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Extending the Expectation Confirmation Model (ECM-IS) to Explain Continuance Intention towards Self-Service Retail Technology

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Abstract

This study develops a conceptual framework to explain continuance intention toward Self-Service Retail Technology (SSRT) by extending the Expectation Confirmation Model for Information Systems (ECM-IS). Despite increasing adoption of SSRT in retail environments, sustaining continued usage remains a major challenge. Existing studies largely focus on initial adoption, while post-usage mechanisms influencing continuance intention remain underexplored, particularly in physical retail contexts. This study proposes a conceptual framework integrating the core constructs of ECM-IS with user experience factors relevant to SSRT, namely simplicity, interactivity, and perceived enjoyment. These factors are proposed as antecedents influencing perceived usefulness and satisfaction, which subsequently determine continuance intention. The framework provides a more comprehensive understanding of post-use behavior in self-service retail technology. Theoretically, the study extends the application of ECM-IS in the retail technology context. Practically, the framework offers insights for retailers and system developers in designing user-experience-oriented SSRT strategies to encourage continued usage. This study contributes to the literature by extending the ECM-IS model through the integration of user experience dimensions tailored to capture the unique characteristics of the self-service retail environment.

Keywords: Self-Service Retail Technology, Continuance Intention, Expectation Confirmation Model, User Experience, Retail Technology

Introduction

Driven by rapid global advances in digital technology, the retail industry landscape in Malaysia has also evolved in line with these changes. This is evidenced by retailers' adoption and implementation of automation systems, which in turn can provide a different experience for customers while increasing operational efficiency (Khan et al., 2025; Shankar et al., 2021). In this regard, Self-Service Retail Technology (SSRT) has been proven capable of completing customer transactions without direct interaction with retailer staff. SSRT includes applications such as self-service kiosks, scan-and-pay systems, cashless payments and smart

carts that facilitate the purchasing process (Aguirre Reid et al., 2024; Kim et al., 2023). These technological devices not only aim to reduce waiting times and dependence on labour, but also support the needs of modern consumers who demand fast, efficient and flexible services (Fernandes & Oliveira, 2021; Roy et al., 2018).

In Malaysia, investment in SSRT is increasing, especially in urban areas such as hypermarkets and major shopping malls (Yeoh et al., 2025). To enhance the competitiveness of the country's digital economy, the use of automation and self-service technology in the retail sector is receiving increasing attention and encouragement and is fully supported by the Malaysia Digital Economy Action Plan (Ministry of Economy Malaysia, 2021; Malaysia Digital, 2024). However, the level of SSRT adoption remains uneven and is in a developmental phase, especially outside metropolitan areas (Boro & Goswami, 2022; Freeman et al., 2020). This situation suggests that users do not necessarily intend to continue using the technology, even if they have used it in the early stages. Critically, increased initial adoption of SSRT does not necessarily translate into users' continuance intention to use the technology.

The importance of studying SSRT extends beyond technological adoption, as it directly influences the sustainability of retail digitalisation initiatives and long-term organisational performance. Despite substantial investments in automation technologies, the effectiveness of SSRT implementation depends largely on users' willingness to continuously engage with the system. Without sustained usage, retailers may face underutilisation of technological infrastructure, reduced return on investment, and inefficiencies in service delivery. Therefore, understanding the factors that drive continuance intention is essential to ensure that the benefits of SSRT are fully realised in practice.

Previous studies have shown that consumers may be willing to try self-service technologies at an early stage, but they tend to revert to traditional methods when the actual usage experience does not meet expectations, interactions are perceived as complicated or concerns arise regarding transaction risks (Chai et al., 2023; Jumbri et al., 2024; Maduku & Thusi, 2023). Factors such as system errors, interface complexity, risk perception and transaction failures have also been identified as contributing to the low continuance intention towards self-service technology (Bani-Hani & Shepherd, 2021; Ferreira et al., 2023a; Zhou, 2013). This disengagement behavior creates a significant gap between initial acceptance and continued use thus, this disengagement behavior negatively affects the return on technology investment in the retail sector.

Understanding continuance intention towards SSRT is not only important from a theoretical standpoint but also offers significant practical value to multiple stakeholders. For retailers, insights from this study can assist in designing more user-friendly and efficient self-service systems that enhance customer retention and operational effectiveness. For system developers, the findings provide guidance in improving system usability and interactive features that align with user expectations. Additionally, this study benefits researchers by extending existing theoretical frameworks and offering a deeper understanding of post-adoption behaviour in emerging retail technologies.

Most studies still focus on initial acceptance factors using models such as the Technology Acceptance Model (TAM) and the Unified Theory of Technology Acceptance and Utilisation

(UTAUT), although the literature on self-service technology is growing (Tao et al., 2023; Venkatesh & Davis, 2000; Wongyai et al., 2024a). Bhattacherjee (2001) has also demonstrated that user perceptions at the initial (pre-use) stage are clearly explained by these models. In contrast, the decision to continue use is shaped by post-use evaluations involving the user's actual experience with the system. Therefore, studies focusing on continuance intentions in the context of physical retailing and post-reception mechanisms are still limited and require careful attention, especially in a developing market environment such as Malaysia.

Based on the above explanation, the Expectation Confirmation Model – Information Systems (ECM-IS) provides a strong theoretical basis for explaining continuance behavior. This continuance behavior of technology use is explained by linking the constructs of expectation confirmation, perceived usefulness, satisfaction and continuance intention. (Amiri et al., 2025; Hsiao & Tang, 2025). However, ECM-IS traditionally emphasizes cognitive evaluation and pays less attention to the experiential elements that are increasingly dominant in today's digital retail environment. In the context of interactive and user-experience-based SSRTs, factors such as system simplicity, interactivity, and perceived enjoyment have the potential to play an important role in shaping post-consumer perceptions (Aguirre Reid et al., 2024; Gagné et al., 2024).

Accordingly, this conceptual article aims to expand the application of ECM-IS by integrating the construct of user experience as an antecedent to the core constructs of the model. By placing simplicity, interactivity and perceived enjoyment as initial factors influencing perceived usefulness and satisfaction, this study aims to offer a more comprehensive framework in understanding the post-use mechanisms of SSRT and explaining the continuance intentions towards SSRT in the context of physical retailing, thus contributing to the enrichment of the literature on information systems and self-service technologies in the Malaysian retail environment.

Literature Review and Conceptual Framework

Expectation Confirmation Model – Information Systems (ECM-IS)

The Expectation Confirmation Model – Information Systems (ECM-IS) has been identified as one of the most suitable theoretical frameworks to explain users' intentions to continue using information systems, in line with the need to understand post-technology use behavior. This model was originally developed to explain how initial usage experiences influence users' decisions to continue using a system in the subsequent period after the initial trial. (Bhattacherjee, 2001). In contrast to the initial acceptance model that focuses on pre-use expectations, ECM-IS emphasizes post-use evaluations formed through a comparison between initial expectations and actual user experiences (Amiri et al., 2025; Hsiao & Tang, 2025).

In the ECM-IS framework, the main constructs involved are confirmation, perceived usefulness, satisfaction, and continuance intention. The extent to which users' real experiences meet or exceed their initial expectations for system performance is referred to as confirmation. When user expectations are confirmed, perceptions of system usability will increase and subsequently lead to the formation of satisfaction (Amiri et al., 2025; Hsiao & Tang, 2025). In the long term, satisfaction is a significant factor in ensuring continued use of

technology. This has been supported and demonstrated in previous studies across a range of contexts, including e-services, mobile applications, e-learning, and digital platforms. (Lim et al., 2021; Nikhashemi et al., 2021). In addition, ECM-IS remains relevant for explaining the mechanisms of continued use in an increasingly complex digital environment, as shown in recent studies (Sundjaja et al., 2024). Compared to early acceptance models such as TAM or UTAUT which emphasize intention before use, ECM-IS emphasizes actual experience as the basis for forming decisions to continue using the technology (Bhattacherjee, 2001). Therefore, this model is well-suited to the context of SSRT, where the main challenge is not to encourage initial trials but to ensure repeated and consistent use.

However, although ECM-IS provides a solid theoretical foundation, its application still requires adaptation to self-service retail technology (Bhattacherjee, 2001). SSRTs operate in physical retail environments that involve direct interaction between users and systems, time pressure, and more dynamic and experiential service experiences (Gagné et al., 2024; Jo, 2022). In such situations, user evaluations are not only cognitive but also influenced by experiential factors such as system ease of use, level of interactivity, and enjoyment during interaction with the technology (Lin & Hsieh, 2011). Thus, while the core constructs of ECM-IS remain relevant, it is appropriate to consider system-related and user experience-related factors as additional antecedents to provide a more comprehensive picture of the formation of continuance intentions towards SSRTs. This extension is expected to enhance the model's ability to explain consumer experience-oriented post-consumption behaviour in a retail environment that increasingly supports technological modernity. (Pagnanelli et al., 2025; Sundjaja et al., 2024).

Continuance Intention towards Self-Service Retail Technology

The concept of continuance intention refers to users' tendency to continue using a system after an initial experience, particularly in the context of information systems and digital technology. (Amiri et al., 2025; Bhattacherjee, 2001). In contrast to initial acceptance intention, continuance intention is formed based on the user's assessment of the actual experience while interacting with the technology (Hsiao & Tang, 2025; Sundjaja et al., 2024). Basically, continuance intention describes the user's decision whether to maintain repeated use of the system in the long term after the initial trial phase (Rahman et al., 2025; Sundjaja et al., 2024).

In the modern technological environment, continuance intention is considered an important sign of an information system's success (Mishra et al., 2023a). Although users may be interested in trying new technologies, the true success of a system can only be achieved when users choose to continue using it consistently in their daily activities (Dequanter et al., 2022). Seridaran et al., (2024); Akdim et al., (2022), and Mishra et al., (2023b) have agreed that the value of the system, the level of user satisfaction, and the quality of the interaction experience with the technology are factors that influence the decision to continue using the technology.

From the perspective of self-service technology, continuance intention plays a more critical role than initial acceptance intention (Ferreira et al., 2023b). This is because systems such as self-service kiosks, scan-and-pay systems, and self-purchase applications can only provide economic benefits to the organisation when used repeatedly by customers (Zhong & Moon,

2022). If consumers stop using the technology after the initial experience, retailers' technology investments may fail to deliver the expected returns. Therefore, understanding the factors that influence the intention to continue using certain technologies needs to be emphasized so that the implementation of self-service technology, especially in the retail sector, achieves the level of effectiveness at stake. (Hsiao & Tang, 2025; Amiri et al., 2025).

In addition, in an increasingly customer-experience-oriented retail environment, the decision to continue using SSRT is not only influenced by the functional benefits of the technology (Shim et al., 2020). Conversely, users also evaluate their interactions with the system by taking into account the overall experience when performing self-service transactions, as well as the system's ease of use and responsiveness. Studies related to self-service technology have also shown that positive interaction experiences can increase consumer confidence and subsequently encourage repeated use of the system (Jo, 2022).

Based on the discussion, it can be concluded that continuance intentions towards SSRT are an important indicator for evaluating the success of implementing self-service retail technology (Hsiao & Tang, 2025). Therefore, Wu et al. (2022) emphasise that understanding the mechanisms influencing the formation of continued intention is important for helping retailers design more effective technology strategies that focus on the user experience.

Simplicity and Perceived Usefulness

Building on the discussion of post-use experiences with SSRTs, system simplicity is considered an important factor influencing users' evaluation of perceived usefulness. Simplicity can be defined as the extent to which an SSRT is easy to understand and requires minimal cognitive effort during use, which is particularly important in fast-paced retail environments where users expect immediate usability without extensive learning (Gagné et al., 2024). Prior studies indicate that simple and intuitive systems improve interaction efficiency and reduce cognitive load, leading to more favourable perceptions of system usefulness (Dabholkar & Spaid, 2012; Fernandes & Oliveira, 2021). From a post-adoption perspective, characteristics experienced during actual system use play a critical role in shaping perceived usefulness (Li & Li, 2023). Empirical evidence further suggests that system simplicity enables faster task completion, reduces operational complexity, and lowers cognitive barriers. It also allows users to focus on task outcomes and enhances perceptions of efficiency in retail and mobile service contexts (Sayali Pataskar, 2025; Verkijika, 2020a). Hence, the following proposition is put forward:

P1a: Simplicity positively influences the perceived usefulness of SSRT.

Simplicity and Satisfaction

In addition to influencing perceptions of usability, simplicity also plays an important role in shaping user satisfaction with SSRTs (SELVAN PERUMAL et al., 2023). A simple and intuitive system can reduce frustration, confusion, and errors during transactions, thus improving the overall user experience (Henderson et al., 2024). An experience free of technical glitches and operational difficulties is an important factor in user satisfaction in a self-service technology environment. (Lin & Hsieh, 2011; Meuter et al., 2000). Users are more likely to rate their experience positively when using SSRTs that work and are easy to use as expected. System simplicity also reduces cognitive and emotional load during repeated interactions, which can contribute to more positive affective evaluations of the system and increase user satisfaction

(Bhattacherjee, 2001; Verkijika, 2020). Empirical studies of technology in this area also show that simple and clear system designs increase user satisfaction by enabling smoother transactions and strengthening user confidence in the technology. (Gagné et al., 2024). Hence, the following proposition is put forward:

P1b: Simplicity positively influences the satisfaction in using SSRT.

Interactivity and Perceived Usefulness

In addition to its role as a self-service medium, the interactivity of SSRTs is an important determinant of the system's effectiveness. Interactivity refers to the system's ability to provide immediate feedback, responsive navigation, and sufficient control to the user during the transaction process (Sena et al., 2025). Previous studies have shown that more interactive systems increase process clarity and help users complete tasks more efficiently, thereby increasing perceived usefulness of the technology (Nadj et al., 2020; Nikhashemi et al., 2021). From the SSRTs area, a high level of interactivity allows users to actively interact with the system, understand each step of the transaction, and correct errors immediately. This makes the transaction process more transparent and easy to handle, thus increasing the perception that the technology helps support their purchasing activities (Lee et al., 2025). Empirical studies in technology-based service environments have also shown that interactive features strengthen perceptions of usefulness by increasing system transparency and facilitating task execution (Nikhashemi et al., 2021; Pantano et al., 2022). In a self-service retail environment, responsive system feedback also increases users' confidence to complete transactions independently, thus strengthening their evaluation of the usefulness of the system's functions (Aguirre Reid et al., 2024; Gagné et al., 2024). Hence, the following proposition is put forward:

P2a: Interactivity positively influences the perceived usefulness of SSRT.

Interactivity and Satisfaction

In addition to increasing perceived usability, interactivity is also expected to directly influence user satisfaction. Responsive SSRTs that provide clear feedback can increase user engagement and reduce uncertainty during the transaction process. This smooth and effective interaction experience helps create positive emotions, thus contributing to user satisfaction with the system (Lubbe et al., 2025; Verkijika, 2020b). In a self-service retail environment, when interacting with an SSRT that is perceived as easy and responsive and provides clear feedback, users tend to rate the usage experience more positively (Murad et al., 2024). Previous studies also show that interactive system features can increase user satisfaction by increasing the sense of control over the transaction and reducing the perceived risk during system use (Lubbe et al., 2025; Meuter et al., 2000). When users feel confident navigating the system and completing transactions independently through interactive SSRTs, their overall evaluation of the service experience becomes more positive, thereby increasing user satisfaction (Othman et al., 2020). Hence, the following proposition is put forward:

P2b: Interactivity positively influences satisfaction in using SSRT.

Perceived Enjoyment and Perceived Usefulness

SSRTs in modern retail not only function as transactional tools but also offer interactive and emotional user experiences. Perceived enjoyment leads to a better experience when using such a technology system (Dabholkar & Spaid, 2012; Lin & Hsieh, 2011; Nikhashemi et al., 2021). According to Pillai et al. (2020), perceived enjoyment refers to the level of pleasure and positive experience that users experience when interacting with a system. Previous studies have shown that enjoyable user experiences can increase users' intrinsic motivation, which in turn influences how they evaluate a technology's effectiveness and usefulness (Fernandes & Oliveira, 2021; Venkatesh et al., 2012). When interactions with a system are perceived as interesting and enjoyable, users tend to rate the technology as more useful because the process of use becomes easier and less burdensome. In the context of SSRTs, enjoyable interaction experiences can increase user engagement and make the transaction process more positive and smooth (Gagné et al., 2024; Nikhashemi et al., 2021). Studies on self-service technology and digital service environments have also shown that enjoyable user experiences increase perceived usefulness by eliciting positive affective responses and enhancing user engagement during task execution (J. Li et al., 2025; Wongyai et al., 2024b). Therefore, perceived pleasure is expected to increase users' perceived usefulness of SSRT. Hence, the following proposition is put forward:

P3a: Perceived enjoyment positively influences perceived usefulness of SSRT.

Perceived Enjoyment and Satisfaction

In addition to influencing perceptions of usability, perceived enjoyment is also expected to directly influence user satisfaction. (Kowalczuk & Musial, 2024; Pang & Ruan, 2024). Enjoyment has been identified as an important factor shaping the overall evaluation of service experiences across various contexts, including self-service technology. (Wongyai et al., 2024c). When users enjoy interacting with SSRT, they tend to evaluate their experience more positively and subsequently feel more satisfied with the service. In the self-service retail environment, enjoyable usage experiences not only increase user engagement but also strengthen emotional attachment to the technology. Therefore, empirical studies by Rahman et al., (2025) and Sinha & Singh, (2023) have also shown that enjoyable system interactions increase user satisfaction by strengthening users' emotional connection to the service experience. Hence, the following proposition is put forward:

P3b: Perceived enjoyment positively influences satisfaction in using SSRT.

Perceived Usefulness and Continuance Intention

Davis et al. (1989) defined perceived usefulness as the degree to which users believe that using a technology can improve performance or effectiveness in performing a task. Therefore, perceived usefulness is an important factor influencing user decisions to continue using a system in accordance with the ECM-IS framework (Hsiao & Tang, 2025; Mishra et al., 2023b). Chelvarayan et al. (2025) have shown that consumers prefer to integrate this technology into their daily purchases when they perceive it as promising better returns, such as time savings, easier and more efficient transaction processes, and increased efficiency in purchasing activities. High perceived usefulness plays an important role in the formation of continuance intention because users evaluate SSRT as a technology that is valuable and relevant to their needs (Pagnanelli et al., 2025; Sundjaja et al., 2024). In previous studies, users were more

likely to maintain consistent use of the technology over the long term when they considered the system to be very useful for supporting their shopping activities (Magno & Cassia, 2024; Wu et al., 2024). Therefore, perceived usefulness is expected to have a positive relationship with continuance intention towards SSRT. Hence, the following proposition is put forward:

P4: Perceived usefulness positively influences continuance intention to use SSRT.

Satisfaction and Continuance Intention

By comparing initial expectations with the system's actual performance, user satisfaction can be interpreted as an overall evaluation of the SSRT usage experience (Zahari et al., 2023). Previous studies by Fernandes & Oliveira (2021); Ferreira et al. (2023) and Maduku & Thusi (2023) have proven that satisfied users tend to form positive attitudes after use, thus strengthening their intention to continue using the system. In the context of SSRT, users will be motivated to continue using the technology consistently if they derive satisfaction from a simple system and a smooth transaction experience (Xavier et al., 2023; Zaitouni & Murphy, 2025). When users feel satisfied with their previous usage experience, they are more likely to maintain their usage behaviour towards the technology. Thereby, within the ECM-IS framework, satisfaction plays an important role in shaping users' decisions to continue using the system after the initial experience (Amiri et al., 2025; Mishra et al., 2023). When satisfaction is reinforced through repeated positive interactions, users are more likely to sustain their continuance intention toward SSRT over time. Hence, the following proposition is put forward:

P5: Satisfaction positively influences continuance intention to use SSRT.

Perceived Usefulness and Satisfaction

The intention to continue using the ECM-IS mechanism is directly influenced by perceived usefulness, which at the same time also plays a role in shaping user satisfaction. (Dou et al., 2025; Sobodić et al., 2024). (Bolodeoku et al., 2022) have justified perceived usefulness as the level of user belief that a technology can improve effectiveness and facilitate the execution of a task. When users consider SSRT as a useful and effective technology in helping them achieve their purchase goals, this cognitive evaluation is subsequently translated into satisfaction with the system usage experience (Ferreira et al., 2023a). Within the operational environment of SSRT, Loan et al. (2025) assert that users' confidence in the system's ability to support their transaction activities will be more successful if they have a very high level of perceived usefulness towards the technology system. This situation contributes to a more positive assessment of the overall experience of using the technology (Siagian et al., 2022). Recent studies in digital service environments and intelligent systems have also shown that perceived usefulness functions as a key cognitive antecedent to user satisfaction by reinforcing the belief that the system provides practical value and performance benefits during repeated use (Alkhawaja et al., 2022; Maryani et al., 2025; Mishra et al., 2023b; Wilson et al., 2021). Therefore, user satisfaction with SSRT tends to improve when users perceive the technology as useful. Hence, the following proposition is put forward:

P6: Perceived usefulness positively influences satisfaction in using SSRT.

Conceptual Framework

Figure 1 illustrates the conceptual framework proposed in this study.

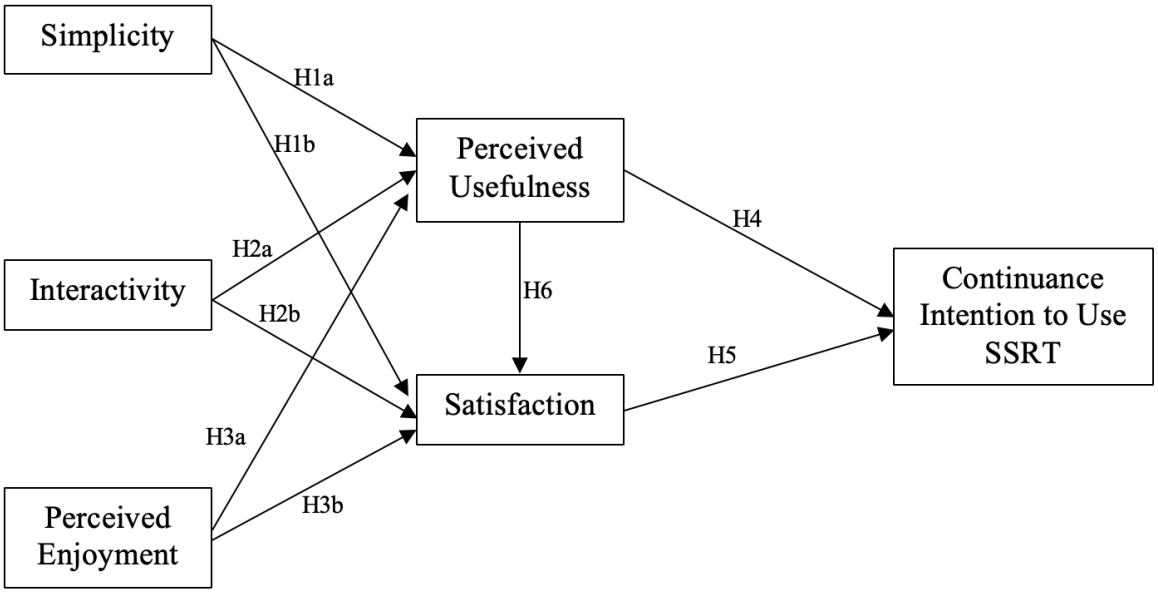

Figure 1. Extended ECM-IS Conceptual Framework For SSRT

Research Implications

Theoretical Implications

In the information systems, services marketing and consumer behaviour literature on intention to continue using Self-Service Retail Technology (SSRT), this study provides additional insight and advances current understanding by integrating technology and user experience perspectives. In contrast to previous studies that mostly focus on the initial adoption of the technology, this study emphasizes post-use mechanisms by extending the application of the Expectancy Confirmation Model – Information Systems (ECM-IS) to the context of physical retailing. By including user experience constructs such as simplicity, interactivity, and perceived enjoyment as antecedents to the core constructs of ECM-IS, this study expands the scope of the theory of continued use of information systems in the self-service technology environment. The intention to continue using SSRT is formed as a result of perceptions of usefulness and satisfaction, which are influenced by the characteristics of the user's interaction experience with the system, and this expansion helps explain that relationship.

Building on this, this study discusses users' simultaneous cognitive and affective evaluations during interactions with self-service technologies, thereby contributing to the literature. Existing literature is still limited in explaining how user interaction experiences with self-service systems influence the mechanism of continued use, especially in a retail environment characterized by time pressure and self-interaction. Therefore, the proposed conceptual framework offers a more experiential and contextual theoretical approach, thus strengthening the application of ECM-IS in modern retail technology studies.

Practical Implications

From a different perspective, retailers, system developers, and policymakers involved in planning and implementing Self-Service Retail Technology (SSRT) also benefit from this study. The success of SSRT implementation depends not only on the provision of technology alone, but also on the extent to which the system meets the needs of the user experience and is able to encourage continued use.

An SSRT system that meets users' needs and expectations is likely to sustain long-term usage and encourage continued use. Therefore, system providers who are aware of weaknesses can take prompt action so that continuance improvements can be implemented to increase user satisfaction and strengthen the intention to continue using the system. In an increasingly consumer-oriented retail market, the increasing demand for self-service services is expected to continue to drive the use of SSRT, thus affecting the operational structure and competitiveness of retailers. Therefore, retailers need to emphasize on the design of systems that are easy to use, interactive and fun to enhance the perception of usability and consumer satisfaction with the technology. At the same time, understanding the factors that influence the continued use of SSRT can help policy makers formulate guidelines and digitalization initiatives that focus more on the user experience. Overall, this study has the potential to be a strategic reference in supporting the development of digital retail in Malaysia by helping stakeholders understand consumer behavior, optimize technology investments and promote the sustainable use of SSRT in the long term.

Conclusion

This conceptual study aimed to examine the key factors influencing the intention to continue using Self-Service Retail Technology (SSRT) in the retail sector. The proposed conceptual framework, based on an extension of the Expectancy Confirmation Model – Information Systems (ECM-IS), provides a more comprehensive understanding of the SSRT's post-use mechanisms, specifically the role of user experience factors in shaping perceptions of usefulness, satisfaction and subsequent intention to continue using. By integrating experience constructs such as simplicity, interactivity and perceived enjoyment into the ECM-IS framework, this study offers a more contextual perspective in understanding the continued use behavior of self-service retail technology. Overall, the proposed framework provides a useful conceptual foundation for future research and helps retailers and system developers plan SSRT implementations with a stronger focus on user experience.

Future Research and Recommendations

Opportunities for future research arise from several limitations identified in this conceptual study. First, the proposed framework is still conceptual and has not been empirically tested. Therefore, future research is recommended to validate the relationships between the proposed constructs through a quantitative approach in a real retail context to assess the validity and applicability of the proposed model. In addition, empirical studies involving various retail locations and environments, such as urban and rural areas and across different countries, have the potential to enhance the generalizability of findings related to continued use of SSRT.

Second, future research may expand the model by including additional variables that can shape sustainability intentions towards SSRT. Although this study emphasizes user

experience factors and the main constructs of ECM-IS, these additional variables also provide valuable insights. In particular, elements such as individual characteristics, technology readiness, retail contextual conditions, and organizational support require further investigation to provide a more precise and comprehensive understanding of sustainable usage behavior in self-service technology. Such efforts are expected to contribute to the development of a more robust model and offer deeper practical insights for stakeholders in the retail sector.

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