

Perceived Usefulness and Perceived Ease of Use Influencing Intention to Use Smart Shopping Carts among Retail Customers in Malaysia

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Abstract

The rapid advancement of digital technologies has significantly transformed the retail landscape, with innovations such as smart shopping carts enhancing customer experiences through features like AI personalization, IoT inventory management, AR, and robotics. Despite these potential benefits, adoption in Malaysia remains limited due to barriers such as technology anxiety, perceived difficulty of use, and doubts about usefulness caused by technical issues such as inaccurate scanning, limited capacity, and irrelevant AI recommendations. This study aims to identify the level of factors influencing the intention to use smart shopping carts among Malaysian retail customers by determining the levels of perceived usefulness and perceived ease of use, and evaluating the relationship between these factors and customers' intention to adopt the technology. The study employed the Technology Acceptance Model (TAM) that focuses on perceived usefulness and perceived ease of use as primary determinants. This study's target population is Malaysian retail customers aged 18 and above, who have purchasing power. Data were collected through an online questionnaire distributed via Google Forms, resulting in 273 valid responses from a sample size of 384 that was determined using Krejcie & Morgan's (1970) table. Data analysis was conducted using SPSS, including descriptive statistics, reliability testing, normality checks, and Spearman's correlation analysis. The results indicate high levels of perceived usefulness, perceived ease of use, and intention to use smart shopping carts, with strong positive correlations between perceived usefulness and intention to use ($r = 0.767, p < 0.01$) and between perceived ease of use and intention to use ($r = 0.735, p < 0.01$). Perceived usefulness and perceived ease of use are considered sufficient in this study because they capture customers' primary evaluations of whether the smart shopping cart provides clear benefits and whether it can be used without difficulty. Therefore, this study focuses on PU and PEOU as the core predictors of intention to use smart shopping carts. Future research is recommended to explore additional factors and utilize mixed methods to gain deeper insights into smart shopping cart usage in Malaysia.

1. Introduction

The retail industry is one of the biggest contributors to Malaysia's gross domestic product (GDP) and provides employment opportunities. Hypermarket retailing is one of the forms of modern grocery retailing in Malaysia that is experiencing widespread expansion, and the industry is expected to expand continuously and remain immune to the maturity phase (Hassan *et al.*, 2013). In recent years, the retail industry has experienced a significant and dynamic transformation driven by the rapid advancement and integration of modern technologies. In addition, Malaysia's retail industry experienced consistent progress in 2024, with sales rising by 3.8%. Looking ahead, the sector is forecasted to grow more rapidly in 2025, with estimates ranging between 4.3% and 5.2%. This anticipated growth is expected to be fueled by seasonal festivities, a rebound in tourism, increasing household incomes, and recent public sector wage adjustments. In March 2025, retail sales surged by 6.6% compared to the previous year, largely due to robust demand in general merchandise outlets, food and beverage businesses, and automotive sales. Meanwhile, total sales in the wholesale and retail trade sector reached RM154 billion that month. It marked a 5.7% annual increase (DOSM, 2024).

The introduction of the smart shopping cart is the most promising innovation in the retail industry (Wang *et al.*, 2025a). Smart shopping cart has integrated advanced features to be in line with retail's advancement technology. Smart shopping cart is a specialised form of cashierless purchasing system that enables customers to replace traditional shopping checkout lines with a new modern shopping method. According to Mohamed Jasim K (2024) smart shopping cart services are now available to consumers of leading supermarket chains worldwide. These innovative carts are equipped with weight sensors, barcode scanners, and touchscreens, which allow consumers to scan and bag items as they shop, receive personalised product recommendations, and easily locate products within the store. Smart shopping cart can enhance customer satisfaction, experience, and loyalty by streamlining the purchasing process, thereby saving customers time and making the shopping experience more efficient and enjoyable. Smart shopping cart is designed to solve common challenges found in traditional retail, such as long checkout queues, manual price checking, and inefficient shopping processes (Roslan & Haron, 2024).

The Technology Acceptance Model (TAM) framework is a popular framework that examines the influence of an individual's perception of technology on their intention to use technology. Perceived usefulness (PU) and perceived ease of use (PEOU) are the two primary determinants of an individual's decision to use technology. It supporting by Schultz & Zacheus (2024) found that customers generally have a positive attitude towards technology acceptance, which is driven by perceived usefulness and ease of use. Perceived Usefulness refers to the degree to which a person believes that using a particular system will enhance their job performance or daily tasks, essentially reflecting the expected benefits or productivity gains from the technology. These two perceptions shape the user's attitude toward the technology and their behavioural intention to use it. Given that the smart shopping cart is a newly developed technology, it is appropriate to apply the TAM (Wu *et al.*, 2024). Therefore, to close the knowledge gap in this area, this study aims to determine factors influencing the intention to use smart shopping carts for retail purposes among customers in Malaysia by using the TAM to help investigate customers' intention to use the smart shopping cart.

Smart shopping carts helps solve common problems in shopping activities such as time-consuming processes, overspending, and inefficient checkout systems (Wang *et al.*, 2025). By the integrating of AI-driven personalization (Shankar, 2018), IoT-enabled inventory management with an RFID system (Poojary & Kumar, 2014) Immersive augmented reality (AR) (Ramakrishnan *et al.*, 2024), and robotics that automate customer interactions (Gratton, n.d.). However, despite the benefits of smart shopping carts, the level of usage of smart shopping carts is still in early stages. It remains limited, partly due to factors related intention to use smart shopping carts. Several major problems have been found that make it hard for smart shopping carts to be widely used. A lot of people who use these systems think they are hard to understand or scary, especially those who are not good with technology or have technology anxiety (Zaki & Broujerdi, 2020). This idea of difficulty makes them less comfortable and less sure of their ability to use these new technologies (Dominici *et al.*, 2016). Second, some users see the benefits of smart shopping carts, like saving time or making it easier to pay, but others are not sure if it will be useful, which makes people question of it usefulness (Perumal *et al.*, 2022).

In the perspective of perceived usefulness limitation, smart shopping carts often fail to meet users' expectations of usefulness. Technical issues like inaccurate item scanning and sensor limitations is negatively impact the usefulness of the smart shopping cart. For instance, carts with limited capacity are impractical for bulk shoppers, reducing perceived usefulness for families. Additionally, AI-driven recommendations often lack relevance, failing to enhance shopping experiences as intended (Silberstein, 2024). Besides, perceived ease of use can be hindered by customers' lack of technology information and technology anxiety, and it could make them less willing to use smart shopping carts. (Dominici *et al.*, 2016) For instance, customers may also be less likely to use a smart shopping cart if they have negative opinions about it or find it hard to use. The complicated design system and frequent technical error have made the cart hard to use. New users often struggle with scanning barcodes, producing identification, and fixing system errors. It leads to the user's frustration when they use it. Older people and those with technology anxiety may feel uncomfortable using touchscreens or automated payment systems

(Dominici *et al.*, 2016). While various global studies have explored smart shopping cart adoption using TAM, there is a notable gap in localized research within Malaysia. Especially one that specifically investigates how perceived usefulness and perceived ease of use influence intention to use smart shopping carts. Existing Malaysian studies have primarily focused on general smart retail technology (Perumal *et al.*, 2022) but have not examined smart shopping carts.

Therefore, to achieve the research objectives, the level of intention to use smart shopping carts among retail customers in Malaysia is identified. Furthermore, the level of perceived usefulness and perceived ease of use of smart shopping carts among retail customers in Malaysia is determined. Consequently, the relationship between perceived usefulness and perceived ease of use with the intention to use smart shopping carts among retail customers in Malaysia is evaluated.

2. Literature Review

2.1 Smart Shopping Carts

The concept of smart shopping carts represents a transformation for the retail industry, as it combines new technology with the traditional shopping experience at a retail store. smart shopping carts are designed to meet the needs of customers who want convenience, personalization, and speed (Mhetre *et al.*, 2024). Additionally, smart shopping carts is one of the smart retail technologies designed to enhance the shopping experience for customers. smart shopping carts' main characteristic is the installation of Radio Frequency identification (RFID) that enables real-time tracking and automated billing without the need for manual scanning (B *et al.*, 2021). Additionally, Smart shopping carts feature weight sensors, touchscreens, RFID scanners, a camera, and AI-powered systems. Customers can now scan items while they shop, get real-time product information, recommendations, and check out on their own right from the cart. This means customers can eliminate the need to wait in long queues at billing counters.

2.2 Intention to Use

The intention to use is closely related to the user's willingness to use the system. It represents a fundamental concept in technology adoption research as it is a major indicator of actual usage behaviour. Intention to use smart shopping carts can be defined as the user's willingness to use the system (Mardiana *et al.*, 2015). It also represents the level to which an individual has made an intentional decision to perform or not perform certain future behaviour (Humida *et al.*, 2022). In the context of smart retail environments, "intention to use smart shopping carts" refers to customers' willingness to use shopping cart systems that have capabilities like automated checkout, product scanning, navigation aid, and customized shopping experiences.

2.3 Technology Acceptance Model

The Technology Acceptance Model (TAM) is formulated by Davis (1989), It is a well-known theoretical framework for evaluating users' acceptance and adoption of new technology. According to Marikyan and Papagiannidis (2022), the Technology Acceptance Model (TAM), a leading framework in this area, explicitly identifies perceived usefulness and perceived ease of use as the two primary determinants influencing an individual's intention to use a technology.

2.3.1 Perceived Usefulness

Perceived usefulness is defined as individuals' perception that using a specific technology will improve their performance or provide a beneficial outcome in completing a task. According to the TAM, it shows that perceived usefulness is a term that describes the degree to which an individual anticipates that a technology will enhance their job performance or efficiency (Davis, 1989) In the context of smart shopping cart, customers' perceptions of the usefulness of smart shopping carts for retail customers have a considerable impact on whether or not they intend to use of these carts. The shopping experience is improved by smart shopping carts because they offer functionalities such as instant price verification, product availability, individualized promotions, and speed checkout process. This results in an improved shopping experience. It demonstrates that consumers who are aware of these functional advantages are more likely to have a greater intention to use smart shopping carts. Supported by a previous study by Purwanto *et al.* (2024) that found perceived usefulness has significant influence on users' intention to use the technology, as users are more likely to adopt systems that offer tangible benefits such as time savings, convenience, and improved services efficiency.

2.3.2 Perceived Ease of Use

A previous study by Davis (1989) on the Technology Acceptance Model (TAM) states that the term perceived ease of use (PEOU) relates to how an individual feels about a specific technology that would be easy to use. In the context of intention to use smart shopping carts, PEOU is important because these carts have enhanced the traditional shopping experience with the digital element that must be accessible and effortless to operate. According to Schultz & Zacheus (2024), customers are more likely to view smart shopping carts as helpful tools when they find them easy to use. This will improve their attitude toward the technology and increase their intention to use it.

2.4 Previous Study on Relationship Between Perceived Usefulness, Perceived Ease of Use, and Intention to Use Smart Shopping Carts

Perceived usefulness (PU) is widely acknowledged as a key factor influencing users' intention to use smart shopping carts. Schultz and Zacheus (2024) found that customers in physical grocery stores were more inclined to use smart carts when they offered clear benefits, such as real-time product tracking and faster checkout. This aligns with findings from Louis *et al.* (2023), who reported that PU significantly shaped users' attitudes and intentions in digital banking, reinforcing the role of PU in the Technology Acceptance Model (TAM). Similarly, Marikyan and Papagiannidis (2022) highlighted PU as a consistent predictor of technology adoption across various settings, including retail. However, the effect of PU may vary based on context. For instance, Perumal *et al.* (2022) noted that in Malaysia, PU alone did not strongly drive adoption of smart retail technologies, with ease of use playing a more central role, particularly among less experienced users. Dominici *et al.* (2016) further emphasized that users' familiarity with technology influenced the impact of PU, as seen in differing responses between Italian and Croatian shoppers. These findings suggest that while PU is influential, its effectiveness depends on user experience and cultural context.

Perceived ease of use (PEOU) plays a vital role in encouraging the adoption of smart shopping carts by reducing technological barriers. Research by Schultz and Zacheus (2024) showed that users were more inclined to try smart carts when they found them simple to navigate and easy to learn. Similar findings in Malaysia by Perumal *et al.* (2022) highlighted PEOU as a key factor, particularly among older or less tech-savvy individuals. Dominici *et al.* (2016) emphasized the importance of user-friendly interfaces to minimize fear and anxiety. Marikyan and Papagiannidis (2022) noted that PEOU influences user attitudes, leading to greater acceptance even if the technology's usefulness is moderate. In digital banking, Louis *et al.* (2023) found that ease of use enhanced perceived usefulness, reinforcing usage intentions. Nonetheless, usability issues such as barcode errors or unstable internet can undermine PEOU. Therefore, ensuring both simplicity and reliability is essential, especially in regions with diverse digital literacy levels like Malaysia.

To conclude, both PU and PEOU are important determinants that influence the intention to use of smart carts. The combination of both influences the shape of user attitude and intention to use smart shopping carts.

3. Research Methodology

3.1 Research Design

This study employed a quantitative research method to investigate the relationship between perceived usefulness and perceived ease of use on intention to use smart shopping carts among retail customers in Malaysia. According to Sim Hong Liang (2023), the quantitative method helps the researcher to make decisions on whether to accept or reject those hypotheses of the study, which determine the relationship between variables. In this study, the researcher used a questionnaire to gather data, which will be distributed randomly to the retail customers in Malaysia. The software program Statistical Package for the Social Sciences (SPSS) was used by the researchers to analyze the collected data in the study. It is to ensure the accuracy and credibility of the data. This study also included several types of analysis, such as correlation, normality, reliability, and descriptive statistics. To conclude, the result of these analyses has determined the relationship between perceived usefulness and perceived ease of use on intention to use smart shopping carts among retail customers in Malaysia.

3.2 Research Population and Sample

3.2.1 Population

According to Thomas (2023), Population is the term used in research methodology to describe the comprehensive collection of individuals, objects, or events that share specific characteristics and serve as the focal point of the investigation. Knowing the population size is important because it defines the scope for applying results. This study is focus on retail customers in Malaysia. The population refers to the Malaysian citizens with purchasing power, specifically adults aged 18 and above. According to the Department of Statistics Malaysia (DOSM), the

estimated number of Malaysian citizens with purchasing power is approximately 17.9 million as of 2024. To ensure statistical reliability, the Krejcie and Morgan table was used to determine representative sample size.

3.2.2 Sampling

The sampling method is the way to choose a small group of people or items from a larger group to research or analysis (Babbie, 2020). Sampling is an important part of the research technique because it helps researchers collect data in a way that is both successful and cost-effective, while also minimizing costs and resources (Nikolopoulou, 2022). In this study, the researcher uses the Krejcie & Morgan (1970) sample size table to determine the appropriate sample size needed for a given population size. This study decided to use a non-probability sampling method, which is convenience sampling with a sample size of 384 respondents with a population of 17.9 million citizens in Malaysia that have purchase power. The researcher employs non-probability convenience sampling due to challenges in accessing a complete sampling frame of Malaysia's large and fragmented retail customer base.

3.3 Research Instrument

A research instrument is any tool or method employed to systematically collect, measure, or evaluate data in a study, including surveys, interviews, or observation checklists (Gumberg Library, 2022). For this study, a questionnaire is a primary data collection method used by the researcher to collect data from 384 retail customers in Malaysia, as shown in Table 1. The researcher decided to use an online questionnaire through Google Forms. The questionnaire consists of three primary parts, sections A, B, C, and D. Section A is for collecting information about the respondent's demographics. Sections B and C focus on independent variables, which are the level of perceived usefulness and the level of perceived ease of use. Lastly, section D was developed with questions for dependent variables which is intention to use the smart shopping cart. Section A uses an ordinal scale, and sections B, C, and D use a five-point Likert scale to assess participants' responses systematically.

Table 1 Questionnaire Variables

Variables	Adapted from	Item	Likert Scale
Perceived Usefulness	Louis <i>et al.</i> , 2023	4	5-Point Likert Scale
Perceived Ease of Use		4	1.Strongly Disagree 2. Disagree
Intention to Use Smart Shopping Carts		4	3. Neutral 4. Agree 5.Strongly Agree

3.4 Pilot Study

A pilot study is conducted to assess the viability, validity, and dependability of the research design, methods, and instruments. Its primary objective is to identify and address any logistical, procedural, or methodological issues that may arise throughout the lengthy research process. Researchers can test data collection procedures, enhance research protocols, and evaluate the appropriateness and lucidity of survey instruments or experimental manipulations through a pilot study, which often uses a smaller sample size or a subset of the target population. In this study, pilot study collects data using the same instruments that will be used in the subsequent, more extensive investigation. A pilot research conducted in Malaysia involved 30 respondents, constituting 10% of the total sample size of 384 respondents. Thus, reliability tests were used to determine the dependability of the study equipment, specifically the survey questionnaire. The Cronbach's alpha method is a statistical method used to evaluate the reliability and consistency of a scale or instrument measuring a construct. It is used in order to assess internal consistency of the data and ensure the instruments are reliable and consistent.

3.5 Data Collection

Data collection is the process of gathering, measuring, and assessing accurate insights for research through defined and accepted methodologies (Smith, 2021). A researcher may assess their hypothesis based on the collected evidence (Jones & Brown, 2020). Data collection is typically the earliest and most crucial stage in the research process, despite the field of study (Johnson *et al.*, 2022). In this study, researcher have used both primary data and secondary data as data collection methods. It is used to gather data that related to relationship between perceived usefulness and perceived ease of use on intention to use smart shopping carts among retail customers in Malaysia. The primary data were collected by a survey distributed to retail customers in Malaysia, while the secondary data were obtained from various sources (Bougie & Sekaran, 2019).

3.6 Data Analysis

Data analysis refers to the systematic process of inspecting, transforming, and modeling data to extract meaningful insights and support decision-making. In this study, data analysis was conducted using four statistical techniques to address the research objectives. Descriptive analysis (mean, standard deviation) summarized demographic profiles and baseline perceptions of smart shopping carts, providing a foundational understanding of respondents' characteristics and initial attitudes. Reliability analysis (Cronbach's $\alpha \geq 0.7$) then verified the internal consistency of the questionnaire items measuring perceived usefulness (PU) and perceived ease of use (PEOU), ensuring the instrument's stability for hypothesis testing. Normality analysis (Skewness ± 1.96 , Kurtosis ± 3.0) subsequently confirmed that the data distribution met parametric test assumptions, validating the use of Pearson's correlation for relationship analysis. Finally, correlation analysis (Pearson's r) quantified the strength and direction of relationships between PU, PEOU, and intention to use smart shopping carts, testing hypotheses derived from the Technology Acceptance Model (TAM). These analyses were executed using SPSS software, enabling rigorous examination of how users' perceptions shape adoption intentions in Malaysia's retail sector, as outlined in Krejcie & Morgan's (1970) sampling framework.

4. Results and Discussion

The researchers distributed 384 sets of structured questionnaires in the e-form to retail customers in Malaysia. This distribution strategy was in accordance with the guidance of Krejcie & Morgan (1970), who recommended a sample size of 384 for the study, as the population total is 17.9 million retail customers in Malaysia. As a result, the researchers received 273 complete questionnaires. This means that the response rate of this study was 71.10%.

4.1 Reliability Analysis

Based on Table 2, it shows the results of the reliability analysis for the pilot test. Researcher has reached 30 retail customers in Malaysia as the target respondents to carry out the pilot study for the practicality and feasibility of the main research. The Cronbach's Alpha value for perceived usefulness was 0.886, 0.874 for perceived ease of use, and 0.869 for intention to use. Respectively, failing within the good level range (0.8 to 0.9).

Besides, in the actual study, the researchers received 273 complete questionnaires from retail customers in Malaysia. The Cronbach's Alpha for perceived usefulness was 0.893. Demonstrating a good level of internal consistency and maintaining it at this level. The "perceived ease of use" variable has an excellent internal consistency, with Cronbach's Alpha of 0.924. Meanwhile, the dependent variable in this study, intention to use, was confirmed to be reliable with a Cronbach's Alpha of 0.903, with excellent internal consistency. The results show that all the questions used in this study's questionnaire are trustworthy and acceptable, and fit with Cronbach's Alpha values of at least 0.7 for variables.

Table 2 Reliability test for pilot study and actual study

Variables	Pilot Study		Actual Study	
	Cronbach's Alpha	Interpretation	Cronbach's Alpha	Interpretation
Perceived Usefulness	0.886	Good	0.893	Good
Perceived Ease of Use	0.874	Good	0.924	Excellent
Intention to Use Smart Shopping Carts	0.869	Good	0.903	Excellent

4.2 Demographic Analysis

The items in demographic analysis include gender, age, race, level of education. As illustrated in Table 3 above, majority were female (57.5%), 18 to 25 years old (57.1%), Malay (65.6%) and degree level of education (56.4%).

Table 3 Demographic profile of respondents

Demographic	Items	Frequency	Percentage (%)
Gender	Female	157	57.5
	Male	116	42.5
	Total	273	100
Age	18 – 25 Years old	156	57.1
	26 – 35 Years old	46	16.8

	36 – 45 Years old	30	11
	46 – 55 Years old	32	11.7
	56 Years old and above	9	3.3
	Total	273	100
Race	Malay	179	65.6
	Chinese	47	17.2
	Indian	35	12.8
	Others	12	4.4
	Total	273	100
Level of Education	School	27	9.9
	Diploma	67	24.5
	Degree	154	56.4
	Master	15	5.5
	PhD	10	3.7
	Total	273	100

4.3 Descriptive Analysis

Descriptive analysis was developed to examine the relationship between perceived usefulness and perceived ease of use on intention to use smart shopping carts among retail customers in Malaysia. Overall, the findings indicate that respondents hold positive perceptions towards smart shopping cart technology, with a high mean score. Specifically, perceived usefulness recorded a mean score of 4.34 with a standard deviation of 0.837 as shown in Table 4. It shows that respondents strongly believe smart shopping carts provide significant benefits in enhancing their shopping experience. Similarly, perceived ease of use recorded a high mean score of 4.13 and a standard deviation of 0.919. It indicates that respondents generally strongly agree that smart shopping carts are easy to learn and use. The dependent variable, intention to use smart shopping carts, also achieved a high mean score of 4.32 with a standard deviation of 0.841. Indicating a high level that reflects customers' willingness to use this retail technology in future. Overall, the consistently high mean scores and relatively low standard deviations across the variables indicate a strong central tendency and general agreement among respondents.

Table 4 Overall analysis of mean and standard deviation for the variables

Item	Mean (μ)	Std. Deviation (σ)	Level
Perceived Usefulness	4.34	0.837	High
Perceived Ease of Use	4.13	0.919	High
Intention To Use Smart Shopping Cart	4.32	0.841	High

4.4 Normality Analysis

This research used the Kolmogorov-Smirnov test due to the study's sample size exceeding 50, as shown in Table 5. The result of the test for normality shows that the p-value for the dependent variable is less than 0.01. This suggests that the data did not follow a normal distribution, and this study will proceed with conducting a Spearman's correlation analysis.

Table 5 Result of normality test

Item	Kolmogorov-Smirnov		
	Statistic	df	Sig.
Perceived Usefulness	0.175	273	<0.01
Perceived Ease of Use	0.156	273	<0.01
Intention To Use	0.181	273	<0.01

4.5 Correlation Analysis

The Spearman correlation analysis reveals a significant positive relationship between the independent variables and the dependent variable, Intention to Use (ITU) smart shopping carts. Based on Table 6, PU (IV1) shows a strong positive correlation with ITU, with a correlation coefficient of 0.767 and a significance value of p is 0.000. It indicates a highly significant relationship. Meanwhile, PEOU (IV2) also shows a strong positive relationship with ITU, with a correlation coefficient of 0.735 and a significance value of p is 0.000. Therefore, both of the hypotheses, H1 and H2 is being accepted in this research.

H1: There is a significant relationship between perceived usefulness and intention to use a smart shopping cart.
H2: There is a significant relationship between perceived ease of use and intention to use a smart shopping cart.

Table 4 Result of correlation between the variables

Variables	Correlation Coefficient	Sig. (2-tailed)
Perceived Usefulness (PU)	0.767	0.000
Perceived Ease of Use (PEOU)	0.735	0.000

5. Conclusion

The results showed that Malaysian retail customers have a high level of intention to use smart shopping carts, indicating a positive attitude toward smart retail technologies. Respondents demonstrated strong willingness to continue using smart shopping carts and to recommend them to others, reflecting openness toward technological innovations that enhance convenience and efficiency in physical retail environments.

Perceived usefulness emerged as the most influential factor, with respondents strongly agreeing that smart shopping carts improve shopping efficiency, save time, assist in managing expenses, and enhance the overall shopping experience. Perceived ease of use also recorded a high level of agreement, indicating that customers generally perceive smart shopping carts as easy to learn and user-friendly. These findings highlight the importance of designing smart retail technologies that provide clear functional benefits while remaining simple and intuitive to use.

Spearman's correlation analysis revealed strong positive relationships between the independent variables and intention to use smart shopping carts. Perceived usefulness showed a strong positive correlation with intention to use ($r = 0.767$), while perceived ease of use also demonstrated a strong positive correlation ($r = 0.735$). These results confirm the applicability of the Technology Acceptance Model in the Malaysian retail context. However, the study is limited by its quantitative approach, restricted variables, and reliance on self-reported data. Future research is recommended to include additional determinants, adopt mixed or qualitative methods, and focus on specific customer segments to gain deeper insights into smart shopping cart adoption.

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Conflict of Interest

Authors declare that there is no conflict of interests regarding the publication of the paper.

Author Contribution

The authors confirm contribution to the paper as follows: **study conception and design:** Fatin Nur Raihana Riduan and Mohd Zarir Yusoff; **data collection:** F.N.R.R and M.Z.Y; **analysis and interpretation of results:** Fatin Nur Raihana Riduan; **draft manuscript preparation:** Fatin Nur Raihana Riduan and Mohd Zarir Yusoff. All authors reviewed the results and approved the final version of the manuscript.

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