

Artificial Intelligence and Electronic Records in Healthcare Sector: Benefits and Challenges

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ABSTRACT

This article explores the use of electronic records and artificial intelligence in healthcare, providing guidance for healthcare professionals and record keepers. It addresses common challenges in managing patient records and offers insights into effective data organization strategies. By incorporating previous research, the article aims to equip professionals with tools to enhance their record management practices. Emphasizing technology adoption and system implementation, it serves as a valuable resource for healthcare leaders, record managers, and those involved in healthcare information systems, helping them navigate the complexities of healthcare data management and improve patient information handling techniques.

INTRODUCTION

The necessity for strategic business solutions is met by business demands (Norhayati, Hasnah, & Halida, 2018). The idea of security has been changing in the corporate sector and is no longer just a technological problem. According to this viewpoint, information security is a valuable resource since it aims to connect with the business factors of the organization that affect the safeguarding of information assets. Since protecting knowledge and information is essential to success, competitiveness, and survival in the globalized market, these factors are now viewed as integrated components of the core company.

Managing healthcare records in the healthcare industry is crucial. This is because it is the most important for healthcare to provide good care to patients and the organization, but numerous constraints have been identified that make it hard to do this effectively. Effective record management is crucial for optimizing organizational performance while minimizing expenses. This means finding ways to improve accuracy and performance without spending too much money. Implementing an effective system and incorporating artificial intelligence is a great approach.

Objectives

The objective of this paper is to discover how artificial intelligence (AI) and electronic document records management systems (EDRMS) are being used in the healthcare industry. The primary objective is to investigate the efficacy of integrating AI and EDRMS in the healthcare industry, as well as users' perceptions of their use for record management. The article's effective patient record management activities highlight the value of utilizing electronic technology in the healthcare industry.

1. To explore the potential benefits of integrating artificial intelligence (AI) and electronic records management systems (EDRMS) in healthcare, focusing on improved efficiency, accuracy, and accessibility of patient data.
2. To examine the challenges associated with the adoption and implementation of AI and EDRMS in healthcare, including issues of data security, regulatory compliance, and organizational resistance.
3. To analyze the perceptions of healthcare professionals, administrators, and record managers regarding the usability, effectiveness, and reliability of AI and EDRMS in medical record management.
4. To provide insights and recommendations for addressing challenges and maximizing the benefits of AI and EDRMS integration in healthcare, including strategies for training, system acceptance, and policy development.

Problem Statement

One of the common issues is when it comes to managing patient data. Information is gone across many systems and departments. The required records for patients care during health-care service delivery are not locatable or traceable (Marutha, N. S., 2020). In a hospital, various departments work together to provide patients care. Disorganized records may lead to repeated tests, human errors, or overlooked diagnoses. When patient history or data do not centralize by one system it complicates understanding of their overall health and is unable to deliver their best service.

The second issue is that it can be difficult to preserve patient data and sensitivity. A reactive, bottom-up, technology-centric strategy to identifying security and privacy requirements is insufficient to safeguard the company and its patients, claim Abouelmehdi, Beni-Hssane, Khaloufi & Saadi (2017). The two most crucial aspects that must be controlled in the healthcare sector are security and privacy. For hospitals and other healthcare providers to keep their good name and competitive advantage, these data must be safeguarded. Patients and healthcare providers may be shielded from fraud and misconduct by data security and privacy. Records of permanent value must be preserved and handled in a storage medium that is secured in terms of protection against unauthorized access, loss, destruction, theft and disaster (Marutha, 2020).

Nature of human beings often tends to make a mistake when entering data with or without they realize it. Some of the mistakes resulting in outdated information and insufficient information which lead to bad treatment decisions for patients. Mistakes in treatment can be very serious and even lead to loss of life, so it is important to manage this data accurately. The risks of losing each significant record by not being captured must also be considered (Marutha, 2020). As human, we sometimes come back in the certain period of time to seek for the current medical advice or treatment, if the hospital and clinic fail to maintain the accuracy, current, and comprehensive records they will end up providing a service that is unsatisfactory to the patient. According to the usual procedure in health industry, they depend heavily on precise information to make accurate decisions. According to (Modiba, M.,2023) AI is able to capture records,

remove the staples and digitize and classify records faster and easily that are embedded in the robotic machine. AI may be programmed to perform such records management services and would not make the mistakes that HI does (Modiba, M.,2023).

Next issue is selecting the most suitable system for the healthcare provider. Because they are incompetent in running the system and unaware of its advantages, users refuse to use EDRMS (Azlina et. al, 2018). In any organization, staff members may struggle to use the system efficiently and feel demotivated about adjusting to the new changes if the systems are complex. The absence of support and unfavorable response to any change from the administrative, nursing, and medical communities is the most important reason why NEHR system implementations fail (Fragidis & Chatzoglou, 2018). In addition, the transition to digital records can be overwhelming for certain professionals, some of them already exhausted by their daily tasks which demand too much time and energy. This can result in dissatisfaction and resistance to change and implementing the systems in healthcare facilities is becoming more difficult.

In addition, implementing or selecting a system always involves some expenses. Taking care of health record systems, particularly those that rely on electronic health records (EHRs), can cost a lot of money. More specifically, "EHR project funding" is not so highly ranked and it is reported as the fifth most important difficulty (Fragidis, & Chatzoglou, 2018). This is especially challenging for smaller healthcare providers or those with limited budgets. They often find it hard to bear the set up cost or ongoing updates of these systems and improve their systems due to the cost impact. This financial constraint can make it challenging for them to stay updated with new technology and provide the best service to the client or patient.

Artificial intelligence can perform tasks automatically, but in the beginning, we need to train staff before using AI. Records management professionals should become acquainted with the application process so they can use AI and robotic machines for records administration in an appropriate manner (Modiba, 2023). Staff members may find this training difficult, particularly given their hectic schedules. The AI mechanism must be effectively reskilled since algorithms, technology, retention schedules, and records management are constantly changing (McFarlane, 2016). Institutions that used AI for digital records management in its first stages faced difficulties with classification and categorization of records, according to Maderer (2017). The main issue is that AI is unable to simply start handling records effectively on its own and robotic systems need to be trained properly to operate correctly because it's a step-by-step process.

This article emphasizes that improvement in patient outcomes and keep data secure, it's essential to address these challenges in healthcare record management. This can be accomplished by utilizing advanced technology and providing proper training for staff to manage records efficiently. As a result, the organization can reduce costs while maintaining a high level of accuracy in its operations.

LITERATURE REVIEW

One of the biggest shifts in patient information management and care delivery today is the implementation of digital records and artificial intelligence (AI) in healthcare. This transition is aiming to enhance health care in terms of quality and efficiency as well accessibility but at the same time, there are hurdles that need to be tackled.

Digital Records in Healthcare

Electronic Health Records (EHRs) and Electronic Medical Records (EMRs) are on the place of timely paper records in health care. Today these digital systems securely and effectively collect, store and provide patient history, diagnoses, medications, test results (lab tests) as well as treatment plans. This shift means

that healthcare teams can now retrieve patient information on demand, with guaranteed accuracy, to improve decision-making, minimize error and file sharing and communication within a team of healers.

EHRs and EMRs have also simplified the patient care tracking process, enhancing long-term health maintenance. In addition, a digital record decreases administrative costs tied to paper storage and manual data entry (allowing more resources to flow through to patient care).

Countries Excelling at Implementing HER

Fragidis, & Chatzoglou, (2018) mention the countries that excelling at the implementation of EHR as below:

Denmark: Denmark is known as the international leader in the integration of eHealth in healthcare delivery services, with the example of the nationwide system for EHR implementations. Its approach serves as a blueprint for other nations looking to scale its health IT infrastructure.

Sweden: Like Denmark, Sweden is working on regional and national level to build and improve its eHealth systems. Their successful EHR implementation is attributed to the emphasis of compatibility and security in their systems.

Norway: Norway has a government agency, the National Health Network, which is in charge of developing a uniform information exchange network for the health providers. Such efforts have established Norway as a global leader in the EHR landscape.

Canada: Of countries not in Europe, Canada is recognized as having implemented comprehensive electronic health records (EHR) nationally. Public funding was used effectively in the country to sustain initiatives related to health IT, which played a critical role in the success.

Australia: Like Canada, Australia is known for its forward movement of nationwide EHR systems. South Korea has established a comprehensive framework to promote health information technology.

United Kingdom: This country is identified as one of several countries that have also placed themselves at the forefront of EHR implementation, and this fact is also attributed to a publicly funded healthcare system conducive to creating health IT systems.

These nations represent notable examples in terms of successful approaches since establishing electronic health record systems, and they can provide other countries with lessons learned and best practices.

AI in Healthcare

This study points out that integrating artificial intelligence (AI) into healthcare is a potentially efficient and beneficial innovation. It sees the key challenges to adoption are users' poor understanding of AI and fears about their own jobs. Many healthcare workers are anxious that AI could take away their jobs and then the study expects that maybe AI would be designed to disrupt human intelligence itself. It is intended rather as an extension of, and assistance to, the human intellect. (Modiba, 2022).

The study argues that, to assuage such worries, targeted training workshops and research is necessary to make healthcare staff more familiar with AI systems and gain confidence in them; thus, gradually moving toward widespread adoption. It also proposes a model based on user perceptions of AI and how these translate into actual behavior. This model draws attention to the necessity of thorough staff training, proper equipment and a culture suitable for AI adoption. It says that employees will welcome integration if they think it works well and is advantageous.

The research suggests that dispelling users' fears about AI as well as giving them the necessary skills are essential if this technology is to prove herald for modern-day healthcare services at all and with a minimum of fuss.

AI (Artificial Intelligence) is quickly becoming a useful tool in the field of healthcare, being used to analyze vast amounts of patient data. AI utilizes machine learning (ML) and natural language processing (NLP) to understand the different aspects of medical data, such as medical images, lab results, and clinical notes, for diagnosis of diseases, prognosis or prediction of outcomes and treatment plans customization.

AI can, for instance, diagnose diseases such as cancer or heart issues by examining medical images with a much better degree of accuracy compared to human clinicians. AI can also help predict who is at risk to develop complications, allowing for early monitoring and management of chronic diseases. These AI-driven systems can automate administrative work associated with things like scheduling appointments, processing billing, and managing records, which improves operational efficiency.

Challenges in the Path of AI Integration in Healthcare

Data security and privacy: One of the main challenges is ensuring sensitive patient data is kept confidential and secure. That private medical data is sensitive and legally protected, requiring strict security controls and data governance process to ensure patient data privacy. (Devi, 2023)

Ethical Issues: Potential biases in training data can lead to unfair treatment outcomes, which are ethical concerns in AI-based healthcare. Moreover, the implications of AI on doctor-patient interaction concern trust in and dependence on technology for important health choices.

Collaboration Required: When integrating AI into healthcare systems, collaboration between multiple stakeholders, such as healthcare providers, data scientists, and tech individuals, is necessary. This partnership is necessary to solve potential technical, ethical, and regulatory challenges that can occur in the course of implementation.

Training and Familiarization: AI technologies require healthcare practitioners to be properly trained on these technologies to properly implement and use them. This could potentially lead to replacing existing medical knowledge if AI is not well understood and trained and consequently has far-reaching implications on patient care.

Integration with Existing Systems: Integration of AI systems into existing healthcare systems and work processes presents challenges in terms of data flow and interoperability. A considerable amount of work is needed to make AI technologies fit with current clinical workflows.

Data quality and availability: AI models depend on huge volumes of top-notch data for training. However, comprehensive and unbiased datasets may pose a major challenge, because many currently existing datasets can be incomplete or biased, which has a direct impact on the performance of AI systems.

Regulatory Challenges: The regulatory environment presents another hurdle; as healthcare regulations can differ vastly across regions. This makes the deployment of AI systems which comply with these regulations more complex, yet still effective.

These obstacles make clear the multifaceted nature of the process of implementing AI in healthcare systems and the coordinated action needed to break through them, harnessing AI in the service of patients. (Devi, 2023).

Digital records and AI combined provide a multitude of benefits

Optimized Patient Care: It enables healthcare providers create more accurate diagnosis, detect risks faster and personalize the treatment plans as per the individual's requirements leading to better health outcomes.

Effectiveness: Electronic records simplify administration, minimize paper work and enable faster access to patient information. AI can help automate menial tasks so healthcare practitioners have more time to do the work AI cannot, ultimately reducing mistakes human make and making it a faster process.

Save time and Bring cost down: benefits to reduce paper storage and decrease in undiagnostic error s and improved treatment plan helps in long term cost savings.

While there are several advantages, here are some of the challenges to drive digital records and AI implementation right in healthcare.

Data Privacy and Security: As the move to digital records reaches an all-time high as well as with an increasing use of AI, patient data security is at an all-time high in being a top priority. Healthcare is one such industry in which highly sensitive medical information is the constant subject of breaches and so across the board adherence to regulations such as HIPAA (Health Insurance Portability and Accountability Act) is mandatory to protect data privacy.

Integration Issues: The majority of healthcare organizations are still using legacy systems which may not be compatible with the latest AI tools and digital record systems. The integration of these systems may be expensive and difficult to achieve but come with their own benefits.

Bias and Fairness: One of the major challenges with AI systems is that they form decisions based on data, so if that data was incomplete or biased then the results will be just as skewed. If, for instance, a particular demographic is underrepresented in the training data, then the AI model may be less effective at providing insights for that group — which would mean unequal care can ensue.

Training and Adoption: Healthcare providers need to be trained on how to use these new technologies effectively. Staff that may be skeptical of or simply unfamiliar with AI and digital records could also pose obstacles to implementing any such work.

With the development of modern AI and digital record keeping, this area is further expanding. Innovations might be expected in areas related to telemedicine, precision medicine, and drug discovery. This is where AI should be employed in remote patient monitoring to better manage chronic diseases. Furthermore, more advanced systems are expected to yield more accurate diagnoses, individually tailored treatment plans, and reduced recovery times for patients.

In the end, the adoption of electronic records and AI in healthcare may lead to a sea change in the delivery of care, operational efficiency, and cost savings. But to fully realize the potential of these technologies, we have to get over hurdles like data security, system integration, and bias. Proper planning and ongoing advancement promise to be on the forefront of healthcare in the future, with digital records continuing to evolve and AI reducing human error.

METHODOLOGY

The findings of this paper focus on the benefits and challenge of artificial intelligence and electronic record in healthcare sector. To search the result of this paper, qualitative method had used to get the report for the research objective. Data was collected from three primary journal databases, which are Emerald Insight, Scopus and Google Scholar. Emerald Insight is a high quality and impactful journal, book and case studies for open access to all global audience. Emerald Insight database shows that there have more than

7000 number of article publications can be find related to the field. Scopus also known as Scholar Index Journal have same functions as Emerald. In the Scopus journal, the result that appear by searching TITLE-ABS-KEY (Artificial Intelligence, Record management and Digital Record) had shown only 29 articles published. It is a small number of publishing article can be found in Scopus database. Google Scholar leads the number of article publishing compared to Emerald Insight and Scopus. In Google Scholar, the result of article or journal publishing related to oral history is more than 31 000 article or journal. Usually, Google scholar is most friendly database for global audience.

Table 1: Article from search result

NO.	DATABASES	NO. OF ARTICLE
01	EMERALD INSIGHT	< 2,000
02	SCOPUS	29
03	GOOGLE SCHOLAR	< 31,000

Table 2: Screening

CRITERIA	ELIGIBILITY	EXCLUSION
Literature Type	Journal (Research Article)	Conference Paper, Book Chapter, Case Studies
Language	English	Non-English
Year Duration	Between 2015- 2024	>2015
Indexes	Artificial Intelligence, Record Management, Digital Record	Non-Artificial Intelligence, Record Management, Digital Record
Country	Asian, American, Europe	Other than these three country and territories

DISCUSSION

AI and electronic records can be very beneficial to the healthcare sector, yet both have several disadvantages. EHRs facilitate handling and retrieval of data on patients more easily, minimizing errors and improving information exchange. AI enhances the accuracy of diagnosis and prognosis of diseases, hence early detection and appropriate treatment according to individual needs.

From an operational point of view, AI could simplify processes such as invoicing and scheduling, in this way allowing healthcare workers to pay more attention to the patients while reducing costs. However, because sensitive health information may be susceptible to cyber assaults, these developments raise questions about data security and privacy. Following data protection laws and putting strong cybersecurity safeguards in place are crucial.

Furthermore, for these technologies to succeed, healthcare workers have to be trained to adapt to the new systems, or else they can oppose changes. Explicit ethical rules are also necessitated by ethical issues that come into play, such as algorithmic bias and possible over-reliance on AI. AI and electronic records hold a great promise for the healthcare industry, but their successful application requires thorough preparation and ethical consideration.

RECOMMENDATIONS

This article provides a basic review of EDRMS and AI in healthcare, establishing a strong foundation; however, there is still great potential for further in-depth and focused research on EDRMS and AI in the healthcare sector. Dynamic technological advancement, along with the increased complexity of healthcare information, calls for further investigation on a number of grounds:

- i. AI and EDRMS are rapidly evolving domains, characterized by recent innovations in machine learning, data security, and data management protocols. Subsequent studies may investigate recent breakthroughs in artificial intelligence, like natural language processing (NLP) and predictive analytics, which may improve record management and patient care.
- ii. Research may investigate the interactions between healthcare practitioners and these platforms, pinpointing obstacles to adoption and methods for enhancing user experience.
- iii. Addresses regulatory and security problems; nevertheless, more research would benefit from a thorough examination of legal, ethical, and policy ramifications. The safety of healthcare data is essential due to the increasing significance of cybersecurity threats.
- iv. Future research may evaluate the efficacy of EDRMS and AI applications across various nations or healthcare systems. Through the examination of optimal practices and obstacles across different environments, researchers may provide practical recommendations for the adaptation of technology in varied healthcare contexts.
- v. Extending this study to examine quantifiable effects of EDRMS and AI on patient outcomes, healthcare efficiency, and cost reduction will enhance its usefulness considerably. Such research may include controlled trials or longitudinal studies to ascertain evidence-based advantages.

CONCLUSION

Artificial intelligence and electronic records have the potential to significantly enhance patient care, streamline administrative procedures, and help doctors make data-driven choices. Electronic records enhance the organization and accessibility of information, resulting in increased accuracy, whereas artificial intelligence assists in predicting health trends and customizing treatments to address specific individual requirements. However, to ensure the success of these breakthroughs, it is imperative to address crucial concerns, such as the protection of patient privacy, the mitigation of cyber risks, and the training of healthcare professionals to proficiently use these new technologies. Through meticulous planning and adherence to ethical standards, these innovations may enhance the efficiency and responsiveness of the healthcare system.

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