European Journal of Applied Business Management, Special Issue on Marketing: The Evolution of AI-Based Marketing: Trends, Challenges and Opportunities, 2026, pp. 14-38

EJABM European Journal of Applied Business and Management
ISSN 2183-5594

Research Paper

V-Commerce: Factors Influencing the Purchase Intention of Portuguese Consumers

Submitted on 03rd October 2025
Accepted on 24th November 2025
Evaluated by a double-blind review system

SARA TEIXEIRA[1]
SANDRINA TEIXEIRA[2]

ABSTRACT

Purpose: E-commerce usage is growing rapidly due to technological advancements and changes in consumer behaviour. An emerging trend in e-commerce is v-commerce, which uses immersive technologies to deliver interactive experiences for consumers. Therefore, it is essential to understand the consumer and their purchasing behaviour in this medium.

Methodology: To achieve this objective, a quantitative methodology was employed using an online questionnaire (N=100).

Results: The study concluded that a positive attitude towards v-commerce influences purchase intention, and that perceived usefulness, perceived ease of use, and perceived convenience also influence purchase intention among Portuguese consumers.

Research limitations: This study is limited by a small, non-representative sample and the exclusion of additional influencing factors. Future research could expand on these areas.

Practical implications: The goal of this study is to provide insights into consumer behaviour and the factors that determine purchase intention, enabling managers and marketers to enhance their strategic decision-making.

Originality: The study explores the emerging trend of v-commerce and provides valuable insights into how immersive technologies can influence purchase intention —an area that has not been extensively studied.

Keywords: *V-commerce; purchase intention; attitude; consumer behaviour; immersive technology.*

[1] CEOS.PP, Polytechnic of Porto, ISCAP, Portugal. sarat@iscap.ipp.pt
[2] CEOS.PP, Polytechnic of Porto, ISCAP, Portugal. sandrina@iscap.ipp.pt

EJABM European Journal of Applied Business and Management
ISSN 2183-5594

1. Introduction

The relevance of e-commerce to consumers has grown significantly in recent years, becoming an important aspect of global retail. E-commerce has emerged as an essential tool for sales, marketing, and distribution, driven by advances in communication networks and the widespread use of mobile devices (Cruz, 2021). With the COVID-19 pandemic, companies have increasingly turned to e-commerce to boost digital sales while adapting to lockdowns and social distancing measures (Cavalcante, 2021). It is estimated that e-commerce will reach US$4,117.00 billion in revenue by 2024 and 3.6 billion users by 2029 (Statista, 2024c).

In Portugal, e-commerce is becoming more important in retail due to its convenience and improved consumer experiences. During the COVID-19 pandemic, e-commerce use increased in Portugal, attracting consumers to online shopping, although not as significantly as in some other countries (Plácido et al., 2021; Statista, 2024a; S. Vieira et al., 2020). Consumers still prefer the physical shopping experience, with 30% liking to see items before purchase, and 15% preferring to hold them on the day of purchase (Statista, 2024a).

The adoption of digital technologies and online services in Portugal has been steadily increasing. According to ANACOM (2024), 48.9 % of the Portuguese population aged 16–74 made online purchases in the three months prior to the survey, with 59.3 % having made at least one purchase in the previous 12 months, showing a steady increase compared to 2023. The typical online consumer is under 54 years old, has secondary or higher education, and resides in urban areas, with employees and students being the most active groups. Clothing, footwear, and home-delivered meals are the most purchased physical products, while movies, series, and sports content lead among digital products. These statistics highlight the growing adoption of digital technologies in Portugal and suggest a promising environment for v-commerce, despite the continued cultural preference for physical shopping experiences.

Building on this trend, the AR and VR market in Portugal is also experiencing significant growth, reflecting the population's increasing openness to immersive technologies. The market is projected to reach revenues of US$87.5 million in 2025, with a compound annual growth rate (CAGR 2025-- 2030) of 9.85%, leading to a market volume of US$140.0 million by 2030. VR hardware represents the largest segment, with an

EJABM European Journal of Applied Business and Management
ISSN 2183-5594

anticipated market volume of US $ 23.3 million in 2025. User penetration is expected to reach 50.5% in 2025, remaining at the same level by 2030, corresponding to around 5 million users, with an average revenue per user (ARPU) of US$17. The Portuguese market is increasingly adopting innovative AR and VR applications, particularly in education and tourism, reflecting the country's ongoing digital transformation efforts (Statista, 2025). These developments suggest a favorable environment for v-commerce, where immersive experiences can complement traditional online shopping and enhance consumer engagement.

According to data from Statista (2024c), online shopping is gradually becoming more popular among the Portuguese. In 2023, it became the preferred shopping method for specific product categories, such as electronics and entertainment. It is projected that by 2024, half of Portugal's population will be shopping online.

With the rise and proliferation of mobile technologies and devices, and their use by consumers, e-commerce has adapted to this new reality, and m-commerce (mobile commerce) has emerged (Statista, 2024b). This type of commerce involves buying and selling goods and services via mobile devices (Aamir, 2022). Another growing form of commerce is v-commerce (virtual commerce), which uses virtual environments and immersive technologies—such as virtual reality (VR) and augmented reality (AR)—to conduct commercial activities (Teixeira, 2023).

This research focuses on v-commerce to identify the factors influencing consumer purchase intentions in Portugal. Although v-commerce is a promising form for retail and as a marketing tool, its adoption and impact on consumer behaviour remain to be explored, so more research is needed to understand its potential and implications (Murugaiah et al., 2023; Regt & Barnes, 2019).

The Technology Acceptance Model (TAM) provides a well-established framework for understanding user behavior in digital environments. However, it was initially developed for productivity-oriented technologies rather than immersive contexts (Davis, 1989). In this study, TAM is applied to v-commerce, focusing on perceived usefulness, perceived ease of use, and perceived convenience as factors influencing consumers' attitudes, which in turn affect their purchase intentions. Portuguese consumers, despite increasing online purchases, tend to adopt new forms of commerce cautiously due to trust concerns. Among online shoppers, 81% frequently check the seller's reliability, 77% verify that the website is secure before making a payment, and 86% monitor their bank accounts after a purchase

EJABM European Journal of Applied Business and Management
ISSN 2183-5594

to ensure transactions match their purchases (OECD, 2023). This cautious behavior reflects a general preference for experiential shopping and highlights the importance of trust in shaping consumer intentions in immersive online shopping environments.

The main objective of this study is to identify the factors influencing Portuguese consumers' purchase intentions in v-commerce. A quantitative approach using an online questionnaire and PLS-SEM was employed to evaluate relationships between perceived usefulness, perceived ease of use, perceived convenience, attitude, and purchase intention. The convenience sample included respondents aged 16–74, with diverse educational backgrounds and geographic locations, reflecting a broad representation of Portuguese online shoppers.

The article starts with a brief theoretical overview of v-commerce, TAM (Technology Acceptance Model), and the factors that influence purchase intention. The second section explains the methodology used to achieve the research objective and describes how the data were collected and processed. The third section presents the statistical results from the sample. The fourth section discusses the data in the context of existing literature. Finally, the last section outlines the main conclusions, implications, suggestions, and limitations of the research.

2. Literature Review

This section provides a brief theoretical overview of the concepts underlying the research, including v-commerce, the technology acceptance model (TAM), and the purchase intention factors associated with v-commerce.

2.1. V-commerce

Virtual commerce, also known as v-commerce, is an emerging trend in e-commerce that has the potential to impact consumer behavior. V-commerce utilizes immersive technologies such as virtual reality (VR) and augmented reality (AR) to provide immersive shopping experiences (Luna-Nevarez & McGovern, 2021; Shen et al., 2021; Simonetti & Bigné, 2021).

V-commerce has several advantages, including the possibility for consumers to explore stores virtually, check out products from all angles in real time and in a realistic way, and shop in a realistic environment (Billewar, 2021; Chodak & Ropuszyńska-Surma, 2023).

EJABM European Journal of Applied Business and Management
ISSN 2183-5594

Also, according to Chesney et al. (2017), v-commerce use can address the trust deficit associated with online shopping by offering information-rich environments that facilitate more meaningful interactions. Thus, v-commerce has the potential to bridge the gap between the physical and digital retail environments, making online shopping experiences interactive (Shen et al., 2021). It also offers the following advantages: the ability to present products in their typical environment, the option to view products from distant locations, the opportunity for face-to-face dialogue with the retailer or salesperson, and the chance for people with mobility issues to interact with the product, store, and retailer (Chodak & Ropuszyńska-Surma, 2023). Despite all the advantages, there are also drawbacks, such as consumers may experience side effects (e.g., nausea, vomiting, dizziness, headaches); shopping addiction (compulsion for virtual shopping); control of time flow is very weak; increase in unjustified spending due to less control of consumer behavior in a virtual environment; counterfeiting (Chodak & Ropuszyńska-Surma, 2023).

Although v-commerce is gaining global attention, most research focuses on Asian and North American markets (Günay & Toraman, 2024; Guo & Zhang, 2024). In Portugal, studies on consumer behavior in immersive or virtual commerce remain scarce (Vieira et al., 2020), and only recently have specific investigations on v-commerce emerged (Teixeira, 2023).

According to Jain and Werth (2019) and Pleyers and Poncin (2020), v-commerce can be divided into two types: non-immersive (through a monitor without extra equipment, with interaction through conventional interfaces, such as a mouse, keyboard) and immersive (through equipment such as head-mounted displays controlled by data gloves, controllers, or body movements). This classification provides a clearer understanding of the different technological approaches companies adopt. While non-immersive v-commerce relies on standard devices like computers and smartphones, immersive v-commerce leverages advanced VR technologies to create more engaging, realistic experiences that can enhance consumer involvement and behavioral responses (Pleyers & Poncin, 2020).

In addition to the benefits, v-commerce also faces significant challenges for widespread adoption. The cost of implementing immersive technologies such as VR headsets and AR systems can be a barrier for many businesses, especially in emerging markets. Additionally, concerns related to data privacy and security, particularly on virtual platforms, have been a focus (Chodak & Ropuszyńska-Surma, 2023). These challenges need to be carefully addressed to ensure broader v-commerce adoption.

EJABM European Journal of Applied Business and Management
ISSN 2183-5594

One of the social advantages of v-commerce is its potential to promote inclusion for consumers with special needs, such as those with mobility restrictions. Immersive technologies could allow these consumers to interact with products more effectively, overcoming physical barriers that limit traditional shopping experiences. This inclusive aspect of v-commerce has been highlighted by Chodak and Ropuszyńska-Surma (2023), who emphasize that VR can create an accessible, interactive environment for all consumer types.

In addition to technological and practical aspects, v-commerce can also affect consumers' psychological and social behavior. Immersion in virtual environments can increase consumer confidence in purchases by creating more realistic, interactive experiences, thereby minimizing the perceived risk associated with traditional e-commerce (Chesney et al., 2017). However, it can also lead to impulsive buying behaviors, as the immersive experience can evoke strong emotions and influence purchase decisions (Billewar, 2021).

The acceptance of v-commerce can also be analyzed through theoretical perspectives, such as the Innovation Diffusion Theory (IDT), which suggests that the adoption of new technologies depends on perceptions of relative advantage, compatibility with existing practices, complexity, and trialability (Rogers, 2003). For example, in the context of virtual commerce in the metaverse, Günay and Toraman (2024) developed a model combining IDT and TAM to examine users' acceptance of conducting shopping activities in a metaverse environment. The results show that *relative advantage* positively affects the core TAM variables (perceived usefulness and perceived ease of use). At the same time, complexity was not a significant predictor, and compatibility was positively associated with ease of use. Applying IDT in v-commerce thus provides valuable insights into how consumers evaluate the usefulness, accessibility, and appeal of immersive shopping technologies (Günay & Toraman, 2024). When combined with the Technology Acceptance Model (TAM), IDT offers a more comprehensive framework for understanding v-commerce adoption by integrating perceptions of usefulness and ease of use with broader innovation attributes, such as compatibility and trialability. This integration allows for a deeper examination of how consumers' technological familiarity, cultural attitudes, and perceived risks shape their behavioural intentions toward virtual shopping environments.

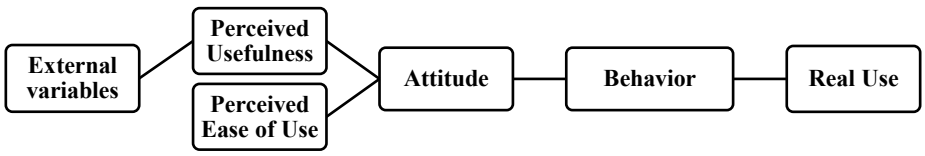
2.2. Technology Acceptance Model

EJABM European Journal of Applied Business and Management
ISSN 2183-5594

The Technology Acceptance Model (TAM), developed by Davis et al. (1989), was created to comprehend the factors influencing general computer acceptance. Since its inception, the model has been utilized for various purposes and domains (Davis et al., 1989).

The Technology Acceptance Model (TAM) (Figure 1) delineates two essential components: perceived usefulness (the individual's belief that engaging with a particular application system will enhance work productivity) and perceived ease of use (the individual's assessment that the specified system requires minimal effort to operate). Utilization is affected by behavioral intention, which, in turn, is influenced by attitude and perceived usefulness. Perceived usefulness exerts a direct influence on the intention to utilize the system and an indirect effect on behavioral intention mediated by attitude. Both perceived usefulness and perceived ease of use concurrently shape attitude. Perceived usefulness can be influenced directly by external beliefs or indirectly through perceived ease of use (Davis et al., 1989). Integrating TAM with additional frameworks, such as UTAUT (Venkatesh et al., 2003) or cultural dimensions (Hofstede, 2001), can provide a more comprehensive understanding of consumer behavior in v-commerce environments, especially among Portuguese consumers, who may differ in their technology adoption patterns from those in other markets.

Figure 1: Technology acceptance model



Source: (Davis et al., 1989)

V-commerce represents a new technological paradigm and an innovative purchasing method, which justifies applying the Technology Acceptance Model (TAM) to clarify consumer acceptance, especially among Portuguese consumers in this study (Luna-Nevarez & McGovern, 2021).

EJABM European Journal of Applied Business and Management
ISSN 2183-5594

2.3. Factors influencing purchase intention

TAM is widely used to investigate e-commerce adoption, with studies indicating that perceived usefulness and perceived ease of use significantly affect e-commerce acceptance (Fedorko et al., 2018; Wang et al., 2021). In the Portuguese context, Vieira et al. (2020) show that trust, price, online experience, and platform usability are important factors influencing consumers' intention to purchase online, highlighting the need to consider local behaviors and preferences in e-commerce studies.

A. Perceived Usefulness

Perceived usefulness refers to an individual's belief that using a technology will benefit them (Worthington, 2021). Phosaard (2012) found that perceived usefulness is positively associated with the intention to purchase in a virtual reality store. Also, Bigne and Maturana (2023) found that usefulness has a positive, direct effect on the intention to use both virtual reality and traditional websites to make tourist reservations. Perceived usefulness was also found to be important in behavioural intentions to use Second Life for business activities (Shen & Eder, 2009). Perceived usefulness is a factor that influences tourists' intention to use VR technology to plan their trips (Disztinger et al., 2017). Also, Hwang et al. (2024) corroborated in their study that usefulness positively affects the attitude towards the use of virtual taster technology. In their study in Saudi Arabia, Alkarney and Almakki (2022) concluded that usefulness has a direct, positive relationship with consumers' intention to use virtual Stores. In a study by Günay and Toraman (2024), perceived usefulness was found to influence attitude towards the metaverse and intention to use this technology. However, these studies focus on contexts outside Portugal, and little research has specifically examined Portuguese consumers, whose digital habits, cultural attitudes, and familiarity with technology may influence perceptions of usefulness differently.

B. Perceived Ease of Use

Perceived ease of use is the belief that using certain technologies will be effortless (Worthington, 2021). Hwang et al. (2024) concluded that ease positively affects attitude towards the use of virtual taster technology. Also, Alkarney and Almakki (2022) found that perceived usefulness influences the intention to use virtual stores. Perceived ease of use significantly influences purchasing attitudes in 3D virtual reality environments (Byram, 2021). The research of Baker et al. (2019) suggests that the utility individuals perceive positively influences their attitudes towards online shopping in a virtual

EJABM European Journal of Applied Business and Management
ISSN 2183-5594

environment. Günay and Toraman (2024) found that perceived ease of use influences attitude towards the metaverse. In Portugal, research indicates that while consumers are generally comfortable with mobile and online technologies, their exposure to immersive VR and AR applications remains limited, suggesting that usability and intuitive design are key factors for adoption in virtual commerce contexts (ANACOM, 2024; Statista, 2025).

C. Perceived Convenience

Perceived convenience refers to the ease, accessibility, and availability of a product or service, including flexibility in terms of time and location (Shehu et al., 2022). Figliozzi (2018) found that perceived convenience in using technology to make a purchase positively affects consumer attitudes. Xue et al. (2020) found that 67% of participants considered perceived convenience in v-commerce a priority. Perceived convenience has a significant impact on purchase intent in a mobile commerce application (El-Ebiary et al., 2021). Convenience benefits significantly and positively influence consumer attitudes towards online group buying (Tingchi Liu et al., 2013). Consumer convenience orientation is related to consumer attitudes towards online stores (Lee, 2007). Time convenience is an important construct that stimulates positive emotions towards mobile retail applications and, consequently, a favourable attitude and intention to use (Chekembayeva et al., 2023). Incorporating perceived convenience in v-commerce research in Portugal is critical, given that mobility, time flexibility, and digital literacy vary across demographic groups, potentially affecting purchase intentions.

Thus, the following research hypotheses are determined.

H1: The favourable attitude towards v-commerce and, consequently, purchase intention is influenced:

a) **Perceived usefulness**
b) **Perceived ease of use**
c) **Perceived convenience**

D. Attitude

Attitude is defined as an individual's feelings about performing a behaviour (Fishbein & Ajzen, 1975). Attitudes towards it influence the intention to use virtual taster technology (Hwang et al., 2024). Dogra et al. (2023) found that customer attitudes positively affect

EJABM European Journal of Applied Business and Management
ISSN 2183-5594

behavioural intentions towards AR-based e-commerce websites. Günay and Toraman (2024) found that attitudes towards the metaverse influence intentions to use it. Attitude towards e-shops positively affects an individual's intention to use them (Alkarney & Almakki, 2022). Baker et al. (2019) found that attitudes towards e-commerce influence consumers' intentions to buy through e-commerce (virtual worlds). Bigne and Maturana (2023) concluded that attitude positively and directly influences the intention to visit a destination on VR and traditional websites, with the effect being greater in VR scenarios.

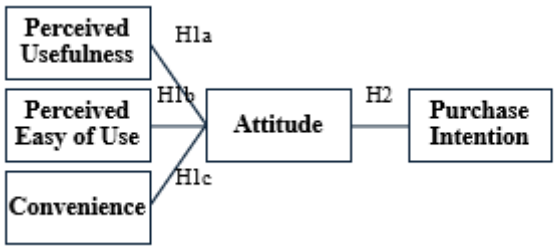
Given the limited research on Portuguese consumers' attitudes towards v-commerce, this study addresses a critical gap in understanding how local cultural and technological factors may moderate these relationships.

Therefore, hypothesis number two is defined.

H2: A positive attitude towards v-commerce will influence consumers to want to buy via v-commerce.

Figure 2 shows the conceptual model to be analysed, based on the research hypotheses.

Figure 2. Conceptual Model



3. Methodology

To validate the hypotheses and conceptual model, this research used a quantitative methodology that allows us to test theories and examine relationships between variables that can be measured using statistical procedures (Creswell & Creswell, 2017). Among the multiple quantitative data collection techniques, a structured online questionnaire was used because it allows us to assess trends, attitudes, and opinions within a population, or to examine links between variables (Creswell & Creswell, 2017).

EJABM European Journal of Applied Business and Management
ISSN 2183-5594

An online questionnaire was administered and distributed via social media from June to August 2024. This questionnaire was developed in two stages. The first aimed to determine the sociodemographic characteristics of the Portuguese population through multiple-choice questions. The second sought to ascertain respondents' opinions using Likert scales (1 = “Strongly Disagree” and 5 = “Strongly Agree”) on the variables under analysis. The questionnaire items were based on previously validated scales and were carefully translated into Portuguese to maintain linguistic and cultural accuracy (Appendix 1). A pilot study was conducted with a small group of respondents to evaluate clarity, understanding, and the relevance of the items.

Since we wanted to use partial least squares structural equation modelling (PLS-SEM), we attempted to determine the minimum sample size required for this type of statistical procedure using SmartPLS v4.1.0.2 (Ringle et al., 2024).. Hair Jr. et al. (2021) showed that the results are robust even when the data are normal and the sample size is small. Chin (1998) also noted that this method should be used when the sample size is less than 200 observations. Jhantasana (2023) recommends a larger sample size of at least 50 to achieve adequate power. G*Power 3.1 was used to analyse the minimum sample size, as mentioned by the authors (Hair Jr. et al., 2021; Ringle et al., 2014), parameters were f^2 (0.15), probability of error (0.05), statistical power (0.8), and degree of freedom (1). The number of predictors was set at 4, i.e., the number of links between independent and dependent variables. These parameters required 88 observations. We obtained 100 responses, which exceeds the value calculated in G*Power. Although the sample size exceeds the minimum requirements for PLS-SEM, it is a convenience sample of Portuguese consumers, which may limit the generalizability of the results. Consequently, findings should be interpreted cautiously, as they may not fully reflect the broader Portuguese population in terms of age, income, or technological familiarity.

PLS-SEM was employed to test the conceptual model and research hypotheses, as it is particularly suitable for exploratory studies involving complex relationships between latent variables and relatively small sample sizes. This method accommodates non-normal data and allows simultaneous estimation of multiple paths. Construct reliability and validity were evaluated using Cronbach’s alpha, composite reliability, and average variance extracted (AVE). Discriminant validity was assessed using the Fornell-Larcker criterion and the heterotrait-monotrait ratio (HTMT). Bootstrapping with 5,000 resamples

EJABM European Journal of Applied Business and Management
ISSN 2183-5594

was conducted to determine the significance of path coefficients, providing robust statistical inference (Hair Jr. et al., 2021; Henseler et al., 2015).

Overall, this methodology offers a rigorous framework to examine the factors influencing Portuguese consumers' purchase intentions in v-commerce while transparently acknowledging the limitations of convenience sampling and external validity.

4. Results

This section presents the results of the analysis of the Portuguese population sample data.

A. Sociodemographic characterization of the sample

Table 1 shows that most of the sample is female, aged 25-64, has a university degree, is from the north of Portugal, and is an employee. This sociodemographic profile suggests that the findings may predominantly reflect the attitudes and behaviors of educated working-age consumers in Northern Portugal. Therefore, caution should be exercised when generalizing these results to other regions or age cohorts within Portugal.

Table 1. Sociodemographic characterization of the sample

Gender	**N**	**%**
Female	78	78,0%
Male	22	22,0%
Age group	**N**	**%**
<15 years	1	1,0%
15-24 years	32	32,0%
25-64 years	64	64,0%
65 years or more	3	3,0%
Academic qualifications	**N**	**%**
Doctorate	5	5,0%
Basic education - second cycle	1	1,0%
Basic education - third cycle	3	3,0%
Post-secondary education	8	8,0%
Secondary education	8	8,0%
Bachelor's degree	55	55,0%
Masters	20	20,0%
Region	**N**	**%**
Center	13	13,0%
Lisbon	10	10,0%
North	77	77,0%
Professional occupation	**N**	**%**
Unemployed/retired/housewife	7	7,0%
Employee	59	59,0%
Entrepreneur	1	1,0%
Student	24	24,0%
Other	1	1,0%

EJABM European Journal of Applied Business and Management
ISSN 2183-5594

Self-employed	3	3,0%
Student worker	5	5,0%

B. Factors influencing purchase intention

To validate the research hypotheses and conceptual model, a PLS-SEM analysis was conducted. The assumptions of Hair Jr. et al. (2021) are that the process starts with an evaluation of the measurement model and ends with the evaluation of the structural model and hypothesis testing.

C. Measurement model evaluation

In this evaluation, the factor loadings were analysed, and, according to Hair Jr. et al. (2021), they must be higher than 0.7 per item. However, Chin (1998) suggests that a value of 0.50 is acceptable. In this investigation, all the items had values higher than 0.5. Reliability, convergent, and discriminant validity were then analysed (Table 2). Regarding reliability, Cronbach's alpha (α) and composite reliability (CC) were used, which must be > 0.7 to be acceptable or > 0.8 to be very satisfactory. Thus, all the constructs were found to be reliable. To verify convergent validity, the average variance extracted (AVE) was used, with a minimum acceptable value of 0.5 or higher, indicating that the construct explains at least 50% of the variance in its indicators. Here, too, the results of this study are validated. These results indicate that the measurement model is robust, ensuring that the constructs accurately capture the intended theoretical dimensions. This reliability and validity support the credibility of the subsequent structural model analysis.

Table 2. Internal reliability, convergent, and discriminant validity

	Cronbach's alpha	**Composite reliability (rho_a)**	**Composite reliability (rho_c)**	**Average variance extracted (AVE)**
AT	0,932	0,934	0,952	0,831
CO	0,892	0,900	0,925	0,756
EOU	0,885	0,890	0,911	0,597
PI	0,925	0,927	0,953	0,870
PU	0,914	0,919	0,936	0,745

Note: AT (attitude); CO (convenience); EOU (perceived ease of use), PI (purchase intention), PU (perceived usefulness).

Finally, discriminant validity was carried out using the Fornell-Larcker criterion and the heterotrait-monotrait correlation ratio (HTMT). Table 3 shows that all AVEs exceed their

EJABM European Journal of Applied Business and Management
ISSN 2183-5594

corresponding correlation coefficients with other variables, indicating good discriminant validity. This confirms that each construct is distinct, allowing meaningful interpretation of the relationships between attitude, perceived usefulness, perceived ease of use, convenience, and purchase intention.

Table 3. Fornell-Larcker criteria

	AT	CO	EOU	PI	PU
AT	0,912				
CO	0,691	0,870			
EOU	0,560	0,434	0,772		
PI	0,721	0,780	0,404	0,933	
PU	0,723	0,837	0,471	0,764	0,863

Note: AT (attitude); CO (convenience); EOU (perceived ease of use), PI (purchase intention), PU (perceived usefulness).

D. Structural model evaluation and hypothesis testing

At this stage, PLS bootstrapping resampling was performed using 5000 samples, as suggested by Hair Jr. et al. (2021). Table 4 shows the results of the structural model evaluation and hypothesis testing.

Table 4. Structural model evaluation and hypothesis testing

	Path coefficients	VIF	f-square	T statistics	P values
AT -> PI	0,721	1,000	1,085	13,827	0,000
CO -> AT	0,251	3,355	0,047	0,870	0,384
EOU -> AT	0,269	1,294	0,141	2,378	0,017
PU -> AT	0,386	3,498	0,107	1,667	0,096
		R-square		**Q²predict**	
AT		0,603		0,562	
PI		0,520		0,531	

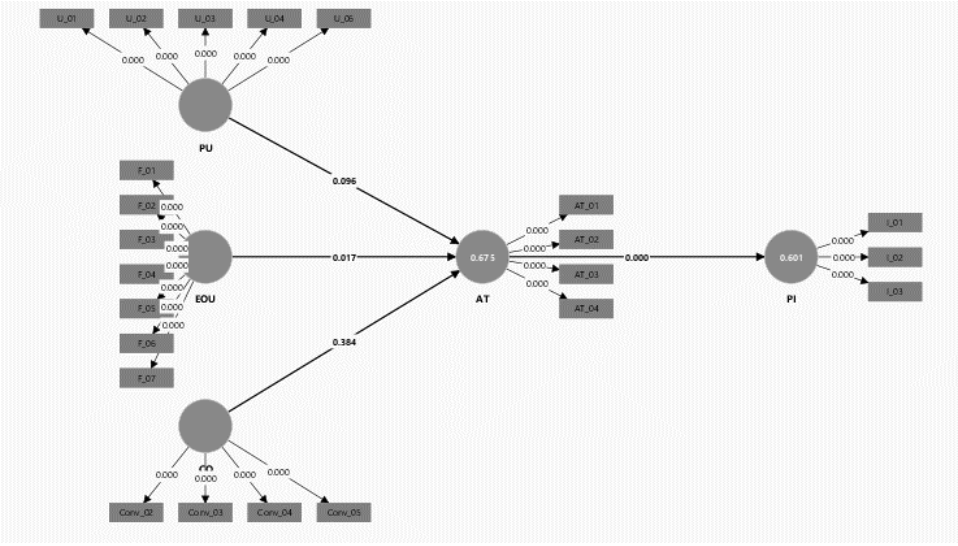
Note: AT (attitude); CO (convenience); EOU (perceived ease of use), PI (purchase intention), PU (perceived usefulness).

Looking at Table 4, all the VIF values are less than 5, indicating satisfactory multicollinearity. Cohen's f^2 was utilized, with values greater than 0.02, 0.15, and 0.35 representing small, medium, and large effect sizes, respectively (Cohen, 1988). The analysis showed that attitude has a small effect on intention, while convenience has a negligible effect on attitude. Perceived ease of use and attitude have a moderate effect, while attitude and intention have a significant effect. The R^2 values of 0.02, 0.13, and 0.26 indicate weak, moderate, and substantial levels, respectively. The Q^2 values above

EJABM European Journal of Applied Business and Management
ISSN 2183-5594

zero for a specific variable indicate the predictive relevance of the path model for that variable (Chin, 1998; Cohen, 1988; Dolce et al., 2017). Looking at the values obtained in the study, R^2 for intention is 0.603, and for attitude is 0.520; i.e., intention is explained by 60.3% of the variance in purchase intention, and attitude is explained by 52.0% of the variance in the constructs (convenience, perceived ease of use, and perceived usefulness). Regarding Q2, these values were found to be greater than zero, indicating predictive relevance. The results of the structural model indicate that attitude is a strong predictor of purchase intention, whereas perceived ease of use exerts a moderate influence on attitude. Although perceived usefulness and convenience exhibit positive trends, they did not reach statistical significance in this sample, potentially reflecting cultural or technological characteristics specific to Portuguese consumers. The substantial R^2 values suggest that the model explains a meaningful proportion of variance in both attitude and purchase intention, while Q^2 values above zero confirm the model's predictive relevance for this population, reinforcing the applicability of TAM constructs in the context of v-commerce in Portugal. In short, Figure 2 shows the conceptual model obtained from PLS-SEM bootstrapping.

Figure 2. Conceptual model – PLS-SEM bootstrapping



Overall, these findings offer preliminary empirical support for the key determinants of purchase intention in Portuguese v-commerce contexts, underscoring the critical role of attitude and perceived ease of use. The non-significant effects of perceived usefulness and convenience indicate that cultural or contextual factors may moderate these relationships, highlighting areas for further investigation.

EJABM European Journal of Applied Business and Management
ISSN 2183-5594

5. Discussion

This section discusses the findings from the PLS-SEM analysis, considering the proposed hypotheses and relevant theoretical frameworks.

Analysing **H1a - Favourable attitude towards v-commerce and, consequently, purchase intention are influenced by perceived usefulness (β = 0.386; t = 1.667; p-value = 0.096).** Although this has a positive effect, it is not statistically significant, so this hypothesis is not supported. This positive trend aligns with previous studies in the literature (Alkarney & Almakki, 2022; Bigne & Maturana, 2023; Disztinger et al., 2017; Günay & Toraman, 2024; Hwang et al., 2024; Phosaard, 2012; Shen & Eder, 2009), which suggest that perceived usefulness generally contributes to favourable attitudes toward virtual commerce. The lack of statistical significance in this study may reflect limited familiarity among Portuguese consumers with immersive technologies, such as virtual reality (VR) and augmented reality (AR), which could moderate their perceptions of usefulness. In line with Phosaard (2012) and Shen and Eder (2009), consumers' attitudes toward virtual commerce tend to be influenced by their prior experiences and by how relevant they perceive the technology to be in their everyday lives. Given Portugal's moderate level of digital maturity, this may lead to a more cautious approach to adoption.

This finding suggests that while Portuguese consumers acknowledge potential benefits of v-commerce, they may not yet perceive these advantages as sufficiently tangible or relevant to their everyday shopping habits. This interpretation aligns with the Innovation Diffusion Theory, which emphasizes that the perceived relative advantage of an innovation must be evident for adoption to occur (Rogers, 2003). Given that v-commerce remains an emerging concept in Portugal, its perceived usefulness may be constrained by limited exposure, low VR device penetration, and concerns about security and reliability (Teixeira, 2023). Additionally, cultural shopping preferences that favor social and tactile experiences may reduce the perceived utility of virtual alternatives (Vieira et al., 2020). This interpretation aligns with Dwivedi et al. (2023), who highlight that technological readiness acts as a moderating factor in technology acceptance models, influencing perceptions of usefulness and ease of use. Based on this, the observed positive yet insignificant relationship may indicate an early stage of curiosity rather than full commitment.

EJABM European Journal of Applied Business and Management
ISSN 2183-5594

Regarding **H1b - The favourable attitude towards v-commerce and, consequently, purchase intention are influenced by perceived ease of use (β = 0.269; t = 1.294; p-value = 0.017). This** has a positive effect on intention and is statistically significant, supporting the hypothesis. This finding aligns with the following authors (Alkarney & Almakki, 2022; Baker et al., 2019; Byram, 2021; Günay & Toraman, 2024; Hwang et al., 2024). This result highlights that ease of use is a key driver of Portuguese consumers' adoption of v-commerce. Simplifying navigation and reducing interaction complexity can therefore have a tangible impact on purchase intention, confirming the relevance of the TAM in the local context. This is particularly relevant in markets with moderate digital maturity, such as Portugal, where reducing perceived effort can accelerate adoption.

The significant positive relationship between perceived ease of use and purchase intention suggests that when consumers find v-commerce platforms intuitive and easy to navigate, they are more likely to engage in purchases. This interpretation is supported by prior research that emphasizes ease of use as a critical determinant of technology adoption and purchase behavior in virtual environments (Baker et al., 2019; Hwang et al., 2024). Therefore, companies should prioritize user-friendly design and seamless interactions to enhance consumer engagement, confirming the relevance of the TAM in this context.

This result reinforces TAM's core assumption that technology adoption depends strongly on perceived simplicity and intuitiveness of the interface. In early adoption contexts, ease of use can encourage initial experimentation among consumers unfamiliar with immersive technologies. The findings of Voicu et al. (2023) indicate that usability perceptions, along with factors such as fit confidence and utilitarian value, significantly influence continued usage intention of AR apps. This suggests that interface design, accessibility, and platform ergonomics play decisive roles in shaping favorable attitudes. Retailers should therefore focus on creating user-friendly environments that minimize friction, ensure smooth navigation, and provide practical benefits, as these elements are critical for enhancing consumer engagement and driving adoption.

Looking at **H1c - Favourable attitude towards v-commerce and, consequently, purchase intention is influenced by perceived convenience** (β = 0.251; t = 3.355; p-value = 0.384), it also has a positive effect, but as p-value>0.05, it is not statistically significant. Therefore, H1c is not supported. This positive result is supported by the following authors: Chekembayeva et al. (2023); El-Ebiary et al. (2021); Figliozzi (2018); Lee (2007); and Tingchi Liu et al. (2013); Xue et al. (2020). Although perceived

EJABM European Journal of Applied Business and Management
ISSN 2183-5594

convenience shows a positive trend, its non-significance may reflect Portuguese consumers' relatively low reliance on virtual shopping convenience compared to other markets. This interpretation suggests that cultural preferences for in-store inspection and tactile experiences may reduce the perceived impact of convenience on attitude and purchase intention. Therefore, strategies that combine convenience with immersive, trust-building features in v-commerce platforms could be more effective.

Although perceived convenience is traditionally considered an important factor in e-commerce, this study found that it was not statistically significant in the context of v-commerce. One plausible explanation is the additional effort required to engage with immersive technologies, such as the need for specialized devices (e.g., VR headsets) and the complexity of navigating virtual environments. Xue et al. (2020) highlight that while consumers value convenience in v-commerce, technological barriers and high expectations often limit its impact on adoption. In contrast, El-Ebiary et al. (2021) demonstrate that convenience significantly influences purchase intention in mobile commerce, where such barriers are minimal and the shopping process is streamlined.

The non-significant findings for H1a and H1c may also reflect cultural and infrastructural factors in Portugal. Consumers may be more inclined toward physical shopping experiences, which involve tangible interaction with products. The moderate digital readiness in Portugal, coupled with the relatively late diffusion of immersive technologies, could explain the weaker relationship between perceived usefulness and convenience, suggesting that adoption is still in its early stages.

Finally, analysing **H2 - A positive attitude towards v-commerce will influence consumers to buy via v-commerce (β = 0.721; t = 1.000; p-value = 0.000)**, the effect is positive and statistically significant, thus supported in this study. This result aligns with Alkarney & Almakki (2022), Baker et al. (2019), Bigne & Maturana (2023), Ceyhan Günay & Toraman (2024), Dogra et al. (2023), and Hwang et al. (2024). The strong support for H2 highlights the critical role of fostering positive consumer attitudes toward v-commerce. To accelerate adoption, companies should emphasize clear benefits, build trust in virtual environments, and deliver immersive experiences that resonate with consumer values. Prior research reinforces this perspective: Alkarney and Almakki (2022) and Hwang et al. (2024) found that attitude acts as a key mediating factor in technology adoption, indicating that a favorable attitude strongly drives intention to use emerging technologies. This strong effect confirms that attitude is a critical mediator in

EJABM European Journal of Applied Business and Management
ISSN 2183-5594

the relationship between TAM constructs and purchase intention in v-commerce. It underscores the importance of enhancing positive user experiences, trust, and engagement to influence Portuguese consumers' behavioral intentions. In practice, managers should focus on designing intuitive and immersive platforms that foster positive attitudes, as these are directly linked to purchase likelihood.

Overall, the discussion suggests that while TAM constructs such as perceived ease of use and attitude are robust predictors of purchase intention, perceived cultural and technological factors in Portugal may moderate usefulness and convenience. This highlights the importance of contextualizing global models, such as TAM, when applying them to local markets and guides future research on consumer behavior in European v-commerce contexts.

The strong support for H2 highlights the crucial role of fostering positive consumer attitudes toward v-commerce. To drive adoption, companies should emphasize clear benefits, build trust, and offer immersive experiences that align with consumer values. Previous research (Alkarney & Almakki, 2022; Hwang et al., 2024) confirms that attitude is a key mediator in technology adoption, with a favorable attitude strongly influencing the intention to use emerging technologies. This reinforces that positive user experiences, trust, and engagement are essential to shaping Portuguese consumers' purchase intentions.

These findings support the TAM and IDT frameworks, demonstrating that positive attitudes toward technological innovations drive behavioral intentions. For Portuguese consumers, perceiving v-commerce as enjoyable, accessible, and aligned with their values significantly increases their willingness to purchase. This suggests that emotional engagement and trust are key drivers of purchase behavior, aligning with emerging European evidence that digital retail success depends not only on functionality but also on affective experience and social interaction (Günay & Toraman, 2024).

6. Conclusion

Considering the objective of this research, which was to identify the factors in v-commerce that influence consumer purchase intention, only ease was found to be corroborated in this sample as a factor that influences attitude towards v-commerce and, consequently, purchase intention. This study also found that attitude towards v-commerce

EJABM European Journal of Applied Business and Management
ISSN 2183-5594

positively influences the purchase intention of Portuguese consumers. These findings highlight the importance of designing v-commerce platforms that are intuitive, user-friendly, and that reduce cognitive effort. Managers can leverage this insight by investing in user experience improvements, simplified navigation, and immersive features that facilitate easy interaction, thereby increasing purchase intentions.

Despite the results obtained, this research has had some limitations, namely the non-representativeness of the Portuguese population, the failure to use all the variables that may influence attitude towards v-commerce, and the lack of studies directly related to the subject. Future research could address these limitations by employing quota or stratified sampling to achieve a more representative Portuguese sample, conducting comparative studies across different countries or European markets, and incorporating additional variables, such as trust, enjoyment, social influence, or technological readiness. Longitudinal studies could also examine how attitudes and purchase intentions evolve as consumers gain more experience with v-commerce.

From a practical perspective, the results offer valuable guidance for managers and marketers. Companies aiming to implement v-commerce strategies in Portugal should focus on improving ease of use and consumer familiarity with immersive technologies, investing in intuitive interfaces and educational marketing. Demonstrating straightforward utility and convenience benefits can foster positive attitudes, while trial experiences and practical customer support can facilitate adoption and engagement.

From a theoretical perspective, this research reinforces the applicability of TAM in emerging digital contexts while suggesting the integration of complementary frameworks, such as Innovation Diffusion Theory, to capture better external and social factors that affect adoption. Future studies could explore longitudinal data and expand the model to include variables such as trust, perceived enjoyment, social influence, and consumer empowerment, providing deeper insights into the evolving nature of consumer behavior toward v-commerce across cultural and technological settings.

References

Aamir, S. (2022). *Mobile Commerce (mCommerce)*. https://www.elgaronline.com/display/book/9781800377486/b-9781800377486.mobile.commerce.xml

EJABM European Journal of Applied Business and Management
ISSN 2183-5594

Alkarney, W., & Almakki, R. (2022). Factors Affecting the Intention to Use Virtual Stores: Perspectives of Consumers in Saudi Arabia. *Mobile Information Systems*, *2022*, 1–24. https://doi.org/10.1155/2022/8340406

ANACOM. (2024). *Comércio eletrónico em Portugal e na União Europeia*. ANACOM. https://www.anacom.pt/streaming/Comercio_Eletronico_2024.pdf?contentId=1802554&field=ATTACHED_FILE

Baker, E. W., Hubona, G. S., & Srite, M. (2019). Does "being there" matter? The impact of web-based and virtual world's shopping experiences on consumer purchase attitudes. *Information & Management*, *56*(7), 103153.

Barkhi, R., Belanger, F., & Hicks, J. (2008). A Model of the Determinants of Purchasing from Virtual Stores. *Journal of Organizational Computing and Electronic Commerce*, *18*(3), 177–196. https://doi.org/10.1080/10919390802198840

Bigne, E., & Maturana, P. (2023). Does Virtual Reality Trigger Visits and Booking Holiday Travel Packages? *Cornell Hospitality Quarterly*, *64*(2), 226–245. https://doi.org/10.1177/19389655221102386

Billewar, S. (2021). E-Commerce Shopping Gets Real: The Rise of Interactive Virtual Reality. *Bioscience Biotechnology Research Communications*, *14*, 130–132. https://doi.org/10.21786/bbrc/14.5/25

Byram, A. (2021). A study on customer perception and attitude towards 3d virtual reality shopping. *Information Technology in Industry*, *9*(1), 1329–1342.

Cavalcante, I. C. S. (2021). Análise do comércio eletrônico para o empreendedorismo na pandemia da Covid-19. *Revista Brasileira de Administração Científica*, *12*(3), Article 3. https://doi.org/10.6008/CBPC2179-684X.2021.003.0001

Chekembayeva, G., Garaus, M., & Schmidt, O. (2023). The role of time convenience and (anticipated) emotions in AR mobile retailing application adoption. *Journal of Retailing and Consumer Services*, *72*, 103260. https://doi.org/10.1016/j.jretconser.2023.103260

Chesney, T., Chuah, S.-H., Dobele, A., & Hoffmann, R. (2017). Information richness and trust in V-commerce: Implications for services marketing. *Journal of Services Marketing*, *31*. https://doi.org/10.1108/JSM-02-2015-0099

Childers, T., Carr, C., Peck, J., & Carson, S. (2001). Hedonic and Utilitarian Motivations for Online Retail Shopping Behavior. *Journal of Retailing*, *77*, 511–535. https://doi.org/10.1016/S0022-4359(01)00056-2

Chin, W. W. (1998). The partial least squares approach for structural equation modeling. In *Modern methods for business research* (pp. 295–336). Lawrence Erlbaum Associates Publishers.

Chodak, G., & Ropuszyńska-Surma, E. (2023). Virtual Reality and Artificial Intelligence in e-Commerce. In D. Garg, V. A. Narayana, P. N. Suganthan, J. Anguera, V. K. Koppula, & S. K. Gupta (Eds.), *Advanced Computing* (pp. 328–340). Springer Nature Switzerland. https://doi.org/10.1007/978-3-031-35644-5_26

Cohen, J. (1988). *Statistical Power Analysis for the Behavioral Sciences* (2nd ed.). Routledge. https://doi.org/10.4324/9780203771587

Creswell, J. W., & Creswell, J. D. (2017). *Research Design: Qualitative, Quantitative, and Mixed Methods Approaches*. SAGE Publications.

Cruz, W. L. de M. (2021). Crescimento do e-commerce no Brasil: Desenvolvimento, serviços logísticos e o impulso da pandemia de Covid-19. *GeoTextos*. https://doi.org/10.9771/geo.v17i1.44572

Davis, F. D. (1989). Perceived Usefulness, Perceived Ease of Use, and User Acceptance of Information Technology. *MIS Quarterly*, *13*(3), 319–340. https://doi.org/10.2307/249008

Davis, F. D., Bagozzi, R. P., & Warshaw, P. R. (1989). User Acceptance of Computer Technology: A Comparison of Two Theoretical Models. *Management Science*, *35*(8), 982–1003.

Disztinger, P., Schlögl, S., & Groth, A. (2017). *Technology Acceptance of Virtual Reality for Travel Planning*. 255–268. https://doi.org/10.1007/978-3-319-51168-9_19

Dolce, P., Esposito Vinzi, V., & Lauro, C. (2017). Predictive Path Modeling Through PLS and Other Component-Based Approaches: Methodological Issues and Performance

EJABM European Journal of Applied Business and Management
ISSN 2183-5594

Evaluation. In *Partial Least Squares Path Modeling: Basic Concepts, Methodological Issues and Applications* (pp. 153–172). https://doi.org/10.1007/978-3-319-64069-3_7

Dwivedi, Y. K., Hughes, L., Wang, Y., Alalwan, A. A., Ahn, S. J. (Grace), Balakrishnan, J., Barta, S., Belk, R., Buhalis, D., Dutot, V., Felix, R., Filieri, R., Flavián, C., Gustafsson, A., Hinsch, C., Hollensen, S., Jain, V., Kim, J., Krishen, A. S., … Wirtz, J. (2023). Metaverse marketing: How the metaverse will shape the future of consumer research and practice. *Psychology & Marketing*, *40*(4), 750–776. https://doi.org/10.1002/mar.21767

El-Ebiary, Y. A. B., Pathmanathan, P. R., Tarshany, Y. M. A., Jusoh, J. A., Aseh, K., Al Moaiad, Y., Al-Kofahi, M., Pande, B., & Bamansoor, S. (2021). Determinants of customer purchase intention using Zalora mobile commerce application. *2021 2nd International Conference on Smart Computing and Electronic Enterprise (ICSCEE)*, 159–163. https://ieeexplore.ieee.org/abstract/document/9497995/

Fedorko, I., Bacik, R., & Gavurova, B. (2018). Technology acceptance model in e-commerce segment. *Management & Marketing*, *13*(4), 1242–1256. https://doi.org/10.2478/mmcks-2018-0034

Figliozzi, E. (2018). *From e-commerce to v-commerce: An empirical study on consumers acceptance in Brazil* [PhD Thesis]. https://bibliotecadigital.fgv.br/dspace/handle/10438/25756

Fishbein, M., & Ajzen, I. (1975). *Belief, attitude, intention and behaviour: An introduction to theory and research* (Vol. 27).

Günay, A. C., & Toraman, Y. (2024). *USER ACCEPTANCE OF VIRTUAL COMMERCE ON METAVERSE: INSIGHTS FROM INNOVATION DIFFUSION THEORY (IDT) AND TECHNOLOGY ACCEPTANCE MODEL (TAM)*. *11*, 23–42.

Hair Jr., J. F., Hult, G. T. M., Ringle, C. M., Sarstedt, M., Danks, N. P., & Ray, S. (2021). *Partial Least Squares Structural Equation Modeling (PLS-SEM) Using R: A Workbook*. Springer Nature. https://doi.org/10.1007/978-3-030-80519-7

Henseler, J., Ringle, C. M., & Sarstedt, M. (2015). A new criterion for assessing discriminant validity in variance-based structural equation modeling. *Journal of the Academy of Marketing Science*, *43*(1), 115–135. https://doi.org/10.1007/s11747-014-0403-8

Hofstede, G. (2001). Culture's Consequences: Comparing Values, Behaviors, Institutions, and Organizations Across Nations. *Culture's Consequences: Comparing Values, Behaviors, Institutions, and Organizations Across Nations*. https://doi.org/10.1016/S0005-7967(02)00184-5

Hwang, C., Jin, B., Song, L., & Feng, J. (2024). Factors influencing older adults' intention to use virtual fitting room technology during the COVID-19 pandemic. *Journal of Fashion Marketing and Management: An International Journal*, *28*(3), 444–459. https://doi.org/10.1108/JFMM-10-2022-0210

Jain, S., & Werth, D. (2019). Current State of Mixed Reality Technology for Digital Retail: A Literature Review. In F. F.-H. Nah & K. Siau (Eds.), *HCI in Business, Government and Organizations. eCommerce and Consumer Behavior* (pp. 22–37). Springer International Publishing. https://doi.org/10.1007/978-3-030-22335-9_2

Jhantasana, C. (2023). Should A Rule of Thumb be used to Calculate PLS-SEM Sample Size. *Asia Social Issues*, *16*(5), Article 5. https://doi.org/10.48048/asi.2023.254658

Lee, B. C. Y. (2007). Consumer attitude toward virtual stores and its correlates. *Journal of Retailing and Consumer Services*, *14*(3), 182–191. https://doi.org/10.1016/j.jretconser.2006.07.001

Luna-Nevarez, C., & McGovern, E. (2021). The Rise of the Virtual Reality (VR) Marketplace: Exploring the Antecedents and Consequences of Consumer Attitudes toward V-Commerce. *WCBT Faculty Publications*. https://doi.org/10.1080/15332861.2021.1875766

Murugaiah, S., Viswanathan, R., & Jageerkhan, M. N. (2023). Can the V-Commerce be an Influencing Factors Towards Consumer Buying Behaviour. *Journal of Law and Sustainable Development*, *11*(6), e1199–e1199. https://doi.org/10.55908/sdgs.v11i6.1199

EJABM European Journal of Applied Business and Management
ISSN 2183-5594

OECD. (2023). *Digital Financial Literacy in Portugal: Relevance, Evidence and Provision*. https://www.oecd.org/finance/financial-education/digital-financial-literacy-in-portugal-relevance-evidence-and-provision.pdf

Phosaard, S. (2012). *The effects of interface factors and store environment on consumers' purchase and revisit intention in an online virtual reality store* [PhD Thesis, Chulalongkorn University]. http://cuir.chula.ac.th/dspace/handle/123456789/52996?src=%2Fdspace%2Fbrowse%3Ftype%3Dsubject%26sort_by%3D1%26order%3DASC%26rpp%3D20%26etal%3D-1%26value%3DElectronic%2Bcommerce%26starts_with%3DC%26brw_total%3D15%26brw_pos%3D0

Plácido, B., Proença, S., Moreira, D., Boução, L., Branco, F., & Au-Yong-Oliveira, M. (2021). E-commerce During the COVID-19 Pandemic: An Exploratory Study Involving Portuguese Consumers. In Á. Rocha, H. Adeli, G. Dzemyda, F. Moreira, & A. M. Ramalho Correia (Eds.), *Trends and Applications in Information Systems and Technologies* (pp. 422–434). Springer International Publishing. https://doi.org/10.1007/978-3-030-72654-6_41

Pleyers, G., & Poncin, I. (2020). Non-immersive virtual reality technologies in real estate: How customer experience drives attitudes toward properties and the service provider. *Journal of Retailing and Consumer Services*, *57*(C). https://ideas.repec.org//a/eee/joreco/v57y2020ics0969698920308274.html

Regt, A., & Barnes, S. J. (2019). V-Commerce in Retail: Nature and Potential Impact. *Progress in IS*, 17–25.

Ringle, C. M., Wende, S., & Becker, J. M. (2024). SmartPLS 4. Boenningstedt. *SmartPLS GmbH*.

Rogers, E. M. (2003). *Diffusion of Innovations, 5th Edition*. Simon and Schuster.

Shehu, K. L., Ahmad, A., Ibrahim, U. Y., Baraza, F. A., & Toro, A. S. (2022). Factors Affecting Intention to Use Point of Sales (POS) Terminal Among Academic Staff of Some Tertiary Institutions in Bachi State. *Journal of Entrepreneurship and Innovation Research*, *1*(2).

Shen, B., Tan, W., Guo, J., Zhao, L., & Qin, P. (2021). How to Promote User Purchase in Metaverse? A Systematic Literature Review on Consumer Behavior Research and Virtual Commerce Application Design. *Applied Sciences*, *11*(23), Article 23. https://doi.org/10.3390/app112311087

Shen, J., & Eder, L. (2009). Exploring intentions to use virtual worlds for business. *Journal of Electronic Commerce Research*, *10*, 94–103.

Simonetti, A., & Bigné, E. (2021, January 1). *E-commerce vs V-commerce Behavioral: Insights from a Shopping Task*. https://doi.org/10.1037/tms0000056

Statista. (2024a). *E-commerce in Portugal*. Statista. https://www.statista.com/topics/8447/e-commerce-in-portugal/

Statista. (2024b). *E-commerce worldwide*. https://www.statista.com/topics/871/online-shopping/

Statista. (2024c). *eCommerce—Worldwide | Statista Market Forecast*. Statista. https://www.statista.com/outlook/emo/ecommerce/worldwide

Statista. (2025). *AR & VR - Portugal | Statista Market Forecast*. Statista. http://frontend.xmo.prod.aws.statista.com/outlook/amo/ar-vr/portugal?utm_source=chatgpt.com

Teixeira, S. (2023). Research consensus about Portuguese consumer's purchase intention through v-commerce: Delphi method. *European Journal of Applied Business and Management*, *9*(2), Article 2. https://nidisag.isag.pt/index.php/IJAM/article/view/697

Thomas-Francois, K., & Somogyi, S. (2021). Consumers' intention to adopt virtual grocery shopping: Do technological readiness and the optimisation of consumer learning matter? *International Journal of Retail & Distribution Management*, *50*(5), 638–657. https://doi.org/10.1108/IJRDM-06-2020-0206

Tingchi Liu, M., Brock, J. L., Cheng Shi, G., Chu, R., & Tseng, T. (2013). Perceived benefits, perceived risk, and trust. *Asia Pacific Journal of Marketing and Logistics*, *25*(2), 225–248. https://doi.org/10.1108/13555851311314031

Venkatesh, V., Morris, M. G., Davis, G. B., & Davis, F. D. (2003). User Acceptance of Information Technology: Toward a Unified View. *MIS Quarterly*, *27*(3), 425–478. https://doi.org/10.2307/30036540

EJABM European Journal of Applied Business and Management
ISSN 2183-5594

Vieira, J., Frade, R., Ascenso, R., Prates, I., & Martinho, F. (2020). Generation Z and Key-Factors on E-Commerce: A Study on the Portuguese Tourism Sector. *Administrative Sciences*, *10*(4), 103. https://doi.org/10.3390/admsci10040103

Vieira, S., Clímaco, M. I. N., & Larguinho, M. M. C. (2020). *Fatores que influenciam a intenção de compra de online groceries em Portugal*. https://www.semanticscholar.org/paper/Fatores-que-influenciam-a-inten%C3%A7%C3%A3o-de-compra-de-em-Vieira-Cl%C3%ADmaco/5c794d6683d366b027683d392c7d607bbadd73b6

Voicu, M., Sîrghi, N., & Toth, D. (2023). Consumers' Experience and Satisfaction Using Augmented Reality Apps in E-Shopping: New Empirical Evidence. *Applied Sciences*, *13*, 9596. https://doi.org/10.3390/app13179596

Wang, C., Liu, T., Wen, D., Li, D., Vladislav, G., & Zhu, Y. (2021). The Impact of International Electronic Commerce on Export Trade: Evidence from China. *Journal of Theoretical and Applied Electronic Commerce Research*, *16*, 2579–2593. https://doi.org/10.3390/jtaer16070142

Worthington, A. K. (2021). *Application of the Technology Acceptance Model*. https://ua.pressbooks.pub/persuasiontheoryinaction/chapter/application-of-the-technology-acceptance-model/

Xue, L., Parker, C. J., & Hart, C. A. (2020). How to Engage Fashion Retail with Virtual Reality: A Consumer Perspective. In T. Jung, M. C. tom Dieck, & P. A. Rauschnabel (Eds.), *Augmented Reality and Virtual Reality: Changing Realities in a Dynamic World* (pp. 23–35). Springer International Publishing. https://doi.org/10.1007/978-3-030-37869-1_3

Appendix

Appendix 1. Constructs vs Items

Constructs	**Items**	**Authors**
Attitude	Using virtual commerce is a good idea.	(Barkhi et al., 2008)
	Using virtual commerce is a wise idea.	
	I like the idea of using virtual commerce.	
	Using virtual commerce is pleasant.	
Perceived Ease of Use	I have the necessary resources to use virtual commerce.	(Davis et al., 1989; Thomas-Francois & Somogyi, 2021; Venkatesh et al., 2003)
	Using virtual commerce does not require much mental effort.	
	I am able to use virtual commerce without the help of a specialist.	
	Learning to operate virtual commerce would be easy for me.	
	I would consider mobile marketing flexible for interaction.	
	It would be easy for me to become proficient in using virtual commerce.	
	Overall, I believe virtual commerce is easy to use.	
Perceived Usefulness	Using virtual commerce in my shopping would allow me to perform tasks more quickly.	(Alkarney & Almakki, 2022)
	Virtual commerce would increase my shopping performance.	
	Using virtual commerce in shopping would improve my productivity.	
	Using virtual commerce would enhance my shopping effectiveness.	
	Using virtual commerce would make my shopping easier.	
	I consider virtual commerce useful for my shopping.	
Purchase Intention	I intend to purchase using virtual commerce.	
	I intend to use virtual commerce to make my purchases.	

EJABM European Journal of Applied Business and Management
ISSN 2183-5594

	I intend to use virtual commerce frequently.	(Alkarney & Almakki, 2022)
Convenience	Using Virtual Commerce would be convenient for me.	(Childers et al., 2001; Thomas-Francois & Somogyi, 2021)
	Virtual Commerce would make my shopping less time-consuming.	
	Using Virtual Commerce would be a convenient way to shop.	
	Virtual Commerce would allow me to shop whenever I want.	
	Virtual Commerce would help me save time.	