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Fortifying Cybersecurity Defenses Across AI-enabled Healthcare Ecosystem

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With the growing spectre of cyberthreats and healthcare worker burnout, how can AI be used to further improve the industry that is data laden and highly regulated?



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To support the ever-growing demand for healthcare services, the healthcare industry is expanding the adoption of smart technologies like artificial intelligence (AI) to speed up the delivery of patient care services. In 2021, AI in healthcare market was worth around $11 billion worldwide and is set to grow to $188 billion by 2030.

The healthcare organisations are known for their heavy reliance on data, and for a good reason. For instance, the valuable insights and patterns derived from the patients' medical information are relevant for making informed decisions regarding treatment plans. However, the healthcare systems run into challenges when the data estate becomes unmanageable – disorganised and stored in silos across fragmented systems.

It does not help that healthcare data is a prime target for cybercriminals over the world, given that it is mission critical and highly confidential in nature. Between 2020 and 2022, 26% US-based healthcare organisations faced six to ten ransomware attacks. In Singapore, the Ministry of Health revealed that the local healthcare sector faces 1.7 million attempts to bypass internet-facing firewalls per month.

With more than 30% of the world's data generated by health systems, it is challenging for healthcare staff and IT teams to keep up. Hence, physicians and nurses are under increasing pressure to ensure regulatory compliance while securely protecting patient data in all forms, on top of losing valuable time sorting through irrelevant data. This further contributed to the burnout of healthcare staff who are already spread too thin.

AI-enabled efficiencies

Healthcare organisations such as hospitals are under immense pressure and burden to allocate resources across different functions, spanning from patient care to operational management. It is no surprise that healthcare workers spend

considerable time on routine and administrative processes as part of patient records management. Yet, this is essential to do so, as a single doctor's note highlighting a drug allergy, or a previous condition is critical in determining how a clinician should proceed with the treatment plan.

However, the process of consolidating and categorising all the relevant patient data generated can prove to be onerous for healthcare workers, given the rising demand for healthcare services. This is where AI can step in to speed up and streamline the process of analysing, sorting and categorising patients' data so that information can be either archived for future reference or deleted accordingly. Integrating the use of AI tools within the hospitals' data management strategies also provides both the clinicians and administrative staff with easier access to data for practical uses, facilitating smarter and more informed decisions related to diagnosis and treatment plans.

Application of AI across healthcare system

Today, AI in healthcare encompasses a broad range of applications across various domains. In clinical settings, AI can help with diagnosis, predicting patient outcomes and tailoring treatment plans. When it comes to medical diagnostics, AI enhances the accuracy and speed of image analysis in radiology and pathology. Moreover, AI plays a crucial role in patient care through remote monitoring, telemedicine, and virtual assistance. For instance, during the pandemic, an AI bot was developed in Singapore to help doctors and telemedicine providers to prioritise urgent Covid-19 cases on home recovery. In Korea, AI-based tools have been used to enable the quick diagnosis and classification of patients.

The use of AI in data management offers exciting promises for greater collaboration across the wider healthcare ecosystem such as healthcare insurance, health tech, pharmaceutical and biotech sectors, where healthcare data is critical in their decision making. For instance, healthcare insurers can leverage AI technologies to speed up the insurance claim processes and decisions by automating the review and approval of claims. This helps to enhance operational efficiency between healthcare providers and insurers while reducing costs associated with manual processes. AI also enables the automation of data management processes, minimising human intervention. This results in operational efficiencies and help to eliminate human error in managing data and improving data compliance – which is critical for the highly regulated healthcare industry.

Improving quality of life for healthcare workers and patients

There has been an increasing focus on the high burnout rate for the healthcare industry, and creating a more sustainable workloads with the use of AI could be a vital step in preventing burnout and ensuring retention. Offloading the administrative tasks to AI systems allows doctors more time to refocus their efforts toward patient care. With positive patient experiences being key in creating positive outcomes, dedicating the extra time to them creates the best results for both provider and patient.

Medical tests and examinations can benefit from well trained, organised AI tools that can identify case similarities and treatment plans. This would save time on researching treatment options, provide data-driven insights and ensure healthcare workers have the information they need for effective treatment and patient care.

Fortifying defences against cyberthreats

As the custodians for healthcare data, healthcare industry players face significant challenges in terms of data storage, security, analysis and more. To safeguard the patients' data, healthcare organisations can adopt AI-driven autonomous data management solutions that leverage AI and ML – with automated malware scanning and near real-time anomaly detection capabilities – to augment IT staff in their day-to-day tasks and reduce the risks of data breaches.

On top of implementing robust encryption, access controls, and authentication mechanisms, training all healthcare professionals on the policies and tools related to proper information sharing, data usage and security compliance is also key in bolstering the security posture for healthcare organisations.

Responsible use of AI for the future of healthcare

AI has demonstrated its transformative impact. By enabling enhanced diagnostic accuracy, facilitating personalised treatments, and optimising operational efficiency, AI holds promise for reshaping the healthcare landscape. It pays for senior healthcare decision makers to put priority on investing in secure and responsible AI deployment to achieve efficiency and better patient outcomes. With regulatory frameworks being developed around the world and appropriate data management expertise and tools in place, healthcare organisations are on the right track to embrace a AI-driven future while meeting regulatory requirements.