

Practical Conference of V.I. Vernadsky Taurida National University for the 106th Anniversary of the University and the Crimean Forum, October 17–18, 2024. Kyiv–Lviv–Toruń: Liha-Pres, 2024. – p. 20–23. – URL: <http://catalog.liha-pres.eu/index.php/liha-pres/catalog/view/336/9956/22536-1>

3. V. O. Dubko, V. B. Raspopov, V. M. Semianovskiy. *On Experiments with the Use of AI in the Educational Practice of Humanities Students*. In: The Role of Innovation in the Transformation of Modern Science. Proceedings of the VIII International Scientific-Practical Conference (Kyiv, December 27–28, 2024). NGO “Institute of Innovative Education”; NUCPi NAS of Ukraine. Kyiv–Zaporizhzhia: AA Tandem, 2024. – p. 3–7. – URL: <https://www.calameo.com/read/00316837227a13200be04>

4. Raspopov, Viktor. *Mystical Reincarnation of Maksym Rylskiy's Original Literary Style Using Artificial Intelligence "ChatGPT-4"*. In: International Scientific-Practical Conference “Key Figures in the Preservation of National Heritage and Development of Cultural Practices Amid Societal Challenges (on the 130th anniversary of the birth of scientist, poet, and artist Maksym Rylskiy)” (Kyiv, March 19–20, 2025). IMFE of the NAS of Ukraine. Kyiv, 2025. – p. 42–44. – URL: <https://www.etnolog.org.ua/pdf/stories/zbirnyky/2025/tezy.pdf>

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ADVANCING HEALTHCARE THROUGH DIGITAL PLATFORMS SUCH AS EPIC, CERNER, MEDITECH

1. Introduction & Historical Context

Historically, healthcare was fragmented: records were paper-based, stored in silos, and vulnerable to loss or error. Clinical decision-making was slowed by manual workflows, and inter-provider communication was inefficient.

Since the 1960s–70s, EHR systems like Epic, Cerner, and Meditech have revolutionized how healthcare data is stored, shared, and utilized - evolving into intelligent, interoperable ecosystems that integrate AI, telehealth, and analytics.

These systems are now considered foundational to modern healthcare delivery, enabling providers to deliver higher quality, safer, and more coordinated care. They offer real-time access to comprehensive patient data, reduce redundancies, and support regulatory compliance.

2. Epic Systems: Expanded Functionality & Benefits

Epic is one of the most widely used EHR platforms in the U.S., serving major academic centers and health networks. Its comprehensive functionality allows organizations to manage every aspect of the patient journey.

Core Functionality

- Patient Management: Facilitates scheduling, registration, and real-time bed tracking.
- Clinical Tools: Enables real-time documentation, CPOE (Computerized Provider Order Entry), and ePrescribing.
- Care Coordination: Provides tools for secure messaging, shared patient records, and built-in care pathways.
- Revenue Cycle: Integrates billing, claims submission, denial management, and collections.

- Patient Engagement: MyChart empowers patients to book appointments, message providers, and refill prescriptions.
- Integration: Connects seamlessly with laboratory, imaging, and pharmacy systems; interfaces with third-party health devices.

Key Benefits

- Interoperability: Epic’s “Care Everywhere” allows cross-institutional record sharing.
- Enhanced Patient Safety: Reduces duplicate tests, ensures allergy and medication reconciliation.
- Operational Efficiency: Streamlines provider workflows, reduces paperwork, and saves time.
- Data-Driven Decisions: Offers powerful analytics for population health and quality initiatives.
- Scalable for **Growth**: Used by some of the largest systems like Mayo Clinic, yet customizable to local needs.

3. AI Integration: Current and Future Use

Artificial intelligence (AI) is transforming EHR platforms from static record-keeping tools into dynamic decision-making aids.

Current AI Capabilities

- Clinical Decision Support (CDS): AI flags drug interactions, offers evidence-based suggestions, and supports complex diagnoses.
- Predictive Models: Platforms now include early warning systems for patient deterioration, sepsis, or risk of readmission.
- Natural Language Processing (NLP): Extracts useful insights from clinical notes and transcribes dictations into structured data.
- Administrative Automation: AI improves accuracy in billing, streamlines coding, and ensures documentation compliance.

Future Directions

- Ambient AI Assistants: Tools like Nuance DAX can listen to clinical encounters and auto-generate SOAP notes.
- Personalized Care Plans: AI can recommend tailored, evidence-based treatment plans for individual patients.
- Population Health AI: Identifies health trends at the community level to drive preventive care.
- AI-Driven Triage: Real-time triage support in emergency departments and telehealth platforms.

4. Cost, Scalability & Considerations

Implementing an EHR system is a massive undertaking, both financially and logistically. Cost varies by vendor, organization size, and implementation model.

EHR Vendor	Cost Range	Ideal For	Notes
Epic	\$500M–\$1B+	Large academic & health systems	Most robust but costly; requires high-level IT support
Cerner (Oracle)	\$50M–\$500M	Regional hospitals, large systems	Used by VA/DoD; strong analytics tools
Meditech	\$10M–\$100M	Community hospitals	Affordable; newer versions offer cloud-based options

Ongoing Costs

- Licensing Fees: Annual subscriptions and usage-based fees
- Training: For staff, providers, and IT teams

- Hardware: Servers, workstations, mobile access
- Integration: With lab, radiology, pharmacy, and third-party systems
- Security: Encryption, firewalls, updates, and breach response plans

Despite high costs, ROI can be achieved through improved efficiency, reduced errors, better billing, and stronger patient satisfaction.

5. International Use: Europe & Ukraine

Europe: Epic and Cerner are in use across several European nations, particularly in national health systems like the NHS (UK), and in the Netherlands and Nordic countries.

Key to successful deployment is compliance with GDPR (General Data Protection Regulation), a stringent privacy law governing:

- Patient consent for data use
- Secure data storage and processing
- Restrictions on data transfer outside the EU
- Fines for non-compliance: up to €20 million or 4% of global revenue

Localization, language adaptation, and alignment with national reimbursement structures are also essential.

Ukraine: Ukraine presents both challenges and opportunities:

- War-damaged infrastructure requires resilient cloud-based systems.
- There's potential to leapfrog paper systems and adopt digital-first models.
- Platforms like OpenMRS or Meditech's cloud version could be adapted.
- Key requirements: strong broadband, healthcare IT training, policy support, and public-private partnerships.

With proper investment, Ukraine could become a digital health leader in Eastern Europe.

6. Closing Thoughts

EHRs today are more than data repositories. They are intelligent platforms transforming:

- Patient Care: Through real-time analytics and clinical support tools
- Operations: Via workflow automation, documentation efficiency
- Public Health: Leveraging big data to monitor trends and guide interventions

Challenges Remain:

- High implementation and maintenance costs
- Provider burnout due to poorly optimized workflows
- Limited accessibility in under-resourced regions

But with the right strategies - including ethical AI, user-centered design, and international collaboration - digital platforms can create equitable and sustainable healthcare ecosystems.

Key Points

- Epic, Cerner, and Meditech offer robust, AI-enhanced platforms.
- AI is revolutionizing diagnostics, workflows, and population health.
- Global scalability is possible with cloud and policy innovation.
- GDPR is essential for understanding international deployment.
- The future lies in equitable, ethical, and sustainable digital health systems.

References

1. Epic Systems Corporation. (2025). *Epic*. Retrieved April 6, 2025, from <https://www.epic.com/>
2. Gomez-Gonzalez, E., & Gomez-Gutierrez, E. (2020). *Artificial intelligence in medicine and healthcare: Applications, availability, and societal impact*. European Commission. <https://doi.org/10.2760/047666>
3. Panigutti, C., Beretta, A., Fadda, D., Giannotti, F., Pedreschi, D., Perotti, A., & Rinzivillo, S. (2023). Co-design of human-centered, explainable AI for clinical decision support. *ACM Transactions on Interactive Intelligent Systems*, 13(4), Article 21. <https://doi.org/10.1145/3587271>