Evaluating the Effectiveness of Recommendation Engines on Customer Experience Across Product Categories

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ABSTRACT

Artificial intelligence (AI)-powered tools such as recommendation engines are widely used in online marketing and e-commerce; however, online retailers often deploy these tools without understanding which human factors play a role in which products and at which stage of the customer journey. Understanding the interaction between AI-powered tools and humans can help practitioners create more effective online marketing platforms and improve human interaction with e-commerce tools. This paper examines customers' reliance on recommendation engines when purchasing fashion goods, electronics, and media content such as video and music. This paper also discusses the potential for improvement in recommendation engines in online marketing and e-commerce.

KEYWORDS

AI-Powered Tools, Correlation Analysis, Customer Journey, Online Marketing, Recommendation Engine, Similarity Analysis

INTRODUCTION

Artificial intelligence (AI) was established as a field of research at a conference at Dartmouth College in 1956 (Russell & Norvig, 2016). Since then, AI has greatly impacted day-to-day activities and has become a key technology in business. Among various business fields, Verma et al. (2021) suggest that AI will continue to revolutionize the field of marketing. In fact, we observe many AI-powered tools that significantly impact customers throughout all purchase stages of their customer journeys (He & Zhang, 2023). Tools like chatbots, recommendation engines, and virtual assistance also help companies improve their brand awareness and customer relationships (Rana et al., 2022). Polisetty et al. (2023) also investigated the factors that impact a company's readiness for AI implementation.

As previous studies have shown, AI tools can increase product sales through e-commerce, and thus, firms have incentives to adopt AI tools for their business; however, the effectiveness of AI tools may depend on specific products and their corresponding categories. In particular, the current literature lacks research on how AI tools affect customers differently when purchasing products from distinctly different categories. This study fills the gap between what is known—the fact that AI tools are effective—and our expectation that the effectiveness of AI tools may depend on product categories. To understand how effective AI tools are for each product category, we conducted a survey

to examine the basic statistics and performed descriptive analysis on the collected data using machine learning techniques such as similarity analysis and correlation analysis. The study aims to identify the differences, if any, in the performance of AI tools when used for different product categories. Specifically, we evaluate the effectiveness of recommendation engines when customers purchase items from three different product categories: fashion goods, media content (such as music and videos), and consumer electronics products. We also evaluated customer perceptions when interacting with recommendation engines. This research addresses the following research questions (RQs):

RQ 1: In which product category do consumers use recommendation engines more?
RQ 2: In which product category do consumers find recommendation engines more effective?
RQ 3: How do satisfaction levels change at different stages of the customer journey for different product categories?
RQ 4: What is the area where AI recommendation engines are less effective and need human support?

The rest of this paper presents a literature review and explains the survey design. It then discusses practical insights and considerations, followed by sections on the survey results and data analysis. Finally, we conclude with a summary of this article and a plan for future research.

LITERATURE REVIEW

Recommendation Engines in Marketing

Big data combined with AI offers new opportunities for companies that take advantage of it. For example, companies can implement customer-centric marketing initiatives by analyzing and interpreting customer data (Rosário & Dias, 2023); as another example, companies can find new marketing opportunities in the metaverse as the number of users who socialize virtually (especially among Generation Z) increases (Chakraborty, Polisetty, et al., 2023). Many companies have increased sales and improved marketing processes by using AI-powered tools and software applications that use AI instead of human intervention. It is observed that deploying AI technologies has a positive relationship with user engagement and conversion (Bag et al., 2022), and AI even impacts the consumption value of over-the-top platforms (Chakraborty, Siddiqui, et al., 2023). AI has also been used to gain insights into customer purchase behavior (D'Arco et al., 2019), help customers find the products or brands they are looking for and make purchase decisions (Libai et al., 2020), and improve the quality of interactions on digital business platforms (DBPs), thereby enabling value creation and appropriation on DBPs (Rangaswamy et al., 2020).

Among the various AI-powered tools available, recommendation engines are one of the most effective tools in e-commerce to boost sales. By identifying customer preferences from their shopping behavior, recommendation engines can suggest additional items for customers to add to their shopping carts, resulting in higher average cart value and increased customer engagement with the seller (Behera et al., 2020). Recommendation engines also help businesses develop effective marketing strategies by analyzing customer search behavior (Dzyabura & Hauser, 2019). AI also makes it possible to effectively provide customized offers to customers by identifying their needs and preferences (e.g., Verma, 2014; Tripathi & Verma, 2018; Kumar et al., 2019; and Verma & Yadav, 2021).

Recommendation Engines and Product Type

Recommendation engines have become increasingly prevalent in recent years and are used for a variety of product categories, including movies, music, news, books, and general merchandise. In fact, recommendation engines benefit the retail industry (Chandrashekhara et al., 2023). They are not only utilized for tangible products such as fashion (Hurrah et al., 2023) but also pose emerging considerations in the travel product sector (Zhu et al., 2017). Other examples include recommendation

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