

Chapter 5

Perception, Trust, and Accountability Affecting Acceptance of Artificial Intelligence: From Research to Clinician Viewpoint

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ABSTRACT

Artificial intelligence (AI) is intended to help clinicians exercise their professional judgment in making appropriate decisions for a given patient. Recently, research has exhibited the phenomenal performance of AI in healthcare, portraying the technology as an effective and efficient assistant. However, the acceptance and use of AI in healthcare are very limited. It is essential to understand that the overall skepticism against AI arises due to multiple factors and should be addressed as a systems problem. This chapter focuses on three major determinants of AI acceptance in healthcare: clinicians' perception, trust, and accountability. According to this chapter, moving forward, research should view AI as a socio-technical system and emphasize its ecological validity. Researchers should consider users' needs, capabilities, and interactions with other work system elements to ensure AI's positive impact in transforming healthcare.

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INTRODUCTION

The healthcare industry is one of the most overburdened systems that mandate continuous, multidisciplinary, and collaborative interaction among its stakeholders. The goal of a healthcare system is to ensure patient safety by preventing, curing, and mitigating the physical and psychological ailments of patients without discrimination. However, due to the uncertainty and limited resources (understaffed), physicians often face challenges in making timely interventions and clinical decisions. Given the ever-increasing phenotype of diseases, mutations, viruses, and infections, physicians are often confronted with a medical situation that is either beyond the scope of their primary expertise or in quantities that it becomes difficult for them to process on time. Consecutively, the increasing burden of clinical documentation, inefficient technology (Arndt et al., 2017; Maly et al., 1997; Toseland et al., 1996), and shortage of physicians also add to the overall clinical workload (Choudhury, 2022b).

Additionally, different patients have unique healthcare needs, which adds to the clinical workload and complexity. For example, pediatric patients are typically at an increased risk of fatal decompensation and are sensitive to medications. That being said, any delay in treatment or minor errors in medication dosage can overcomplicate their health. Under such an environment, physicians are expected to quickly and effectively comprehend large volumes of medical information, diagnose, and develop a treatment plan for their patients (Choudhury & Urena, 2022). Similarly, assessing geriatric patients (older patients) is also challenging, time-consuming, and often requires a multidisciplinary approach (Choudhury et al., 2020). They are prone to psychological deterioration (Enshaeifar et al., 2019) during their hospital stay, even if they recover from the primary chief of concern for the admission (Covinsky et al., 2011). As a result, physicians resort to boundedly rational and, sometimes, incorrect diagnoses, treatments, and other clinical decisions (Choudhury, 2022b).

Given the complexity and workload, the healthcare industry is a good domain that can leverage the benefits of artificial intelligence, an intelligent technology. Ideally, the computational capabilities of AI can augment care delivery and quality by assisting physicians in making well-informed clinical decisions and preventative interventions. However, there is a lack of AI acceptance in the healthcare domain, which keeps physicians benefiting from this technology. This book chapter is dedicated to identifying and discussing critical factors impeding AI acceptance and are not yet well-established in the healthcare literature from a human factor viewpoint. It emphasizes factors such as Perception, Trust, and Accountability that influence acceptance of AI in healthcare, guided by two independent case studies. The chapter will benefit researchers, policymakers, as well as interested organizations.

What is Healthcare Artificial Intelligence?

AI systems currently discussed in the literature and used by the healthcare industry are decision support systems that provide physicians with a ‘second opinion’ and, in the process, supplement their clinical judgment (Choudhury, 2022a). The nature of AI is such that different researchers and organizations have developed their respective operational definitions of this technology. For instance, the department of defense (DoD) defines AI as any technology that can perform a task that requires human intelligence. Others refer to AI as any device or application that uses data to evaluate real-time scenarios and provide recommendations. These definitions are very general and can be related to most of the devices in this

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