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Artificial Intelligence and Emerging Tools for Pricing Optimization in Hotel Revenue Management: Systematic Literature Review

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Abstract

Artificial intelligence (AI) and advanced analytics are reshaping hotel revenue management (RM), with forecasting and pricing optimization as central levers of profitability. This paper presents a systematic literature review (2021-2025) of empirical research on AI and data-driven approaches in RM, conducted using the PRISMA framework and searches across Web of Science and Google Scholar. The reviewed studies show that the majority of research focuses on demand forecasting using deep learning, neural networks, and hybrid time-series models, while dynamic pricing applications remain less explored. Empirical evidence also highlights the integration of risk modeling, consumer psychology, and perceptions of price fairness, emphasizing the need to account for behavioral and ethical dimensions in pricing strategies. In parallel, scholars increasingly stress the importance of transparency and co-intelligence between algorithms and human analysts, moving beyond opaque „black box“systems toward more interpretable and trustworthy solutions. Despite these advances, evidence directly linking AI tools to hotel performance indicators such as RevPAR, ADR, or guest satisfaction is still scarce, with many studies based on simulations or single-hotel cases. Overall, the review identifies forecasting as a relatively mature field, while AI-driven pricing remains a critical research gap. These findings provide both a roadmap for future inquiry and practical guidance for hotels seeking to leverage AI responsibly in their revenue strategies.

Keywords: Dynamic Pricing, Forecasting Models, Hotel Performance, Machine Learning, Revenue Strategy