



Moderating Role of Perceived Staff-Replacement Likelihood on Self-Ordering Kiosk Adoption: Evidence From the Restaurant Industry

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ABSTRACT

The restaurant industry widely employs self-ordering kiosks (SOKs). However, the increased use of automation in restaurants is causing job displacement, raising concerns about the lack of sufficient human support in restaurants. The study examined variables influencing customer willingness to use SOKs while considering how staff replacement perceptions alter these effects. Partial least squares structural equation modeling reveals that performance expectancy, effort expectancy, social influence, and perceived security significantly influence behavioral intention to use SOKs, and behavioral intention strongly predicts actual kiosk usage behavior. Among the moderating effects, only perceived staff replacement likelihood significantly influences the relationship between perceived security and behavioral intention. Specifically, customers who believe SOKs are likely to replace human staff rely more heavily on the kiosk's perceived security when deciding whether to use them. Based on the findings, the study suggests effective strategies for employing SOKs to enhance customer usage.

KEYWORDS

Self-Ordering Kiosks, The Unified Theory of Acceptance and Use of Technology (UTAUT), Perceived Security, Automation, Employment

INTRODUCTION

Self-ordering kiosks (SOKs) are interactive touch-screen devices that enable customers to place orders and process payments independently in service settings (Marinakou et al., 2023). Unlike studies that focus primarily on digital payment systems or electronic transactions, this research conceptualized SOKs as automated service interfaces that reshape customer and employee interaction during the ordering process. SOKs are increasingly utilized in various industries such as retail, airports, hotels, healthcare, and food services. The global SOK market was valued at \$32.51 billion in 2024. With a projected compound annual growth rate of 6.23% from 2025 to 2033, the market is expected to expand significantly, reaching an estimated value of \$56.01 billion by the end of the forecast period (Straits Research, 2025).

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The adoption of SOKs in restaurants has progressed much faster than in other sectors (Marinakou et al., 2023). A recent study found that the global adoption of SOKs in quick-service restaurants has increased by over 18% annually in the last five years (Weny et al., 2024). The COVID-19 pandemic significantly drove the rapid expansion of SOKs, as consumers sought greater safety. SOKs present an efficient and contactless solution to traditional counter services, ensuring a safer experience while promoting social distancing.

The growth of SOKs is on the rise even in the post-pandemic landscape, because these kiosks offer significant advantages for both customers and marketers. SOKs significantly enhance the customer experience by cutting down wait times, providing seamless order customization, and ensuring greater order accuracy. Embracing this technology not only makes service faster but also puts the power of choice in the hands of the customer (Che Ishak et al., 2021). SOKs not only offer practical benefits but also provide enjoyable and engaging experiences for customers (Baba et al., 2023). They can lower labor costs by minimizing the need for frontline employees and can boost revenue through effective upselling features, such as recommending complementary or higher-value items (Lee et al., 2022). SOKs enhance customer data collection for marketers by capturing information on preferences, order history, and demographics. This data analysis helps improve service quality and supports personalized marketing campaigns.

On the other hand, as automation continues to evolve, its implications for business ethics can no longer be ignored. The widespread implementation of SOKs raises serious concerns about job displacement that must be addressed proactively. For example, the world's largest burger chain, McDonald's, began installing SOKs at most of its locations in 2020 (Herzlich, 2024). While these machines cannot entirely replace human cashiers because they do not support cash payments, McDonald's is actively deploying new SOKs that include a cash-payment option. This development allows customers to completely bypass human cashiers, raising concerns about job displacement. Additionally, customers can quickly complete and customize their orders, which leads to an increase in the volume and complexity of orders compared to traditional in-person orders (Stoffers, 2024).

Marketers must also address customers' security concerns regarding payments and personal information when using mobile platforms, because this information can sometimes be stolen by hackers and scammers (Khalilzadeh et al., 2017). As a result, customers are apprehensive about the potential risks of having their information misused, which can influence their willingness to use SOKs (Wen & Mohamed, 2022).

To address these issues, this study employs the Unified Theory of Acceptance and Use of Technology (UTAUT; Venkatesh et al., 2003) as the baseline framework to explain consumers' intentions and use of self-ordering kiosks. UTAUT specifies four main determinants—performance expectancy, effort expectancy, social influence, and facilitating conditions—that have been empirically validated across a range of technology adoption settings. Compared with its extended version, UTAUT2 (Venkatesh et al., 2012), the original model provides a more parsimonious foundation, allowing the integration of new, context-specific constructs without the confounding effects of multiple overlapping predictors.

In response to relevant consumer concerns in automated restaurants, this research extends UTAUT by using perceived security as a new antecedent of behavioral intention and perceived staff replacement likelihood as a moderating variable. Perceived security represents consumers' faith in protecting data and ensuring payment security, whereas perceived staff replacement likelihood denotes their perceptions of job displacement resulting from automation. With these constructs integrated, it is possible to gain a better understanding of both functional drivers as well as moral issues that influence consumer acceptance of self-ordering kiosks in restaurants.

This article proceeds as follows. First, prior research on self-ordering kiosks and technology acceptance models is reviewed. Next, the theoretical framework and hypotheses are developed. The methodology and results are then presented, followed by a discussion of the results and their theoretical and managerial implications, limitations, and directions for future research.

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