International Journal of Science and Research (IJSR)
ISSN: 2319-7064
SJIF (2022): 7.942

Security and Compliance in Healthcare Analytics using AI

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Abstract: ***Research has promoted the application of artificial intelligence to enhance security as well as compliance within the healthcare industry. The study has shown changes in the data pattern that healthcare organisations have been optimising to manage data and makes it an effective process to analyse patient data. This strategy can be useful to acknowledge that privacy and relevant regulations have been complied with in healthcare organisations. The study has shed light on some of the common problems of transformation that have been faced by healthcare organisations including human mistakes, financial vulnerabilities and difficulties in decision making. This study has highlighted the importance of artificial intelligence to determine patient data, make correct decisions and align with compliance in order to generate effective results for the patients. The usage of natural language processing, predictive analytics, and electronic health records through the application of artificial intelligence technologies has ensured improvement in data privacy and offers customised patients in professional healthcare. The optimisation of chatbots and robotics in healthcare has made it easier to provide personalised solutions as well as patient treatment by analysing collected information.***

Keywords: Artificial Intelligence, Compliance in Healthcare Standards, Security in Patient Data, Robotics and Chatbots

1. Introduction

In the realm of health care, compliance and security should be integrated to provide efficient healthcare to the patients as well as meet industrial standards. The most necessary factor of regulatory compliance strategy and patient safety is documentation. The artificial intelligence has been playing a critical role in healthcare organisations to enhance the efficiency in data management, control and security [1]. It assists them to ensure the achievement of compliance goals and the privacy of patient data. The application of artificial intelligence helps to collect and analyse a large amount of data that can remain connected with the legal regulations. In this research, detailed knowledge will be gathered on the impact of artificial intelligence in affecting the healthcare industry and improving its security and compliance practices. Positive integration of artificial intelligence in organisations can help to promote compliance tasks, assist organisations to gain knowledge on potential risks and maintain constant alignment with the changes in compliance regulations [2]. It assists healthcare organisations to make better strategic planning for necessary resources to be allocated and ensures that further focus can be applied to the areas that need further attention in order to offer quality results. Artificial intelligence enhances the security of patient information and helps in detecting threats so that relevant measures can be taken to prevent their implementation. The report shows the global market opportunity expected to reach $28 billion yearly by 2025 for artificial intelligence applications in healthcare reflecting the significance of AI utilities in healthcare information analysis [3]. For its efficient relevance in enhancing safety, enforcement of rules and the achievement of better patient results, it has become an essential element in the modern healthcare sector.

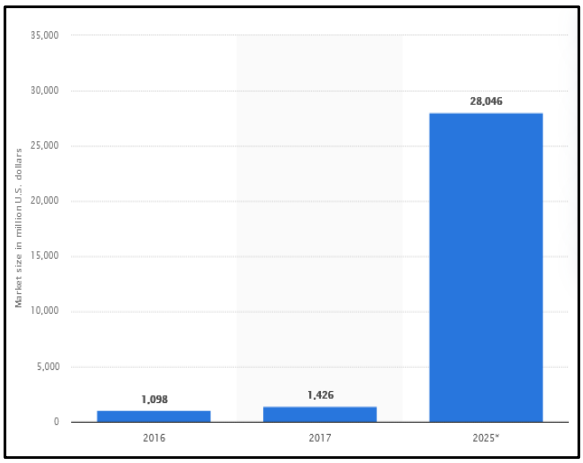

Figure 1: Global Market Size of Artificial Intelligence in Healthcare by 2025 [3]

2. Solution

The application of artificial intelligence in healthcare is linked with the reduction in the issues present in conventional analytics techniques. The systems of traditional healthcare have been facing issues of outdated information which causes a reduction in the efficiency of decisions as the information is not connected with the current information. This issue leads to making poor assumptions which do not imply to the current trends and creates inefficiency in patient care and strategic development. Adoption of compliance activities can create several complications in organisations as there is no option to choose from updated legal procedures. The challenge of large data management processes is also present which can be complex for healthcare professionals to identify and mitigate present barriers towards fostering organisational growth. Therefore, the older healthcare systems hold a minimum or no privacy practices such as firewalls and passwords to access to the system which makes them insecure towards hacking and malware attacks. Challenges in compliance have been also faced by healthcare organisations due to not having proper updates on compliance and legal risks. The issue of

human errors and high time consumption are vital gaps in traditional healthcare analytics. For this reason, the adoption of artificial intelligence has effectively evolved healthcare analytics practices in the sector as it holds the ability to mitigate the barriers. Artificial intelligence can assist in utilising the capabilities to identify data patterns and enable data processes to conduct predictive analytics and enhance patient care [5]. It possesses the benefits to create advantages such as automated diagnosis, personalised medicines and predictive analytics to enhance its operational effectiveness.

3. Application of the Solution

Artificial intelligence can efficiently improve healthcare analytics to conduct predictive analysis to understand possible patient outcomes, progress in medication and present complications. This method helps professionals to take necessary actions to mitigate risks with the alignment of compliances. The system can analyse a large amount of data and suggest actions based on patterns that may not be evolved by current practices. AI can include personalised medicine treatments for each patient by considering their requirements, health condition and past medical history. Usage of artificial intelligence has helped healthcare professionals to utilise different tools to diagnose diseases with the help of early signs. Google Deepmind Health utilise AI to analyse retinal scans and other medical images to help doctors to diagnose eye disease and breast cancer in their early stages [6]. Along with that, Zebra Medical Vision uses the technology to analyse medical images and identify bone health, lung cancer and liver diseases. Artificial intelligence can help professionals to manage electronic health records to lower human errors and automate data entry practices. It improves the discovery of new medicines and vaccinations by proposing the results of chemical reactions and their results on the patients. In modern healthcare, virtual assistants and chatbots are widely used in the telemedicine sector. For instance, Babylon Health provides its patients with AI chatbots to provide initial consultancy based on their past medical history and data patterns [7]. It allows them to schedule appointments and provide medical suggestions at their homes. Artificial intelligence has positively transformed medical imaging for professionals. It has been used to determine the accuracy of xrays, computed tomography scans and magnetic resonance imaging easily. AI tools also helps professionals to ensure constant monitor of patients suffering from chronic diseases by offering them real-time alerts and customised suggestions based on their unique health conditions. Therefore, it can be ascertained that the technology can improve the aspect of healthcare analytics to mitigate the issues faced by traditional healthcare systems.

4. Benefits of the solution

Artificial intelligence has transformed the patient care through better diagnosis, accurate decisions and the privacy of their confidential information. The algorithms can effectively analyse a large amount of information to identify potential risks and generate responses. This system allows healthcare professionals to detect the presence of anomalies and avoid potential harm in patient care [8]. The system can promote constant monitoring in compliance with stated regulatory standards. It can effectively reduce the presence of human errors with proper connection to relevant laws and guidelines. This compliance check helps to determine more accuracy in healthcare practices. AI tools such as natural language processing tools can assist to organise unstructured information from medical notes and research papers to observe their patterns for measuring risks [9]. Robotic process automation can accommodate control in administrative practices such as registration and scheduling of patients to reduce operational disruptions and errors. Therefore, these tools should be applied by healthcare organisations to adopt measures for mitigating risks by which patient safety can be enhanced. Artificial intelligence can positively improve data privacy for the confidential patient information. The adoption of strong encryption strategies will assist organisations to control access to the designated person and reduce leakage and unauthorised information access [10]. Improvement in the algorithms can promote smooth security application that supports prevention of cyber attacks and malware attacks. AI can be optimised to manage scalable suggestions to professionals by which they can align data with regulatory requirements. Healthcare organisations that intend to enhance their compliance practices need to use technology to follow security standards for ensuring market growth [11]. Another key benefit of artificial intelligence systems is that they can create accurate audit trails automatically. Audit trails help organisations to manage their data accessibility and conduct necessary updates to promote better audit results. Engagement of automated compliance and privacy systems can enable lower costs. AI can be adopted to lower the requirement of manual labour along with a decline in economic uncertainties due to data breaches. Therefore, it can be proposed that the implementation of artificial intelligence can improve healthcare analytics through better compliance and data security to facilitate higher operational effectiveness.

5. Conclusion

It can be concluded from the above discussion that artificial intelligence enhances security and compliance in healthcare analytics affirmatively. The implementation of AI in the sector has helped to lower human errors and economic risks through automation in compliance tasks. It allows healthcare professionals to secure and control patient data to meet stated regulatory standards effectively. The technology enables targeted risk management practices to estimate present gaps based on past data so that patient safety can be assured. Solutions obtained from artificial intelligence such as natural language processing and chatbots have evolved compliance in the sector to decline operational disruptions and administrative issues. The creation of accurate audit trials and constant compliance checks can help healthcare organisations to meet regulatory standards. It also enables better privacy practices and data integrity in patient management. Artificial intelligence holds the ability to analyse a large amount of data at a time and provide suggestions to enhance healthcare analytics. Adoption of customised medicine treatment and resource allocation can be done by technology. Similarly, electronic health records have helped to conduct accurate diagnoses while improving data privacy as well as security with the help of advanced encryption. Therefore, it can be comprehended that the allocation of artificial intelligence in

the healthcare sector has transformed healthcare analytics to gather better health outcomes for patients.

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