Chapter 3
Healing with Algorithms: Artificial Intelligence's Vital Role in Modern Healthcare

Hasini Balage
https://orcid.org/0009-0008-7924-082X
Southern Cross University, Australia

Darshana Sedera
Southern Cross University, Australia

ABSTRACT

Artificial intelligence (AI) integration in healthcare marks a transformative shift that enhances knowledge management processes in training, decision-making, compliance, and patient care. This study examines how AI supports knowledge creation, storage, retrieval, transfer, and application, drawing on real-world case studies from diverse healthcare organisations. AI reduces administrative burdens through automation and enables new insights via advanced pattern recognition. It also improves data accessibility and decision-making by managing structured and unstructured information. Furthermore, AI promotes equitable healthcare delivery by expanding access and offering 24/7 support. . These advancements are achieved in collaboration with traditional methods, reinforcing a co-existent model of technology adoption. The findings offer practical insights for researchers and practitioners aiming to leverage AI in healthcare and lay the groundwork for further empirical research through interviews and content analysis.

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INTRODUCTION

Imagine a healthcare system unburdened by manual administrative work that causes burnout in doctors and allows them to focus solely on patient care. Medical professionals are frequently overworked (Lai et al., 2021) and experience burnout due to administrative work, which prevents them from focusing more on patients (Microsoft, 2023a). Family physicians, for example, spend over 17 hours per week on administrative tasks, illustrating the extent of this issue (Amazon Web Services Inc, 2024b). Artificial Intelligence (AI), originating in 1956 (McCarthy et al., 2006), has experienced remarkable growth, becoming a prevalent topic of discussion across diverse fields (Balage & Sedera, 2024; Harfouche et al., 2022; Iaia et al., 2024; Lee et al., 2023; Loureiro et al., 2021). Organisations are increasingly adopting or exploring AI applications in recent years, and it is expected to transform businesses in the context of innovation and competition within Industry 4.0 (Ardito et al., 2022; Lee et al., 2023; Polireddi, 2024; Sharma et al., 2023).

AI, a branch of computing (Mao et al., 2016; Sharma et al., 2023), has evolved from being primarily used by a select group of experts, typically tech-savvy individuals, to being accessible and utilised by non-technical people for both personal and organisational purposes (McKinsey Global Institute, 2017). By leveraging AI, organisations can significantly enhance decision-making processes (Mathew & Salim, 2023), analysing extensive datasets to uncover insights that were previously beyond reach (Tshitoyan et al., 2019). This widespread adoption is particularly evident in the healthcare sector, where AI is utilised for tasks ranging from administrative work (Microsoft, 2022b) to expanding access to mental healthcare (Ghargi, 2024), impacting public health strategies, and altering the roles of both healthcare providers and patients (Hoffman et al., 2025).

AI accessibility and affordability have significantly increased over the recent years. The accessibility of AI for non-technical employees is known as the 'democratisation of AI' (Wilson & Daugherty, 2018). This transition allows small companies to apply AI, which was previously limited to large companies. Presently, companies are focusing on AI developments specific to industries, while others are working on simplifying tools to enable the integration of external AI platforms. The democratisation of AI has resulted in a boost to employees' capabilities and efficiency. Technical giants like Google and Microsoft are focusing on affordable and accessible AI models (Wilson & Daugherty, 2018). The growing number of companies providing AI services has increased competition, leading to lower prices of AI and making AI more affordable for businesses (Crawford et al., 2024). The assertion that the application of AI in healthcare has the potential to save the United States USD 150 billion by 2026 underscores the significant financial advantages anticipated for the industry. This projection highlights the capacity of AI to drive economic efficiencies within