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Chapter Author(s): Susan Feng Lu

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Additional Comments

Comment on Chapters 1 and 2

Susan Feng Lu

Building Physician Trust in Artificial Intelligence

In the field of healthcare, artificial intelligence (AI) plays a pivotal role, offering two distinct functions that significantly contribute to its progress. First, AI demonstrates its exceptional ability to expedite routine tasks, thereby enhancing the efficiency of clinical operations and leading to substantial reductions in administrative costs. Notably, AI's proficiency in analyzing medical images, comparable to that of radiologists, and its seamless facilitation of medical information during patient transfers exemplify its capacity in this regard (Sahni et al. 2022). Second, AI empowers clinicians with invaluable clinical analytics, enabling them to provide comprehensive recommendations for diagnoses and treatments. A notable example includes AI's role in assisting patients in selecting appropriate physicians while simultaneously offering physicians well-informed treatment plan recommendations. Amid the brevity of this discourse, my focus shall be directed toward a specific yet burgeoning domain closely associated with the second function: the establishment of trust between physicians and AI.

To optimize the effectiveness of AI in clinical recommendations and foster a harmonious collaboration between AI systems and healthcare professionals, it is crucial to understand the intricate dynamics that unfold between AI

Susan Feng Lu is the Gerald Lyles Rising Star Professor of Management at the Mitchell E. Daniels, Jr. School of Business, Purdue University.

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and physicians. In this pursuit of synergy, cultivating physician confidence in AI assumes paramount significance. The ensuing discussion delves into three key aspects that hold relevance in this matter.

The first aspect to be addressed pertains to the inherent inclination of individuals to be averse to unsolicited suggestions and to harbor negative sentiments toward opinions that diverge from their own. Within the realm of clinical operations, a multitude of applications integrating AI to generate medical recommendations are seamlessly incorporated into electronic medical record systems. Consequently, AI-generated recommendations manifest automatically on physicians' screens. However, insights derived from interviews conducted in collaboration with a renowned AI-health company illuminate that a notable proportion of physicians utilizing such systems often express annoyance toward AI-generated recommendations and seek methods to disable them. In response to these concerns, the company has implemented a feature that grants physicians the autonomy to determine whether to access AI-generated recommendations.

Background data supports the notion that the acceptance rate for AI-generated recommendations is substantially higher when physicians actively choose to enable this functionality. When physicians possess unwavering confidence in their medical judgment, AI-generated recommendations may be perceived as inconsequential or even detrimental to their expertise. However, in situations involving diagnostic or treatment complexities, where seeking a second opinion or engaging in discussions with fellow medical professionals becomes necessary, AI emerges as a valuable alternative for consultation. In such scenarios, physicians welcome AI-generated recommendations and are more inclined to accept them. Thus, affording physicians the freedom to decide whether to seek opinions from AI can significantly alleviate tension between physicians and AI, while concurrently fostering trust in AI among physicians.

The second aspect to consider revolves around the diverse range of personalities exhibited by individuals. While some individuals exhibit strong opinions, others tend to be more agreeable in nature. Recognizing and adapting to these different personality types can profoundly enhance the efficiency of communication. Remarkable progress in the fields of psychology and natural language processing (NLP) has paved the way for training AI systems to communicate ideas in diverse manners. Our research endeavors encompassed an investigation into the influence of physicians' personality traits on their medical practices and clinical performance (Ding, Lu, and Kannan 2022). Through the application of NLP methods, we successfully identified physicians' personality traits and validated these measures using clinical data. By incorporating users' personality traits into the AI algorithm, we can substantially enhance the efficiency and effectiveness of communication between physicians and AI. Consequently, AI-generated recommendations

become more readily accepted by physicians, further reinforcing their trust in AI.

The third pivotal aspect crucial to instilling confidence in AI among physicians centers on accuracy. A noteworthy example that has garnered attention pertains to the emergence of ChatGPT, a question-answering bot developed by OpenAI, which has gained popularity. However, it encountered resistance within certain communities due to its proclivity for providing incorrect answers at a high frequency, leading to the temporary ban of ChatGPT on platforms like Stack Overflow (Vigliarolo 2022). While ChatGPT boasts the capability to engage in human-like conversations, one of the primary challenges faced by such communication bots lies in coding issues that contribute to inaccuracies in answering questions. It becomes evident that accuracy serves as the cornerstone for physicians to place their trust in AI systems. By prioritizing and ensuring the utmost accuracy in AI-generated recommendations, we can instill greater confidence in physicians and solidify their reliance on AI as a valuable tool in healthcare decision making.

Furthermore, alongside coding challenges, the effective management of data emerges as another critical factor influencing the accuracy of AI-generated recommendations. As underscored in the works of Dranove and Gaithwaite (2022) and Sahni et al. (2022), access to clean and dependable data assumes paramount importance when training AI systems. The presence of practice variations within healthcare settings can potentially impede the learning process of AI algorithms and hinder their ability to pass external validation.

In conclusion, the potential of clinical analytics to empower physicians with accurate diagnoses and appropriate treatment plans is significant, but it faces challenges akin to those encountered in insurers' utilization review processes. Overcoming these challenges requires addressing coding issues, effectively managing data, and accounting for practice variations, all of which contribute to reinforcing trust and acceptance of AI-generated recommendations among physicians. As Dranove and Garthwaite (2022) aptly stated, "This creates a tension: Is it better to force potentially biased physicians to conform to norms, or allow them to make their own decisions, factoring in idiosyncrasies? . . . AI does not eliminate this tension, but it may tilt the calculus."

Looking ahead, it is essential to prioritize research that addresses critical questions in the pursuit of establishing and strengthening physician trust in AI. Some of these pressing research questions include:

1. How can AI effectively deliver information to physicians? Understanding the mechanisms through which AI systems relay information to physicians is crucial for optimizing their acceptance and integration into clinical workflows. Investigating user-friendly interfaces, tailored communication

methods, and the appropriate timing of AI recommendations are areas that warrant further exploration.

2. What is the impact of incorporating AI recommendations on health outcomes? Evaluating the tangible impact of integrating AI-generated recommendations into clinical decision-making processes is paramount. Examining improvements in accuracy, timeliness, cost-effectiveness, and other aspects of patient outcomes can provide critical evidence to further validate the value of AI in healthcare.

3. Why do we need physicians if AI systems have the potential to make superior clinical decisions? Understanding the unique and irreplaceable role of physicians in the healthcare ecosystem, even in the presence of advanced AI systems, is vital. Uncovering the complementary nature of physician expertise, patient interaction, and ethical decision making alongside AI support is essential for building trust and establishing appropriate roles for both physicians and AI.

4. What incentives exist for physicians to develop trust in AI? Identifying the factors that motivate physicians to embrace and trust AI as a valuable tool is crucial. Exploring aspects such as improved clinical outcomes, enhanced efficiency, reduced workload, and opportunities for professional development can shed light on the motivational factors that drive physician acceptance and adoption of AI in their practice.

By addressing these research questions, we can gain valuable insights that guide the development of effective strategies and policies aimed at building and nurturing physician trust in AI. Ultimately, this will foster a harmonious collaboration between human expertise and technological advancements in healthcare.

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