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Examining the Impact of AI-Driven Recommendation Systems on Consumer Adoption of Green Products: Evidence from Digital Retail Platforms

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Abstract: *The rapid advancement of artificial intelligence (AI) has significantly transformed digital retail environments, particularly through algorithm-driven recommendation systems that personalize consumer experience. Although these systems are primarily designed to enhance commercial outcomes, their potential to promote environmentally sustainable consumption remains underexplored. This research considers how AI-based recommendation systems influence consumers' adoption of green products on digital retail platforms. Specifically, it examines the roles of perceived usefulness, trust, environmental concern, and purchase intention in shaping sustainable buying behavior.*

A quantitative research design was implemented, and primary data were collected from 472 online shoppers in Tamil Nadu, India. Structural Equation Modeling (SEM) was used to analyze the proposed relationships and the mediating and moderating effects. The results demonstrate that exposure to AI-driven recommendations positively affects consumer attitudes towards green products and purchase intentions. Perceived usefulness and trust significantly enhanced purchase intention, and purchase intention was a strong predictor of actual green product adoption. Furthermore, attitude partially mediated the relationship between AI exposure and adoption, and environmental concern strengthened the conversion of intention into behavior.

This research contributes to the integration of technology acceptance theory with sustainable consumption research by empirically demonstrating how AI-enabled personalization can facilitate environmentally responsible purchasing behavior. These findings offer practical insights for digital retailers, platform designers, and policymakers seeking to leverage AI technology to promote sustainable consumption..

Keywords: Artificial Intelligence, Recommender Systems, Green Products, Sustainable Consumption, Purchase Intention, Environmental Concern, Technology Acceptance Model, Digital Retail

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