

INVESTIGATING THE INFLUENCE OF SMART RETAIL TECHNOLOGY ON CUSTOMERS' INTENTION TO USE BASED ON THE VALUE-BASED ADOPTION MODEL APPROACH

NGHIÊN CỨU ẢNH HƯỞNG CỦA CÔNG NGHỆ BÁN LẺ THÔNG MINH ĐỐI VỚI Ý ĐỊNH SỬ DỤNG CỦA KHÁCH HÀNG DỰA TRÊN MÔ HÌNH ÁP DỤNG DỰA TRÊN GIÁ TRỊ

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Lê Thị Bích Ngọc ✉

ABSTRACT

With the advent of technologies in the digital era, the retail sector also has a transformation in the way of interacting with customers and day-to-day activities. This study thus employs the framework of the value-based adoption model to investigate the intention to use smart retail technology from the customers' value-based perspective that may be neglected in prior studies. A total of 347 survey data were collected and analyzed. By considering the customers' perception of smart retail technology in both benefits and sacrifices aspects, findings show that the customers' perceived values of smart retail technology and customers' perceived shopping value have a positive relationship with the intention to use smart retail technologies. The study also considers the moderation effect of social innovativeness on the relationship of the perceived value of smart retail technology, perceived shopping value, and intention to use SRTs, however, findings showed a non-significant effect on both relationships. This study thus has some theoretical implications and practical implications regarding smart retail technologies for both researchers and managers.

Keywords: Smart retail technology, Value-based adoption model, Perceived value, Intention to use.

TÓM TẮT

Với sự xuất hiện của công nghệ trong thời đại số, ngành bán lẻ cũng đã trải qua sự biến đổi trong cách tương tác với khách hàng và các hoạt động hàng ngày. Nghiên cứu này sử dụng mô hình áp dụng dựa trên giá trị để điều tra ý định sử dụng Công nghệ bán lẻ thông minh từ góc độ giá trị dành cho khách hàng mà có thể bị bỏ qua trong các nghiên cứu trước đây. Tổng cộng có 347 dữ liệu khảo sát được thu thập và phân tích. Bằng cách xem xét sự nhận thức của khách hàng về công nghệ bán lẻ thông minh trong cả các khía cạnh lợi ích và hy sinh, kết quả cho thấy giá trị cảm nhận về công nghệ bán lẻ thông minh của khách hàng và giá trị mua sắm thông qua công nghệ bán lẻ thông minh của khách hàng có mối quan hệ tích cực với ý định sử dụng công nghệ bán lẻ thông minh. Nghiên cứu cũng xem xét tác động điều tiết của tính sáng tạo xã hội đối với mối quan hệ giữa giá trị được nhận thức của công nghệ bán lẻ thông minh, giá trị mua sắm được nhận thức và ý định sử dụng công nghệ bán lẻ thông minh, tuy nhiên, kết quả cho thấy không có tác động có ý nghĩa đối với cả hai mối quan hệ. Do đó, nghiên cứu này mang lại một số tác động lý thuyết và tác động thực tiễn đối với các công nghệ bán lẻ thông minh đối với cả nhà nghiên cứu và quản lý.

Từ khóa: Công nghệ bán lẻ thông minh, Mô hình áp dụng dựa trên giá trị, Giá trị cảm nhận, Ý định sử dụng.

1. Introduction

Research has shown that investing in smart retail technologies (SRTs) can lead to significant growth (Roy et al., 2018). Retailers are increasingly adopting SRTs to enhance the shopping experience for their customers (Adapa et al., 2020). SRTs encompass various smart devices, like

smartphones and tablets, designed to improve the customer's shopping journey. They not only enhance the physical retail experience but also empower customers in their purchasing decisions (Chen, 2023). As a

Lê Thị Bích Ngọc, Trường Đại học Kinh tế - Đại học Đà Nẵng

✉ Email: ngoc.ltb@due.udn.vn

result, retailers are integrating SRTs into their daily operations to establish a smart partnership with customers and provide superior shopping value (Adapa et al., 2020). These innovative technologies have transformed how retailers interact with customers, deliver services, and manage processes (Pantano & Dennis, 2019).

While empirical findings suggest that SRTs can enhance customer value and, consequently, their intention to use these technologies, the underlying mechanisms are not well understood. To address this research gap, this study employs the Value-Based Adoption Model (VAM) to investigate how SRT characteristics influence customers' perceived value and intention to adopt SRTs. Specifically, the study examines how SRTs impact customers' perceptions of both benefits and sacrifices, ultimately shaping the relationship between perceived values and the intention to use SRTs.

This study aims to overcome the limitations of previous research, which predominantly relied on traditional technological acceptance models like the Technology Adoption Model (TAM) or the Unified Theory of Acceptance and Use Technology (UTAUT). TAM and UTAUT primarily focus on the technological perspective of adoption, while this study emphasizes the commercial perspective. Customers who seek value in their spending decisions are more likely to accept and adopt SRTs (Kim et al., 2019). Therefore, this study provides a comprehensive theoretical foundation for understanding customers' behavior in adopting SRTs and their intentions to use them.

2. Literature review and hypotheses development

2.1. Literature review

2.1.1. Smart retail technology

SRT involves utilizing advanced technologies like radio frequency identification systems (RFIDs), self-service

tech, and contactless payments to enhance the retail experience (Adapa et al., 2020). These technologies create an interactive retail ecosystem with real-time data collection and personalized shopping experiences (Roy et al., 2018). SRT is seamlessly integrated into retail spaces, even enabling virtual try-ons and social interactions (Willems et al., 2017). It blurs the lines between physical and digital shopping, extending access to products through various devices (Pantano & Timmermans, 2014).

2.1.2. Value-based adoption theory

The VAM evaluates technology adoption through perceived value (Kim et al., 2007; Zeithaml, 1988). It examines how consumers assess a product's usefulness and enjoyment against technicality and perceived fees in their decision to adopt technology. VAM is widely used in various fields, such as IoT (Kim et al., 2017), accommodation apps (Kim et al., 2019), and internet shopping (Gupta & Kim, 2010).

In VAM, perceived advantage and novelty are intrinsic motivations, while enjoyment is extrinsic in adopting technology. These factors contribute to overall perceived value, influencing adoption. Prior studies, including Chen et al. (2018) and Roostika (2012), have recognized these motivations' impact on perceived value and adoption. Perceived sacrifices encompass non-monetary aspects like time and effort, while perceived complexity, similar to TAM's ease of use, reflects users' understanding. Perceived risk involves users' concerns about technology usage. This study investigates how perceived benefits (novelty, advantage, enjoyment) and sacrifices (complexity, risk) shape perceived value in technology adoption (Kim et al., 2007; Chen et al., 2018; Roostika, 2012) and perceived shopping value (Babin et al., 1994; Seo & Lee, 2008), consequently, intention to use SRTs.

2.2. Hypotheses development

2.2.1. Perceived novelty

Perceived novelty, which reflects users' perception of innovation as newer than existing technologies (Wells et al., 2010), plays a vital role in various fields like psychology, computer science, marketing, and social sciences. In social science, Dang (2020) explored how perceived novelty mediates the relationship between information confusion, psychological distress, and the intent to discontinue using social networking sites, highlighting its importance in technology adoption and usage.

Consistent with this perspective, prior research consistently demonstrates a strong link between perceived novelty and customer behavior when it comes to adopting new technology. Wells et al. (2010), for instance, studied the impact of perceived novelty on the intention to adopt novel technology, finding a positive correlation. Building on this established knowledge, this study suggests that perceived novelty related to SRT can positively influence customers' perceived value of SRT and their perceived shopping value through SRT. Therefore, the following hypotheses are proposed:

H1a: Perceived novelty of SRT has a positive effect on the customers' perceived value regarding SRT.

H1b: Perceived novelty of SRT has a positive effect on the customers' perceived shopping value.

2.2.2. Perceived advantage

Perceived advantage, representing how individuals perceive innovation as superior to current conditions and motivating adoption (Lu et al., 2015), plays a pivotal role in various technological adoptions. It is often measured by profitability, cost reduction, or transaction acceleration (Van

Huy et al., 2012). Several studies have investigated its impact on the adoption of technologies like e-commerce, mobile payments, and social media.

For instance, Rawash (2021) found that perceived advantage positively influenced SMEs' adoption of e-commerce, while Setiyani & Yeny Rostiani (2021) observed its positive effect on e-commerce technology adoption. When customers perceive that SRT enhances their shopping experience by offering convenience, efficiency, and task accomplishment, they attribute value to both SRT itself (Zhu et al., 2013) and the overall shopping experience (Adapa et al., 2020). Khan & Ali (2018) noted a positive impact of perceived relative advantage on retailers' intention to adopt mobile payment systems, while Mahakittikun et al. (2021) reported a positive association between relative advantage and firm performance. Tajudeen et al. (2018) highlighted a positive link between the perceived relative advantage of social media and its usage among organizations. Hence, the following hypotheses are proposed:

H2a: Perceived advantage of SRT has a positive effect on the customers' perceived value regarding SRT.

H2b: Perceived advantage of SRT has a positive effect on the customers' perceived shopping value.

2.2.3. Perceived enjoyment

Numerous studies in various domains have explored the importance of perceived enjoyment. For instance, Gao & Bai (2014) found that perceived enjoyment positively impacts the intention to use IoT technologies. Mohammad Al-Khasawneh (2022) revealed a significant positive influence of perceived enjoyment on the intention to use TikTok. Within e-commerce, Lu & Su (2009)

identified that perceived enjoyment positively affects customers' intention to use mobile shopping websites. Shen (2012) highlighted that factors like social comparison, social presence, and enjoyment significantly predict consumers' intention to use social shopping websites. In the retail sector, Chen et al. (2022) noted a positive relationship between perceived enjoyment and impulse buying behavior in virtual reality shopping environments.

Given these findings, it is plausible to suggest that perceived enjoyment can enhance both the perceived value of SRT and consumers' perceived shopping value through SRT, contributing to a positive shopping experience. Therefore, the following hypotheses are proposed:

H3a: Perceived enjoyment of SRT has a positive effect on the customers' perceived value regarding SRT.

H3b: Perceived enjoyment of SRT has a positive effect on the customers' perceived shopping value.

2.2.4. Perceived complexity

Perceived complexity, as described by Moore & Benbasat (1991), pertains to users' perception of technology as intricate and demanding substantial effort, which can act as a barrier to adoption (Akbulut, 2002; Chung & Liang, 2020; Sun & Qu, 2011; Santoso et al., 2022).

Regarding SRT, perceived complexity may hinder adoption despite its potential to enhance the shopping experience. If consumers find SRT complex, it could lead to frustration and diminish the perceived value of SRT. Therefore, it is reasonable to hypothesize that perceived complexity negatively affects consumers' perception of the shopping value provided by SRT (Akbulut, 2002; Chung & Liang,

2020; Sun & Qu, 2011; Santoso et al., 2022). Consequently, the following hypotheses are proposed:

H4a: Perceived complexity of SRT has a negative effect on the customers' perceived value regarding SRT.

H4b: Perceived complexity of SRT has a negative effect on the customers' perceived shopping value.

2.2.5. Perceived values of SRT and perceived shopping values through SRT

The most widely accepted definition of perceived value of (Zeithaml, 1988) which defined perceived value as "the consumer's overall assessment of the utility of a product based on perceptions of what is received and what is given". In the retail context, the higher the perceived value when using new technology, the more favorable users' attitudes and behavior (Yu et al., 2019). Besides, the customers' perceived shopping value is defined as "the perceived subjective worth that the consumer perceives in general inconsideration of all evaluation standards" (Babin et al., 1994). It is also the value that consumers perceive through the shopping experience at the store based on the store's properties (Seo & Lee, 2008).

Utilizing SRT may enable customers to complete their shopping tasks more efficiently and reflect the value of the shopping experience (Willems et al., 2017). When customers perceive that SRT could enhance their shopping experience in terms of both utilitarian and hedonic values, the overall shopping values may increase. Therefore, the following hypothesis is suggested:

H5: Perceived values of SRT have a positive effect on the customers' perceived shopping value.

2.2.6. *Perceived value of SRT, perceived shopping value through SRT, and intention to use SRT*

The VAM defines perceived value as the result of an overall evaluation of the relative perceived benefits and sacrifices associated with an offering (Kim et al., 2007; Vishwakarma et al., 2020). This concept has been widely used in various studies spanning domains such as IoT (Hsu & Lin, 2018), social commerce (Chen et al., 2018), wearable devices (Yang et al., 2016), and virtual reality in travel (Vishwakarma et al., 2020).

Previous research consistently highlights the critical role of perceived value in influencing consumers' intentions to adopt new technologies (Kim et al., 2007). For instance, Wang et al. (2018) found that perceived value significantly impacts the adoption of GPS navigation apps, while Yu et al. (2019) identified perceived value as a positive predictor of behavioral intention in adopting self-customization services. Additionally, higher overall perceived shopping value through SRTs has been associated with favorable behaviors like increased re-patronage intentions (Roy et al., 2017).

Given this established knowledge, this study suggests that customers' perception of the high value associated with using SRTs will drive their adoption. Therefore, the following hypothesis is proposed:

H6: Perceived value of SRT has a positive effect on the intention to use SRT.

H7: Perceived shopping value through SRT has a positive effect on the intention to use SRT.

The moderating effect of social innovativeness on the relationship between perceived value of SRT, perceived shopping value, and intention to use SRT

Social innovativeness, as defined by Tian and McKenzie (2001), relates to an individual's willingness to adopt innovative products relatively early after comparing themselves with others within a social system. This trait is associated with a desire to enhance both one's self-image and social image and is often connected to the need for uniqueness (Roehrich, 1994, 2004; Sadik-Rozsnyai & Bertrandias, 2019; Tian & McKenzie, 2001).

Individuals with a high degree of social innovativeness seek to distinguish themselves and may be more inclined to adopt new or unconventional technologies like SRTs.

Previous research, such as that conducted by Yu et al. (2019) and Sadik-Rozsnyai and Bertrandias (2019), has shown that social innovativeness can moderate the relationship between perceived benefits (or perceived costs) and perceived value in the context of self-service and new technological attributes. These findings suggest that social innovativeness may also play a moderating role in the relationship between perceived value, perceived shopping value, and intention to use SRTs.

Based on these premises, the following hypotheses are formulated:

H8a: Social innovation moderates the relationship between the perceived value of SRT and the intention to use SRT.

H8b: Social innovation moderates the relationship between the perceived shopping value of SRT and the intention to use SRT.

The study's research framework is presented in Fig. 1.

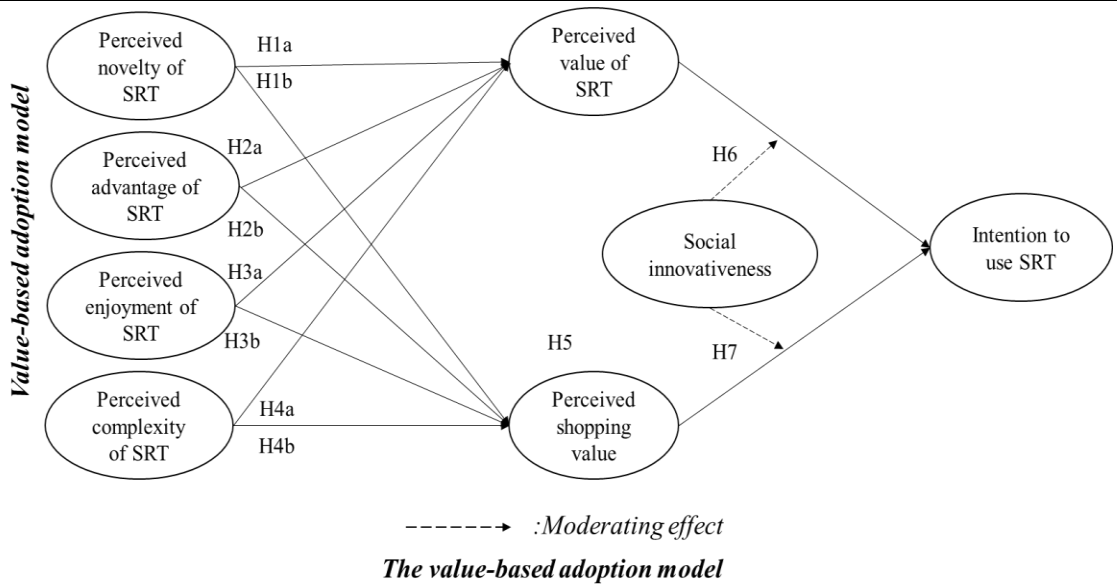


Fig 1: Research framework

2.3. Research method

2.3.1. Sample and data collection

To assess the conceptual model, an online survey was utilized to measure the constructs. The survey was administered to a panel of respondents, resulting in a sample size of 347. The survey was conducted online between February and May 2023, allowing for a broader and more diverse range of data sources and enhancing the representativeness of the response sample.

The respondents were screened to ensure they had experience with SRTs. Initially, 360

responses were received, but after removing inconsistent responses, a valid sample size of 347 was retained. The demographic information of the retained sample is presented in Table 1. Among the 347 respondents, 38.3 percent were males, and 61.7 percent were females. Most respondents belonged to the younger age group (less than 27 years old, Gen Z), and a significant majority (97.7 percent) were highly educated, holding university degrees or higher qualifications.

Table 1: Demographic information of respondents

Characteristics	Frequency	%	Characteristics	Frequency	%
Gender			Education		
Male	133	38.3%	Undergraduate	261	75.2%
Female	214	61.7%	Bachelor’s degree	60	17.3%
Age			Master’s degree and above	18	5.2%
Less than 27 (Gen Z)	323	93.1%	Other	8	2.3%
From 27 to 42 (Millennials)	22	6.3%			
More than 42 (Gen X)	2	0.6%			

2.3.2. *Measurement development of constructs*

All constructs in the study were measured using multiple-item perceptual scales that had been previously validated in prior research. These scales were adapted and reworded to specifically relate to the context of SRTs. To ensure clarity and comprehensibility, the preliminary instrument underwent a review process involving lecturers from universities specializing in the digital business field.

Following this review, the questionnaire was further refined through a pretest with a sample of real-case respondents. Multiple-item scales integrated from the literature were used to measure the key constructs in the study. Specifically, the measurement of perceived novelty was adapted from Wells et al. (2010), perceived advantage of SRT from Adapa et al. (2020), perceived enjoyment of experiencing SRT from Kim et al. (2017), and the perceived complexity of experiencing SRT from Adapa et al. (2020). The measurement of perceived value was adapted from Kim et al. (2007), social innovativeness from Sadik-Rozsnyai & Bertrandias (2019), and perceived shopping value and the intention to use SRT from Adapa et al. (2020).

All items were assessed using a 7-point Likert scale. The specific scale items used in the study can be found in Appendix 1.

2.3.3. *The overall model*

To evaluate the overall model fit, the assessment of an approximate model fit criterion was employed. Specifically, in PLS path modeling, the standardized root mean square residual (SRMR) was utilized (Hu & Bentler, 1999). The outcome of this evaluation indicated that the SRMR value for

the estimated model equaled 0.084, which is very close to the established cutoff value (Hu & Bentler, 1999). Consequently, it can be inferred that the model fit in this study was deemed acceptable.

3. **Data analysis and results**

3.1. *Convergent validity and discriminant validity*

In this study, data analysis was performed using the partial least squares (PLS) method, a structural equation modeling technique. PLS-SEM was chosen due to its flexibility in handling various data characteristics and sample sizes, and it is considered a suitable choice for structural equation modeling (Hair et al., 2012; Hu & Bentler, 1999).

The accuracy of the measurement model was assessed through reliability, convergent validity, and discriminant validity tests. Reliability was considered acceptable if both composite reliability and Cronbach's α exceeded 0.7. Convergent validity was evaluated using two criteria: item-construct loadings (λ) greater than 0.7 and average variance extracted (AVE) exceeding 0.5 for a construct. Discriminant validity was confirmed when the square root of the AVE for a construct was greater than its correlation with other constructs.

The results, as summarized in Table 3, showed that all item-construct loadings met the required criteria. Reliability and convergent validity were achieved, and discriminant validity was confirmed. The variance inflation factor (VIF) values, which ranged from 1.000 to 2.417, indicated no significant multicollinearity issue in the model (Hair et al., 2010). As a result, the model was deemed suitable for regression analysis.

Table 3: *Convergent validity*

Construct	Items	Factor loading (λ)	Mean	SD	CR	AVE	Cronbach's α
PNOV	PNOV1	0.738	4.24	1.791	0.702	0.618	0.815
	PNOV2	0.852	4.73	1.455			
	PNOV3	0.765	4.27	1.383			
PADV	PADV1	0.882	5.38	1.428	0.910	0.771	0.852
	PADV2	0.889	5.23	1.368			
	PADV3	0.864	5.33	1.340			
PENJ	PENJ1	0.785	5.15	1.295	0.906	0.615	0.875
	PENJ2	0.771	5.24	1.238			
	PENJ3	0.814	5.06	1.320			
	PENJ4	0.787	5.16	1.300			
	PENJ5	0.768	4.98	1.460			
	PENJ6	0.780	5.12	1.328			
PCOM	PCOM1	0.842	3.68	1.537	0.884	0.718	0.804
	PCOM2	0.882	3.56	1.472			
	PCOM3	0.817	3.63	1.515			
PV	PV1	0.737	4.52	1.413	0.881	0.651	0.821
	PV2	0.808	4.91	1.251			
	PV3	0.867	4.90	1.273			
	PV4	0.809	4.97	1.280			
PSV	PSV1	0.832	4.84	1.353	0.886	0.721	0.807
	PSV2	0.852	4.79	1.281			
	PSV3	0.863	5.03	1.238			
INT	INT1	0.825	5.44	1.314	0.890	0.730	0.815
	INT2	0.880	5.29	1.292			
	INT3	0.858	5.27	1.225			
SINO	SINO1	0.821	5.05	1.385	0.870	0.574	0.833
	SINO2	0.821	4.90	1.360			
	SINO3	0.787	4.73	1.560			
	SINO4	0.678	4.30	1.685			
	SINO5	0.667	4.66	1.657			

Table 4: *Discriminant validity (Heterotrait-monotrait - HTMT) ratios*

	INT	PADV	PCOM	PENJ	PNOV	PSV	PV	SINO	INO*PSV
PADV	0.612								
PCOM	0.199	0.114							
PENJ	0.738	0.697	0.346						
PNOV	0.462	0.632	0.422	0.607					
PSV	0.652	0.504	0.541	0.673	0.443				
PV	0.759	0.557	0.398	0.717	0.511	0.775			
SINO	0.425	0.351	0.436	0.519	0.325	0.513	0.442		
SINO*PSV	0.266	0.25	0.088	0.213	0.153	0.154	0.181	0.066	
SINO*PV	0.302	0.255	0.074	0.253	0.129	0.173	0.207	0.075	0.809

3.2. Hypotheses testing

For the regression analysis, an initial step involved conducting a bootstrap analysis with 1,000 resamples. Path coefficients were re-estimated using each of these resamples. Following the approach outlined by Rai et al. (2006), the vector of parameter estimates was

used to calculate parameter means, standard errors, and the significance of path coefficients, as well as indicator loadings and indicator weights. The model proposed in this study explained 45.6% of the variance in customers' intention to use SRT, as indicated by the adjusted R-square value of 0.456.

Table 5: *Structural model results*

Hypotheses	β	t-Value	Supported
H1a: PNOV \rightarrow PV	0.156	0.900 ^{ns}	No
H1b: PNOV \rightarrow PSV	0.120	0.883 ^{ns}	No
H2a: PADV \rightarrow PV	0.056	2.302*	Yes
H2b: PADV \rightarrow PSV	-0.049	2.008*	Yes
H3a: PENJ \rightarrow PV	0.208	6.684***	Yes
H3b: PENJ \rightarrow PSV	0.449	2.909**	Yes
H4a: PCOM \rightarrow PV	-0.162	3.414***	Yes
H4a: PCOM \rightarrow PSV	-0.259	5.958***	Yes
H5: PV \rightarrow PSV	0.381	5.798***	Yes
H6: PV \rightarrow INT	0.442	6.295***	Yes
H7: PSV \rightarrow INT	0.169	2.784**	Yes
H8a: SINO \rightarrow PV	-0.102	1.932 ^{ns}	No
H8b: SINO \rightarrow PSV	-0.012	0.204 ^{ns}	No

Table 5 summarizes the output of the PLS model. The results of Table 5 showed that Hypotheses 2-7 are supported. Specifically, the perceived advantage of SRT significantly impacts both the perceived value of SRT ($\beta=0.156$, $p < 0.05$) and perceived shopping value through SRT ($\beta=0.120$, $p < 0.05$). Likewise, perceived enjoyment has a positive significant effect on both the perceived value of customers ($\beta=0.449$, $p < 0.001$) and perceived shopping value through SRT ($\beta=0.208$, $p < 0.001$). The perceived complexity has a significant negative impact on both the perceived value ($\beta=-0.162$, $p < 0.001$) and perceived shopping value through SRT ($\beta=-0.259$, $p < 0.001$). The perceived value of SRT has a positive influence on perceived shopping value through SRT ($\beta=0.381$, $p < 0.001$). Both the perceived value and the perceived shopping value have a positive impact on the intention to use SRT of customers with ($\beta=0.442$, $p < 0.001$) and ($\beta=0.169$, $p < 0.005$), respectively. Unexpectedly, the perceived novelty does not affect both perceived value and perceived shopping value. Similarly, the moderating effect of social innovativeness also has a non-significant effect. The findings will be discussed in detail in the next section.

4. Discussion, implications, limitations, and future research

4.1. Theoretical implications

This study contributes significantly to the theoretical understanding of SRT adoption. Firstly, it introduces the VAM as an alternative to the commonly used TAM for examining SRT adoption. VAM incorporates cost-benefit factors, offering a fresh and comprehensive perspective on how consumers decide to adopt SRTs which aligns with the arguments of Adapa et al. (2020). Accordingly, our findings indicate that within a smart retailing environment, the way customers assess the newness of features, attributes, and functions provided by SRTs is crucial in developing positive customers' perceived value of SRTs and customers' perceived shopping value through SRTs, consequently, their intention to use SRTs. Secondly, the research delves into the concept of social innovativeness and its role in SRT adoption. Contrary to the assumption that SRTs primarily enhance users' social image (Yu et al. 2019; Sadik-Rozsnyai & Bertrandias, 2019), the study suggests that other factors play a more critical role in

adoption decisions. This insight has practical implications for retailers aiming to promote SRT adoption by focusing on these factors. In summary, this study advances the field of SRT adoption research by introducing VAM and shedding light on the nuances of social innovativeness, providing valuable guidance for future studies in this domain.

4.2. Practical implications

This study provides actionable insights for retailers looking to enhance customer experiences through SRTs based on the cited sources. First, the perception of advantage which has a positive relationship with the perceived value of SRT and overall perceived shopping value is crucial information for retailers (Overby & Lee, 2006). Accordingly, retailers should consider implementing and integrating suitable SRTs to provide optimal benefits to consumers (Wang et al., 2015). Regarding the perception of enjoyment, retailers should pay attention to constructing the customer shopping journey as an experience filled with delight rather than a mere "mandatory task" (Gao & Bai, 2014). Retailers should prioritize SRTs offering clear benefits, support virtual and physical shopping integration, and employ customer care systems (Kim et al., 2017; Sohn & Kwon, 2020). To create engaging shopping experiences, they can use gamification, Virtual Reality (VR), and Augmented Reality (AR) (Chen, 2023).

Addressing perceived complexity is crucial; retailers can train staff, simplify app installations, and leverage advanced

intelligent technologies (Adapa et al., 2020). Introducing novel SRTs can provide fresh experiences (Adapa et al., 2020; Wells et al., 2010). Social innovativeness may not significantly affect the perceived value of SRTs, reducing the need for social image differentiation (Roehrich, 1994; Kaur & Soch, 2018).

By applying these insights, retailers can optimize SRTs, enhance customer experiences, and stay competitive in the evolving retail landscape.

4.3. Limitations and future research

This study has several limitations to consider for future research: First, the convenience sampling method used may not fully represent diverse participant characteristics, including cultural backgrounds and shopping habits. Second, future studies could explore additional factors beyond those investigated in this research that might influence customers' intentions to use SRTs. Third, the study was conducted in Vietnam, where SRTs are still emerging. The role of novelty might differ in more mature SRT markets, so exploring such variations could be valuable. Lastly, future research could focus on specific SRTs, such as mobile apps, smart payment systems, or in-store technologies, to identify the most effective smart technologies for integration into retail stores.

Addressing these limitations can lead to a more comprehensive understanding of customer behaviors and perceptions of SRTs in the retail sector.

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Appendix 1: Scale sources and adapted items used in this study

Constructs	Items code	Adapted items used in the study	Sources
Perceived novelty	PNOV1	The concept of SRT is new.	(Wells et al., 2010)
	PNOV2	The concept of SRT is unique.	
	PNOV3	The concept of SRT is original.	
Perceived advantage of SRT	PADV1	Using SRT enables me to accomplish my shopping tasks more quickly.	(Adapa et al., 2020)
	PADV2	Using SRT improves the quality of shopping I do.	
	PADV3	Overall, I find using SRT to be advantageous in performing my shopping.	
Perceived enjoyment	PENJ1	Shopping with this technology would make me feel good.	(Kim et al., 2017).
	PENJ2	Shopping with this technology would be enjoyable.	
	PENJ3	Shopping with this technology would be exciting.	
	PENJ4	Shopping with this technology would be exciting.	
	PENJ5	Shopping with this technology would involve me in the shopping process.	
	PENJ6	Shopping with this technology would be interesting.	
Perceived complexity	PCOM1	SRT is complicated.	(Adapa et al., 2020)
	PCOM2	SRT takes a lot of effort.	
	PCOM3	SRT is confusing.	
Perceived risk	PRISK1	I feel uncertain about how to effectively use the SRT.	(Adapa et al., 2020)
	PRISK2	I am not fully capable of using the SRT.	
	PRISK3	Using the SRT is not within the scope of my abilities.	
Perceived value	PV1	Compared to the fee I need to pay, the use of SRT offers value for money.	(Kim et al., 2007)
	PV2	Compared to the effort I need to put in, the use of SRT is beneficial to me.	
	PV3	Compared to the time I need to spend, the use of SRT is worthwhile to me.	
	PV4	Overall, the use of SRT delivers me good value	
Perceived shopping value	PSV1	The products in this retail store are reasonably priced.	(Adapa et al., 2020)
	PSV2	This retail store offers value for money.	
	PSV3	This retail store has good products for the prices set.	
Intention to use SRT	INT1	Given a chance, I intend to use SRT in the future.	(Adapa et al., 2020)
	INT2	I will frequently use SRT in the future.	
	INT3	I intend to use SRT in my next shopping trip.	
Social innovativeness	SINO1	I love to use innovations that impress others.	(Sadik-Rozsnyai & Bertrandias, 2019)
	SINO2	I like to own a new product that distinguishes me from others who do not own this new product.	
	SINO3	I like to outdo others, and I prefer to do this by buying new products which my friends do not have.	
	SINO4	I deliberately buy novelties that are visible to others and which command respect from others.	
	SINO5	I prefer to try new products with which I can present myself to my friends and neighbors.	