. This process will allow improving the quality of medical services using artificial intelligence technologies, accelerating the analysis process, and providing more effective assistance to patients.

The experience of South Korea shows that the stability of state policy, infrastructure, and training of specialists are crucial in the digitalization of healthcare. Therefore, it is also important for Uzbekistan to strengthen technological infrastructure in this area, create medical data analysis centers based on AI, and expand international cooperation. It is also necessary to introduce digital literacy programs for medical workers and retrain doctors and nurses in the field of IT.

Artificial intelligence (AI) technology has also caused significant changes in the field of medical devices in recent years and has played a decisive role in the healthcare industry. Medical devices using AI technology increase diagnostic accuracy, treatment effectiveness, and contribute to the provision of personalized healthcare services. Although these achievements in medical devices have the potential to dramatically improve healthcare quality, it is important to regulate and standardize all actions to ensure their reliability and safety.

Standardization of AI medical devices goes beyond technological development and is becoming a decisive factor in determining competitiveness in the global market. International standardization not only ensures the quality and safety of medical devices, but also ensures cooperation in the international market, creating a basis for their uninterrupted use in various countries and healthcare systems. In particular, unlike traditional medical devices, artificial intelligence medical devices require constant updating and improvement due to their software-based nature. Therefore, there should be clear international standards and rules to support this.

Such global standardization plays a crucial role in protecting patient safety, increasing the reliability of medical devices, and promoting technological innovation across borders. As the use of AI medical devices is increasing globally, governments and international organizations are

AMERICAN ACADEMIC PUBLISHER
INTERNATIONAL JOURNAL OF MEDICAL SCIENCES
ISSN NUMBER: 2692 - 5206 Volume 6. No 01. January ,2026

accelerating their efforts to standardize. Large countries, including the United States of America, European Union countries, and Japan, are creating a regulatory framework for artificial intelligence medical devices, and the International Electrotechnical Commission (IEC) and the International Organization for Standardization (ISO) are also making various efforts to create relevant standards.

These international standardization efforts contribute to the unification of regulatory requirements across countries and the creation of a consistent regulatory environment in the global market, which is necessary to ensure international competitiveness.

South Korea is also accelerating standardization and regulatory reform to support the development of AI medical devices. The government promotes the development and commercialization of AI medical devices through laws and guidelines supporting innovative medical devices, thereby supporting local companies in ensuring competitiveness in the global market. However, many difficulties remain. In particular, efforts are being made to harmonize local standards with international ones, to ensure the recognition and international competitiveness of local technologies in foreign markets.

Conclusions and suggestions**:**

Here are some reasons why there is currently no full access to AI technologies in Uzbekistan:

• Lack of information for AI - a unified, anonymized database of medical data has not yet been fully formed.

• Lack of specialists - the number of trained specialists in the field of medical IT and AI is very low.

• The legal basis is incomplete - the legal responsibility of the diagnosis based on the results of AI is not clearly defined.

• Technical infrastructure - some regional hospitals have limited internet and server capabilities.

According to official statistics (based on sources):

• As of 2024, an electronic medical record system has been implemented in 35% of medical institutions.

• AI-based analysis systems (X-ray/CT diagnostics) are currently operating in 8 major centers.

• 40% of telemedicine services use artificial intelligence modules in test mode.

In short, AI technologies can be used in the following main areas:

- Medical Data Analysis: Machine Learning (ML) algorithms perform analysis based on historical medical data, optimize the decision-making process, and help improve health outcomes.

- Specific (personalized) medicine: With the help of AI, individual treatment strategies are developed, taking into account the patient's genetic characteristics, lifestyle, environmental conditions, and medical history.

- Disease prediction: through predictive models, doctors have the opportunity to determine the probability of developing a certain disease in a patient and prevent it at an early stage.

- Automatic interpretation of diagnostic tests: artificial intelligence helps in the early detection of cancer, heart diseases, and other pathologies by analyzing MRI, CT, or X-ray images.

Thus, artificial intelligence is becoming a modern tool in medicine that complements the human factor, but does not replace it, but serves to conduct healthcare processes more effectively, accurately, and quickly.

AMERICAN ACADEMIC PUBLISHER
INTERNATIONAL JOURNAL OF MEDICAL SCIENCES
ISSN NUMBER: 2692 - 5206 Volume 6. No 01. January ,2026

List of used literature:

1. South Korean Medical Newspaper (http://www.bosa.co.kr).
2. MDPI, National Institutes of Health (NIH)
3. Ministry of Health and Welfare, Korea, 2023
4. Decree of the President of the Republic of Uzbekistan dated 05.10.2020 No. UP-6079. Decree on the approval of the "Digital Uzbekistan-2030" Strategy and measures for its implementation.
5. World Health Organization (WHO) 2023 reports.
6. Grand Viyew Research. "GVR Report coverArtificial Intelligence In Healthcare Market Size, Share, And Trends Analysis Report By Component (Software Solutions, Hardware, Services), By Application (Virtual Assistants, Connected Machines), By Region, And Segment Forecasts, 2022 - 2030, https://www.grandviewresearch.com/industry-analysis/artificial-intelligence-ai-healthcare-marke." Accessed 7 July 2024.
7. INDIAai. "AI in healthcare: India's trillion-dollar opportunity, https://indiaai.gov.in/research-reports/ai-in-healthcare-india-s-trillion-dollar-opportunity." Accessed 7 July 2024.
8. Esteva, A., Robicquet, A., Ramsundar, B., Kuleshov, V., DePristo, M., Chou, K.,... & Dean, J. (2017). Guide for in-depth study in the field of healthcare. Natural Medicine, 25 (1), 24-29.
9. South Korean Medical Newspaper (http://www.bosa.co.kr).
10. Ministry of Innovative Development - "Concept of Artificial Intelligence," 2021.
11. Kim, H., & Lee, J. (2022). AI-based Diagnostics in Korea: Implementation and Challenges. Journal of Medical Informatics.
12. KOICA Uzbekistan AI Healthcare Project Report, 2023.
13. Ministry of Health and Welfare, Republic of Korea. (2023). Digital Health Strategy Report.
14. Decree of the President of the Republic of Uzbekistan dated 05.10.2020 No. UP-6079. Decree on the approval of the "Digital Uzbekistan-2030" Strategy and measures for its implementation.
15. Ministry of Health of the Republic of Uzbekistan - reports of the "E-Sog'liq" information system, 2023.
16. Ministry of Health of the Republic of Uzbekistan. (2024). Reports of the "Digital Healthcare" project.
17. UNDP Uzbekistan - Digital Transformation in Healthcare, 2023.
18. World Bank Digital Health in Uzbekistan Report, 2024.
19. World Health Organization (WHO). (2023). Global Strategy on Digital Health 2020-2025.