Literature Review outline

Cloud Computing for building effective information system in healthcare

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Introduction

Healthcare systems worldwide have been increasingly adopting information technology to streamline processes, enhance patient care, and improve overall efficiency. Cloud computing, with its scalability, cost-effectiveness, and accessibility, has emerged as a promising technology for building effective information systems in the healthcare sector. This literature review aims to provide an overview of the key findings and trends in research related to the integration of cloud computing in healthcare information systems.

Search Strategy

A systematic approach in exploring the literature was followed with Google Scholar search engine. The keywords such as “healthcare”, “cloud computing”, “current trends” were used to find most relevant literature. As there were thousands of relevant publications, most recent publications in the current year were reviewed.

Why cloud computing in Healthcare?

The evolving landscape of healthcare IT, driven by the digitalisation of records, the demand for data sharing, and the need for cost-effective solutions, has paved the way for the adoption of cloud computing in healthcare. While challenges related to data security and interoperability persist, the benefits of data accessibility, cost savings, and innovation continue to drive healthcare organisations toward cloud-based solutions.

Benefits of Cloud Computing in Healthcare

Cloud computing in healthcare offers numerous advantages, including cost efficiency through reduced infrastructure expenses, scalability to handle changing patient

demands, enhanced accessibility and remote collaboration, improved data security and compliance measures, robust data backup and recovery solutions, remote patient monitoring capabilities, advanced analytics for informed decision-making, support for medical research and innovation, predictable cost models, reduced IT maintenance, and global reach for international collaboration. These benefits contribute to more efficient and effective patient care while ensuring data security and regulatory compliance in the healthcare sector.(Rai et al., 2022; Cresswell et al., 2022; Gupta & Singh, 2023; Paul et al., 2023)

Challenges and Concerns

However, there are challenges and considerations associated with implementing cloud computing in healthcare. Several authors (Agapito & Cannataro, 2023; Sharma et al., 2023; Bhowmik & Banerjee,2023). have studied the challenges posed by cloud computing, including data security and privacy risks, compliance with healthcare regulations, complex data ownership issues, interoperability challenges, concerns about system downtime and reliability, cost management complexities, difficulties with data portability, potential vendor lock-in, a shortage of IT expertise among healthcare professionals, ethical considerations in AI adoption, data sovereignty concerns, integration challenges with legacy systems, and the need for continuous monitoring and mitigation of these issues to ensure patient data security and regulatory compliance while having the benefits of cloud technology in healthcare delivery.

Healthcare Cloud Providers

Szigetvári, G., & Mesko, B. (2023), had reviewed the collaboration of technology giants' like Amazon, Google (and Alphabet), Microsoft, NVIDIA, IBM, Apple, and

Samsung with healthcare companies, aiming to shed light on the privacy implications and technological advantages of such partnerships. The tech companies are motivated to enter the healthcare market as patients and medical professionals increasingly turn to technology for health data access and analysis. To overcome the challenge of accessing healthcare data, tech giants are collaborating with healthcare institutions that possess this data.

Tackling the challenges

Vilakazi & Adebesin (2023) had reviewed the strategies to mitigate cybersecurity threats in health care data. Ensuring data security and privacy in healthcare cloud environments involves a combination of technical safeguards, organisational policies, and compliance with regulatory frameworks.

The National Health Service (NHS) in the United Kingdom utilises cloud services that align with the 'Government Cloud First Policy.' Public sector entities are encouraged to adhere to these Cloud Principles, which seek to find a harmonious equilibrium between swift technology deployment, associated costs and resources, and risk mitigation. Teams are empowered to influence cloud services from international or global providers, with due diligence carried out following the guidance provided by the Information Commissioner's Office (ICO, 2023) and the National Cyber Security Centre (NCSC) (Cloud Security Guidance, 2018).

Future of computing in healthcare

Ur Rasool et al. (2023) had explored the emerging field of quantum computing and its impact on healthcare. Quantum computing enhances healthcare by focusing on

areas like drug discovery, personalised medicine, DNA sequencing, medical imaging, and operational optimisation.

Conclusion

Overall, cloud computing will continue to transform healthcare by providing the quickness, scalability, and innovation needed to address current and future healthcare challenges while improving patient care and outcomes. However, healthcare organisations must remain vigilant in addressing security and privacy concerns and staying compliant with evolving regulations.

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