УДК 004:61

***Ибрагимова Д. ассистент***
***Самаркандский государственный медицинский университет***
***Узбекистан, Самарканд***

***Собиров О. студент***
***Самаркандский государственный медицинский университет***
***Узбекистан, Самарканд***

***Абдуганиев У. студент***
***Самаркандский государственный медицинский университет***
***Узбекистан, Самарканд***

***Рустамова А. студентка***
***Самаркандский государственный медицинский университет***
***Узбекистан, Самарканд***

# ТЕКУЩИЙ УРОВЕНЬ ПРИМЕНЕНИЯ СОВРЕМЕННЫХ ИНФОРМАЦИОННЫХ ТЕХНОЛОГИЙ И ИХ РОЛЬ В СБОРЕ ДАННЫХ, ДИАГНОСТИКЕ И ЛЕЧЕНИИ В РАЗЛИЧНЫХ ОБЛАСТЯХ МЕДИЦИНЫ

***Аннотация.*** *В статье рассматривается современный уровень применения информационных технологий в сфере здравоохранения и анализируется их роль в сборе медицинских данных, диагностике и лечении. Подчёркивается значение электронных систем здравоохранения, медицинских информационных систем, телемедицины и технологий искусственного интеллекта для повышения качества, эффективности и доступности медицинских услуг. Анализ текущей практики здравоохранения показывает, что системы электронных медицинских карт и поддержка принятия решений на основе искусственного интеллекта улучшают структурированность и доступность данных о пациентах, а также точность и скорость выявления заболеваний. Подчёркивается, что интеграция информационных технологий способствует точной диагностике, персонализированному лечению и эффективному управлению ресурсами здравоохранения.*

***Ключевые слова:*** *информационные технологии, здравоохранение, медицинские данные, диагностика, лечение, телемедицина, искусственный интеллект.*

***Ibragimova D. assistant***
***Samarkand State Medical University***
***Uzbekistan, Samarkand***

***Sobirov O. student***
***Samarkand State Medical University***
***Uzbekistan, Samarkand***

***Abdug'aniyev U. student***
***Samarkand State Medical University***
***Uzbekistan, Samarkand***

***Rustamova A. student***
***Samarkand State Medical University***
***Uzbekistan, Samarkand***

# THE CURRENT LEVEL OF APPLICATION OF MODERN INFORMATION TECHNOLOGIES AND THEIR ROLE IN DATA COLLECTION, DIAGNOSIS, AND TREATMENT IN VARIOUS MEDICAL FIELDS

***Abstract.*** *This article examines the current level of application of modern information technologies in the healthcare sector and analyzes their role in medical data collection, diagnosis, and treatment processes. The study highlights the significance of electronic health systems, medical information systems, telemedicine, and artificial intelligence technologies in improving the quality, efficiency, and accessibility of healthcare services. The analysis of current healthcare practices shows that electronic health record systems and artificial intelligence-based decision support improve the structure and accessibility of patient data and the accuracy and speed of disease detection. The research emphasizes that the integration of information technologies contributes to accurate diagnostics, personalized treatment, and effective management of healthcare resources.*

***Keywords:*** *information technologies, healthcare, medical data, diagnosis, treatment, telemedicine, artificial intelligence.*

## Introduction

The rapid development of modern information technologies has led to profound transformations in various sectors, including healthcare. Today, healthcare systems increasingly depend on digital solutions to manage complex

medical data, enhance diagnostic accuracy, and improve treatment outcomes [1]. The adoption of information technologies has become a strategic priority for healthcare systems worldwide, as it enables cost-effective service delivery and improved patient care [1].

In modern medicine, timely access to accurate medical information plays a critical role in decision-making processes. Therefore, the implementation of advanced information technologies is essential for ensuring the effectiveness and sustainability of healthcare systems. This study aims to analyze the current level of information technology usage in healthcare and evaluate its role in data collection, diagnosis, and treatment across different medical fields.

## Materials and Methods

The study is based on an analysis of current healthcare practices and of the scientific literature on health information systems.

## Results and Discussion

### *Current Level of Information Technology Usage in Healthcare*

At present, healthcare institutions actively implement various information systems, including Electronic Medical Records (EMR), Hospital Information Systems (HIS), Laboratory Information Systems (LIS), and Picture Archiving and Communication Systems (PACS) [2]. These systems facilitate efficient management of patient information and enable healthcare professionals to access medical data in real time.

The widespread digitalization of healthcare processes has reduced administrative workload, minimized medical errors, and enhanced coordination among healthcare providers [3]. Additionally, cloud-based technologies allow secure storage and sharing of medical data, supporting collaborative decision-making and continuity of care [4].

### *Application of Information Technologies in Diagnostic Processes*

Information technologies play a vital role in modern diagnostic practices. Medical imaging technologies such as computed tomography (CT), magnetic resonance imaging (MRI), and digital radiography rely heavily on advanced software for image processing and analysis.

Artificial intelligence and machine learning algorithms have become increasingly important in diagnostics [5]. These technologies assist clinicians in detecting diseases at early stages, analyzing complex medical images, and reducing diagnostic errors. The integration of decision-support systems enhances diagnostic accuracy and supports clinical decision-making [6].

Healthcare organizations utilize a variety of digital tools, including electronic medical records (EMR), hospital information systems (HIS), laboratory information systems (LIS), and medical imaging platforms. These technologies streamline patient data management, improve workflow efficiency, and reduce the likelihood of errors.

### *Key Findings*

The analysis of current healthcare practices demonstrates that the integration of modern information technologies significantly improves the efficiency of medical data management, diagnostic accuracy, and treatment processes. The use of electronic health record systems has resulted in more structured and accessible patient data, enabling healthcare professionals to retrieve information promptly and make informed clinical decisions.

The findings indicate that healthcare institutions implementing digital diagnostic tools, such as computer-assisted imaging systems and artificial intelligence-based decision support, show higher accuracy in disease detection and reduced diagnostic time. In particular, the application of machine learning algorithms contributes to the early identification of pathological conditions and supports clinicians in complex diagnostic cases.

## Conclusion

In conclusion, modern information technologies have become an indispensable component of contemporary healthcare systems. Their application in data collection, diagnosis, and treatment significantly improves the quality, efficiency, and accessibility of medical services. The ongoing integration of advanced digital technologies is expected to play a crucial role in shaping the future of healthcare and improving patient outcomes.

## Использованные источники / References


1. World Health Organization. Global strategy on digital health 2020–2025. Geneva: WHO, 2021.
2. Shortliffe E.H., Cimino J.J. (eds.) Biomedical Informatics: Computer Applications in Health Care and Biomedicine. Cham: Springer, 2021.
3. Bates D.W., Gawande A.A. Improving safety with information technology // New England Journal of Medicine. 2003. Vol. 348, No. 25. P. 2526–2534.
4. Griebel L., Prokosch H.-U., Köpcke F., et al. A scoping review of cloud computing in healthcare // BMC Medical Informatics and Decision Making. 2015. Vol. 15. Art. 17.
5. Esteva A., Robicquet A., Ramsundar B., et al. A guide to deep learning in healthcare // Nature Medicine. 2019. Vol. 25, No. 1. P. 24–29. DOI: 10.1038/s41591-018-0316-z.
6. Topol E. Deep Medicine: How Artificial Intelligence Can Make Healthcare Human Again. New York: Basic Books, 2019.