

# 基于TAM-TOE-DOI整合框架的人工智能在药学领域应用的激励和约束因素及优化策略研究<sup>△</sup>

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**摘要** 目的 识别药学领域人工智能应用的激励和约束因素, 促进人工智能在药学领域的应用。方法 基于技术接受模型(TAM)、技术-组织-环境(TOE)框架和创新扩散理论(DOI), 采用“理论回顾→维度映射→机制整合→命题提出”的4阶段研究流程构建TAM-TOE-DOI整合框架。结合上述3种理论在药学领域人工智能应用分析的作用路径, 以及TAM-TOE-DOI的整合机制与核心命题, 采用文献综述和演绎推理的方法, 从微观(TAM)、中观(TOE)、宏观(DOI)3个层面, 系统识别药学领域人工智能应用的激励和约束因素, 并提出优化策略。**结果与结论** 在微观层面, 人工智能技术带来的效率变革与质量提升是感知有用性的主要激励因素; 技术复杂性与算法不透明是感知易用性的主要约束因素。在中观层面, 技术基础设施完善程度、高层支持力度与创新氛围, 以及外部制度压力与竞争驱动是核心激励因素; 组织资源匮乏与人才短缺是主要约束因素。在宏观层面, 相对优势、可观察性是典型的激励因素, 而技术复杂性是典型的约束因素。中国卫生行政和医保等相关部门需在宏观、中观和微观3个层面协同推进药学领域人工智能应用——在微观层面优化人机交互与分层培训, 在中观层面强化组织支持体系与能力建设, 在宏观层面打破数据壁垒和构建社会信任, 并针对不同层级医疗机构制定差异化推进路径。

**关键词** 人工智能; 药学; 激励因素; 约束因素; 技术接受模型; 技术-组织-环境框架; 创新扩散理论

## Incentive and constraint factors and optimization strategies for artificial intelligence application in pharmacy based on TAM-TOE-DOI integrated framework

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**ABSTRACT** **OBJECTIVE** Identify the incentive and constraint factors of artificial intelligence (AI) application in the pharmaceutical field, and promote the application of AI in the field of pharmacy. **METHODS** Based on the technology acceptance model (TAM), technology-organization-environment (TOE) framework, and diffusion of innovation theory (DOI), a TAM-TOE-DOI integrated framework was constructed through a four-stage research process of “theoretical review → dimension mapping → mechanism integration → proposition development”. Combining the analytical pathways of the above three theories in AI application in pharmacy with the integration mechanisms and core propositions of the TAM-TOE-DOI, literature review and deductive reasoning were employed to systematically identify the incentive and constraint factors of AI application in pharmacy from three levels: micro (TAM), meso (TOE), and macro (DOI), and to propose optimization strategies. **RESULTS & CONCLUSIONS** At the micro level, the efficiency transformation and quality improvement brought by AI technology were the main incentive factors for perceived usefulness, while technological complexity and algorithmic opacity were the main constraint factors for perceived ease of use. At the meso level, the completeness of technological infrastructure, the strength of top management support and innovation climate, as well as external institutional pressure and competitive driving forces were the core incentive factors, whereas scarcity of organizational resources and talent shortage were the main constraint factors. At the macro level, relative advantage and observability were typical incentive factors, while technological complexity was a typical constraint

factor. China's health administration, medical insurance authorities, and other relevant departments should coordinate efforts at the macro, meso, and micro levels to advance AI application in pharmacy: optimizing human-computer interaction and implementing tiered training programs at the

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