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Abstract: This study investigates the factors influencing customer loyalty in online commerce with manufacturing firms in Vietnam, focusing on the mediating role of purchase intention. Grounded in the theory of planned behaviour (TPB) and the technology acceptance model (TAM), the research employs the PLS-SEM method to validate the proposed model. The findings reveal that CSR, attitude, subjective norms, and perceived behavioural control significantly impact purchase intention. In turn, purchase intention emerges as a critical driver of customer loyalty. Particularly, perceived value moderates the relationship between purchase intention and customer loyalty, strengthening this connection and highlighting its pivotal role in fostering long-term customer relationships. These results provide actionable insights for Vietnamese manufacturing firms aiming to enhance customer engagement and loyalty.

Keywords: customer loyalty; corporate social responsibility; CSR; manufacturing firms; purchase intention; perceived value; Vietnam.

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1 Introduction

According to Carroll (1991), corporate social responsibility (CSR) is often conceptualised as a pyramid with four layers: economic, legal, ethical, and philanthropic responsibilities, where economic responsibilities serve as the foundation. Modern definitions expand CSR beyond voluntary actions, emphasising its integration into core business strategies to ensure long-term sustainability (Porter and Kramer, 2006). In practice, CSR is considered a crucial element for improving corporate reputation, consumer trust, and long-term profitability (Dahlsrud, 2008).

CSR has become an integral aspect of business strategies globally, including in Vietnam, particularly in manufacturing firms. CSR initiatives in this sector often focus on sustainable production practices, ethical labour policies, and community development programs. In the context of Vietnam, manufacturing companies have been increasingly incorporating CSR as a response to growing pressure from international markets and consumers demanding more transparent and responsible business operations (Fatima and Elbanna, 2023). CSR in Vietnam's manufacturing sector not only enhances brand reputation but also drives operational efficiencies and contributes to long-term sustainability (Nguyen et al., 2019, 2018).

One of the significant challenges facing manufacturing firms in Vietnam is balancing economic growth with environmental responsibility. Many companies have adopted greener production processes, waste reduction techniques, and energy-efficient technologies to align with global CSR standards. By integrating CSR into their core business strategies, Vietnamese manufacturing firms are positioning themselves as responsible players in the global supply chain, enhancing their competitiveness and fostering a sustainable business model.

Therefore, CSR is recognised as a strategic approach that provides both environmental and social competitive advantages (Zhang and Ahmad, 2021). The term CSR indicates that companies bear responsibility towards the society where they operate, though its interpretation can vary (Okoye, 2009). In some instances, CSR is about legal obligations, while in others, it pertains to ethical or philanthropic duties. Despite the complexity and variety in CSR definitions, many conceptual frameworks in CSR literature emphasise it as a responsibility toward society or stakeholders (Deng et al., 2013; Zhang and Ahmad, 2021).

On the other hand, some studies have focused on customer responses and the influence of CSR practices on consumer behaviour (Chomvilailuk and Butcher, 2013; Li et al., 2019; Marquina Feldman and Vasquez-Parraga, 2013). For example, several studies indicate that CSR initiatives positively affect consumer behaviour outcomes, such as product evaluation, firm perception, word of mouth, purchase intention, and brand equity. Gao and Mattila (2014) also found a positive relationship between a company's CSR performance and consumer satisfaction.

In the manufacturing sector, Hsu and Bui (2022), Öberseder et al. (2014) and Popa et al. (2022) conducted the influence of CSR on consumer behaviour and consumer purchase intention. These studies indicate that CSR efforts, particularly in ethical and environmental areas, can significantly shape consumer behaviour in the manufacturing sector, enhancing both customer engagement and purchase intentions.

While the existing studies have extensively explored the impact of CSR initiatives on consumer behaviour, including aspects like purchase intention, product evaluation, and firm perception, limited attention has been given to how CSR influences long-term consumer loyalty, particularly in the context of online commerce. Furthermore, the moderating role of perceived value – how consumers evaluate the benefits and costs of engaging with a company – remains underexplored in these studies. This gap is particularly significant in the manufacturing sector in Vietnam, where the interplay between CSR practices and online consumer loyalty is shaped by unique market dynamics and cultural factors. Understanding how CSR initiatives, combined with perceived value, influence consumer loyalty in Vietnam's manufacturing firms operating

in online commerce would provide a more nuanced perspective on CSR's effectiveness in retaining customers in a rapidly digitising economy.

The purpose of this study is to investigate the factors influencing customer loyalty through purchase intention in the context of Vietnamese manufacturing firms, with a specific focus on the role of CSR. The research aims to explore how CSR contributes to fostering customer loyalty in the rapidly growing online commerce environment. Additionally, the study examines the moderating effect of perceived value on the relationship between CSR practices and consumer loyalty. By addressing these objectives, the research seeks to provide insights into the effectiveness of CSR strategies in retaining customers and enhancing competitive advantage in Vietnam's manufacturing sector. The key research question guiding this study is: "to what extent do CSR impacts customer loyalty via purchase intention, and how does perceived value moderate this relationship in Vietnamese manufacturing firms?"

2   Literature review and hypothesis development

2.1   Literature review

2.1.1   CSR

CSR emphasises the interconnectedness of business and society, rather than viewing them as separate entities (Wood, 1991). It reflects a business's ongoing dedication to ethical conduct and contributing to economic progress, while enhancing the well-being of employees, their families, and the broader community (Moir, 2001). CSR is also framed as a method to reconcile the interests of businesses and society, minimising the need for increased government intervention in global markets (Makower, 2011). Additionally, it involves achieving business success in ways that uphold ethical principles and show respect for people, communities, and the environment. CSR is deemed essential for long-term business success (Maqbool and Zameer, 2018).

Naderian and Baharun (2015) highlight the pivotal role of CSR in influencing consumer behaviour within the retail sector. CSR initiatives, such as partnerships with non-profit organisations or the adoption of ethical practices like avoiding exploitative labour conditions, have been shown to enhance customer loyalty, strengthen emotional bonds with the store, and increase consumer engagement. These actions, in turn, significantly impact purchasing patterns by driving higher store patronage and increasing the overall volume of purchases (Lichtenstein et al., 2004).

CSR in manufacturing firms plays a critical role during periods of innovation, serving as a bridge between technological advancements and sustainable business practices. As firms adopt innovative technologies, they increasingly integrate CSR into their operational strategies to meet the growing demand for environmentally and socially responsible production. CSR initiatives during innovation periods often focus on reducing environmental impact, such as minimising waste or lowering carbon emissions, which enhances the firm's reputation and aligns with consumer expectations for sustainability (Maqbool and Zameer, 2018; Popa et al., 2022).

2.1.2 *Theory of planned behaviour*

The theory of planned behaviour (TPB), introduced by Ajzen (1991), is a key model for predicting consumer behaviour. It suggests that an individual's intention to act is shaped by attitudes toward the behaviour, perceived social pressures (subjective norms), and perceived behavioural control (PBC) – how easy or difficult they think it will be to perform the action.

TPB helps explain consumer choices, such as purchasing decisions, by highlighting factors like attitudes toward products, social influence from peers, and perceived ease of purchase. This model is particularly useful in areas like sustainable consumption and online shopping, enabling companies to tailor strategies to consumer expectations and motivations (Armitage and Conner, 2001; Naderian and Baharun, 2015).

2.2 *Empirical studies*

The study by Hsu and Bui (2022) explored consumers' perspectives and behaviours regarding CSR across three locations – Vietnam, Indonesia, and Taiwan. It examined different CSR components, including those aimed at the environment, society, employees, customers, suppliers, and shareholders. The findings revealed that consumers in all three regions prioritised CSR efforts focused on themselves, with Vietnamese respondents emphasising employee welfare, while Indonesian and Taiwanese consumers valued CSR efforts related to the environment and society. Indonesian consumers also showed interest in supplier-related CSR. Although CSR positively influenced brand reputation in all regions, its effect on purchase intention was significant only in Indonesia and Taiwan, not in Vietnam.

Popa et al. (2022) investigates the impact of CSR initiatives on consumer behaviour in the cosmetics industry, specifically in the context of online commerce. It examines both short-term (buying intention) and long-term (customer loyalty) effects of CSR activities. The study identifies various CSR dimensions – legal, ethical, philanthropic, environmental, and consumer respect – as key factors influencing customer behaviour. The findings reveal that CSR activities positively affect both purchase intention and customer loyalty, with brand trust serving as a strong mediator in these relationships. This suggests that companies engaged in CSR can enhance consumer trust and loyalty, which translates into higher purchase intentions. The research also provides theoretical and practical insights, showing how CSR can serve as a competitive advantage for businesses in the cosmetics sector.

Moreover, Dai and Guo (2024) explores how CSR influences consumers' purchase intentions through a moderated mediation model grounded in attribution theory. The research demonstrates that consumers' perceptions of CSR directly and positively impact their purchase intentions. Additionally, perceived CSR indirectly affects purchase behaviour by fostering altruistic attributions, where consumers view the company's CSR efforts as genuine and selfless. The study also finds that perceived consumer effectiveness strengthens the link between perceived CSR and altruistic attribution. Furthermore, the relationship between altruistic attributions and purchase intentions is moderated by different beliefs about CSR and corporate ability (CSR-CA), indicating that consumers' views on a company's capability can influence how CSR efforts translate into purchasing decisions. The findings provide actionable insights for both academia and industry on how CSR can enhance consumer trust and engagement.

2.3   Hypothesis development

2.3.1   CSR affects purchase intention

CSR has a significant impact on consumer purchasing intentions, particularly in the cosmetics industry. In manufacturing firms, consumers are increasingly influenced by a company's ethical practices, environmental sustainability efforts, and contributions to the community. When consumers perceive a company as being socially responsible, they are more likely to view its products favourably, which enhances their intention to purchase (Maignan and Ferrell, 2004). CSR activities, such as reducing harmful environmental practices or supporting fair labour standards, can build trust with consumers, leading to stronger brand loyalty and higher purchase intentions, especially in industries like cosmetics where ethical sourcing and environmental impact are key concerns (Popa et al., 2022).

Additionally, studies have shown that CSR efforts in cosmetics manufacturing contribute to both short-term and long-term consumer behaviour. In the short-term, CSR initiatives positively influence consumers' attitudes toward the brand, encouraging immediate purchase decisions. In the long-term, CSR helps foster customer loyalty by creating emotional connections with the brand through values alignment (Lichtenstein et al., 2004). Consumers are particularly drawn to brands that integrate CSR into their business models, viewing such companies as more trustworthy and aligned with their personal values. This effect is even stronger when CSR efforts are transparently communicated, highlighting the importance of CSR in shaping consumer behaviour in the cosmetics sector (Naderian and Baharun, 2015).

Based on the above arguments, the authors proposed the hypothesis is:

Hypothesis 1 (H1)   CSR positively affects purchase intention in Vietnamese
                     manufacturing firms.

2.3.2   Attitude affects purchase intention

Attitude is a key factor influencing consumer intentions to purchase cosmetics from manufacturing firms. Positive attitudes, especially related to ethics, sustainability, and product effectiveness, drive stronger purchase intentions (Anchliya et al., 2023; Li et al., 2023). When consumers perceive a brand as trustworthy and aligned with their values, such as using natural ingredients or being cruelty-free, they are more likely to buy (Ajzen, 1991; Maignan and Ferrell, 2004).

Additionally, factors like marketing, product quality, and customer experience shape these attitudes. In the cosmetics industry, sensory appeal and product efficacy influence positive perceptions, directly impacting purchase decisions (Fishbein and Ajzen, 1975; Naderian and Baharun, 2015). This highlights the role of both emotional and rational factors in driving consumer behaviour.

Hypothesis 2 (H2)   Attitude positively affects purchase intention in Vietnamese
                     manufacturing firms.

2.3.3   Subjective norms affect purchase intention

Subjective norms, which refer to the perceived social pressure to perform or not perform a particular behaviour, play a significant role in shaping consumers' intentions to

purchase online. According to Schepers and Wetzels (2007), subjective norms strongly influence consumers' behavioural intentions, particularly in environments where peer or societal expectations are highly visible. In online commerce, this influence becomes more pronounced during the early stages of decision-making, especially for inexperienced users who rely on the opinions and recommendations of others to guide their purchasing decisions (Pudaruth and Busviah, 2018).

For new users engaging in online shopping, subjective norms are often shaped by reviews, recommendations, and social endorsements from trusted sources, including friends, family, and social media influencers. The importance of these social cues is evident across various sectors, where studies have shown that subjective norms significantly impact the adoption and use of services (Prayoga et al., 2018; Rawashdeh, 2015; Zolait, 2010). In online commerce, social validation acts as a critical factor in reducing perceived risk and enhancing trust, ultimately driving higher purchase intentions. Therefore, businesses should prioritise fostering positive social proof and customer endorsements to leverage the impact of subjective norms on consumer behaviour.

Hypothesis 3 (H3)   Subjective norms positively affects purchase intention in Vietnamese manufacturing firms.

2.3.4 *PBC affects purchase intention*

PBC, which refers to a consumer's belief in their ability to execute a purchase, significantly affects purchase intentions in online commerce, especially for manufacturing firms. When consumers perceive online shopping platforms as easy to navigate, secure, and informative, their sense of control increases, leading to a higher likelihood of making a purchase (Fishbein and Ajzen, 1975; Pavlou and Fygenson, 2006). Manufacturing firms that optimise their websites for user experience by offering clear product details and secure transactions can enhance PBC and boost consumer confidence in purchasing.

Moreover, PBC also extends to logistical considerations, such as delivery options and payment methods, which significantly impact purchase decisions in online commerce. If customers feel that they have control over delivery timing, payment flexibility, or return policies, they are more likely to feel confident in completing a purchase. Studies in online retail settings demonstrate that when consumers perceive fewer barriers or obstacles in the buying process, their purchase intentions increase (Pavlou and Fygenson, 2006). In manufacturing firms, where product specifications or complex features may create perceived difficulties, simplifying the online shopping process and offering customer support can enhance PBC. This makes PBC an essential factor for firms aiming to improve the customer experience and encourage online purchasing behaviour (George, 2004; Hsin Chang and Wang, 2011; Kumar, 2000).

Hypothesis 4 (H4)   Trust positively affects purchase intention in Vietnamese manufacturing firms.

2.3.5 *Purchase intention affects customer loyalty*

Purchase intention serves as a key determinant of customer loyalty, especially within the manufacturing industry. A strong purchase intention often leads to consistent purchasing

behaviour, which in turn reinforces brand loyalty. According to studies by Curtis et al. (2011) and Imran et al. (2020), a direct relationship exists between purchase intention and loyalty, though this connection may also be mediated by other factors. For example, Imran et al. (2020) explored this relationship by examining the moderating effect of customer trust on the link between purchase intention and loyalty.

Besides, in the study conducted by Curtis et al. (2011), they identified a positive correlation between purchase intention and customer loyalty, demonstrating that as customers' intent to repurchase increases, their brand loyalty also strengthens. This finding highlights the pivotal role of purchase intention in driving long-term loyalty. The study further notes that while satisfaction is closely linked to repurchase intention, it does not fully account for repurchase behaviour, emphasising the need to explore other influencing factors. These insights provide valuable guidance for managers aiming to improve both customer satisfaction and loyalty.

Based on the above arguments, the authors propose the following hypothesis:

Hypothesis 5 (H5)   Purchase intention positively affects customer loyalty in Vietnamese manufacturing firms.

2.3.6 Perceived value moderates the relationship between purchase intention and customer loyalty

Purchase intention is a critical concept in consumer decision-making, reflecting the reasons why individuals choose to purchase from specific brands. Schütte and Ciarlante (2016) define it as a consumer's inclination to buy a particular product under certain conditions. This decision-making process is inherently complex, intertwining with consumer behaviour, perceptions, and attitudes. Moreover, purchase intention serves as a valuable predictor of purchasing behaviour, shaped by factors such as price, perceived quality, and value. Goyette et al. (2010) further highlights that both internal motivations, such as personal preferences, and external influences, like social or environmental factors, play significant roles in shaping consumer purchase decisions.

It is essential to note that customers base their actions on their perceived value, which significantly influences customer loyalty across various contexts, such as retail stores or airlines (Sirdeshmukh et al., 2002). The interplay between purchase intention, perceived value, and customer loyalty is central to understanding consumer behaviour. Perceived value, defined as the net assessment of benefits versus sacrifices (Hsin Chang and Wang, 2011; Woodruff, 1997), acts as a critical driver of purchase intention by shaping positive evaluations of products or services. High perceived value not only enhances customers' intentions to purchase but also fosters loyalty, as consumers are more likely to remain committed to businesses that deliver superior value (Hsin Chang and Wang, 2011). Drawing from the means-end chain theory (Koo, 2006), customers' value-driven evaluations initiate goal-oriented purchase behaviour, leading to repeated interactions and loyalty when expectations are met or exceeded. Furthermore, the economic theory of utility (Henderson and Quandt, 1985) suggests that perceived value reflects the net utility gained by consumers, making it a reliable predictor of purchase decisions (Chen and Dubinsky, 2003) and, consequently, customer loyalty. This highlights the vital role of perceived value as a bridge linking purchase intention and loyalty, emphasising its significance in fostering lasting customer relationships (Hsin Chang and Wang, 2011).
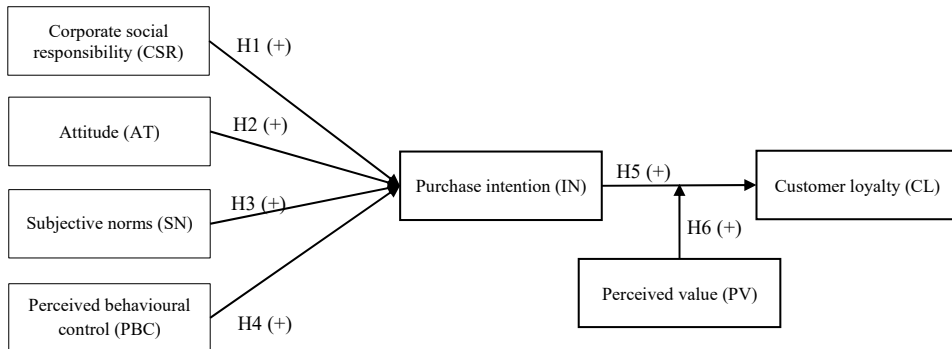
Based on the above discussions, we propose the hypothesis as follows:

Hypothesis 6 (H6)   Perceived value moderates the relationship between purchase
intention and customer loyalty n Vietnamese manufacturing firms.

3   Research model and methodology

3.1   Research model

Figure 1   Research model

3.2   Research methods

This study employed a combination of qualitative and quantitative research methods to ensure comprehensive data collection and analysis. In the first phase, qualitative methods were utilised, including expert interviews and customer surveys, to refine and validate the observation variables within the draft scales. Through in-depth group discussions, the main scales were developed, providing the foundation for formal survey design. These discussions, involving 30 consumers using online commerce from manufacturing firms, helped ensure that the factor scales were appropriate and reliable. The feedback from these discussions allowed for adjustments to the survey questions, improving the overall reliability and relevance of the questionnaire.

In the quantitative phase, the partial least squares structural equation modelling (PLS-SEM) technique was used to test and validate the research model. The process began by evaluating the measurement model for construct validity, reliability, and discriminant validity to ensure the robustness of the constructs. The results of the PLS-SEM analysis were reported, providing insights into the research findings and supporting the study's conclusions. This methodical approach ensured that both the qualitative and quantitative data contributed to the development of a highly reliable and valid research model.

3.3   Data collection and sample

To meet the sample size requirements based on Bollen's (1989) legal basis for determining sample sizes, the minimum sample size should be five times the number of observed variables. Accordingly, a questionnaire was distributed to 300 consumers via

email and directly at the core stores, resulting in a collection of 281 valid responses. This accounted for 93.7% of the total questionnaires distributed, indicating a high response rate that ensures the sample size is sufficient for reliable analysis.

4   Research results and discussion

Following the steps listed above, the measurement model underwent assessment with a focus on the reliability of the indicators, construct, convergent validity, and discriminant validity. The results are found in Table 1.

Table 1   Composite reliability

	Cronbach's alpha	Composite reliability	Average variance extracted (AVE)
AT	0.949	0.955	0.867
CL	0.987	0.989	0.963
CSR	0.993	0.993	0.979
IN	0.988	0.988	0.964
PBC	0.990	0.990	0.981
PV	0.990	0.990	0.979
SN	0.999	0.999	0.996

The reliability and validity metrics presented in Table 1 demonstrate the robustness of the constructs being measured. All constructs, including attitude (AT), customer loyalty (CL), CSR, intention (IN), PBC, perceived value (PV), and subjective norms (SN), exhibit exceptional reliability, as evidenced by their Cronbach's alpha and composite reliability (CR) values exceeding 0.9. These high values confirm excellent internal consistency, indicating that the items used to measure each construct are highly correlated and reliable.

The AVE values for all constructs are also above the recommended threshold of 0.5, with most values exceeding 0.96. This indicates strong convergent validity, where each construct explains a substantial portion of the variance in its respective indicators. Notably, constructs like SN and PBC achieve AVE values close to 1, reflecting nearly perfect variance explanation. While these highlights strong construct validity, it may also warrant further review to ensure there is no redundancy or overlap among the measured items.

In terms of individual construct performance, SN stands out with the highest values across all metrics (Cronbach's alpha = 0.999, CR = 0.999, AVE = 0.996), indicating that this construct is particularly well-defined and reliable. Similarly, PBC and CSR also show exceptionally high metrics, reinforcing their robustness. On the other hand, attitude (AT) displays slightly lower values compared to other constructs (Cronbach's alpha = 0.949, CR = 0.955, AVE = 0.867), but these are still well above the acceptable thresholds, confirming its strong reliability and validity.

Overall, the metrics provided in Table 1 confirm that the measurement model is highly reliable and valid. The Cronbach's alpha and CR values far exceed the commonly accepted threshold of 0.7, and the AVE values indicate sufficient convergent validity. However, the exceptionally high metrics, particularly for SN and other constructs with

AVE close to 1, may necessitate further investigation to rule out potential collinearity or item redundancy.

Table 2 Discriminant validity assessment using HTMT ratio

	AT	*CL*	*CSR*	*IN*	*PBC*	*PV*	*SN*	*PV × IN*
AT								
CL	0.31							
CSR	0.492	0.325						
IN	0.462	0.405	0.597					
PBC	0.346	0.323	0.413	0.388				
PV	0.279	0.498	0.252	0.503	0.127			
SN	0.354	0.259	0.542	0.455	0.216	0.201		
PV × IN	0.317	0.039	0.198	0.592	0.169	0.184	0.168	

Table 2 assesses discriminant validity using the heterotrait-monotrait (HTMT) ratio, ensuring that constructs measure distinct concepts. Discriminant validity is confirmed when HTMT values are below the threshold of 0.85. In this table, all HTMT values fall below this limit, indicating satisfactory discriminant validity across all constructs.

Figure 2 Structural equation modelling (PLS-SEM) (see online version for colours)
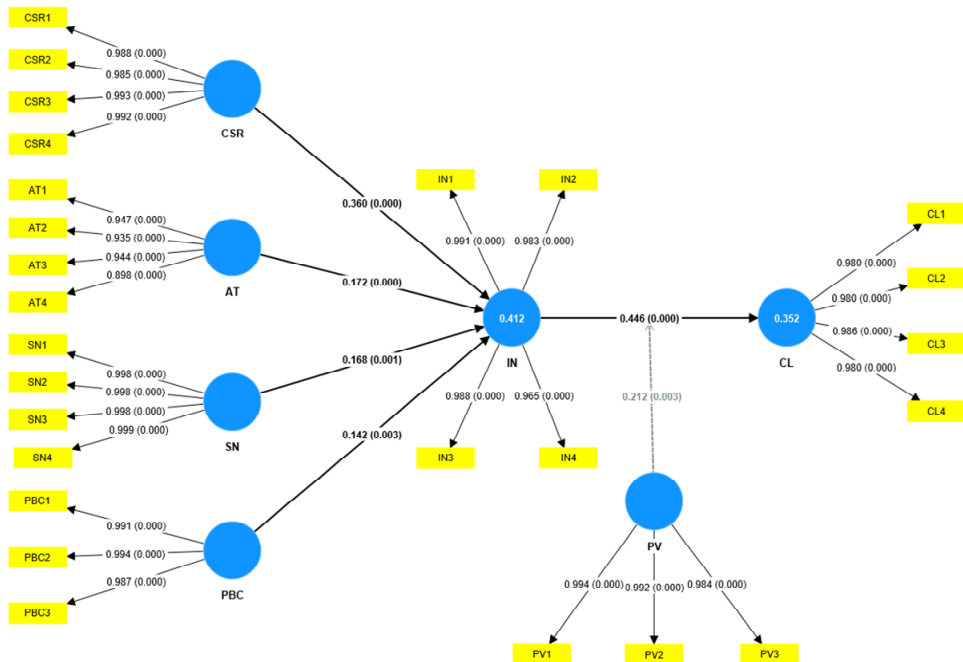
The HTMT values for attitude (AT) range between 0.279 and 0.492 when compared with other constructs, confirming AT's distinctiveness. Similarly, customer loyalty (CL) exhibits low HTMT values with other constructs, such as 0.498 with perceived value (PV), demonstrating sufficient differentiation. Then, the interaction term perceived value

and intention (PV × IN) consistently shows low HTMT ratios with other constructs, ranging from 0.039 to 0.592. For example, its HTMT values with CSR and subjective norms (SN) are 0.198 and 0.168, respectively, underscoring its uniqueness within the model. Other constructs, like PBC, also maintain clear distinctions, with low HTMT values such as 0.216 with SN and 0.127 with PV. Similarly, CSR demonstrates discriminant validity, with its highest HTMT value being 0.597 with intention (IN), which is still well within the acceptable range. The results in Table 2 confirm robust discriminant validity for all constructs. The low HTMT values indicate minimal overlap, ensuring the constructs are conceptually distinct and support the validity of the measurement model.

The figure illustrates a structural equation model (SEM) with latent variables and their observed indicators. Each latent variable demonstrates strong relationships with its indicators, as shown by high factor loadings and statistical significance ($p < 0.05$). For example, CSR has loadings between 0.985 and 0.993, while SN shows near-perfect loadings of 0.998–0.999.

Structural relationships reveal significant effects between latent variables. CSR has the strongest influence on intention (path coefficient = 0.360, $p = 0.000$), followed by attitude (0.172, $p = 0.000$), subjective norms (0.168, $p = 0.001$), and PBC (0.142, $p = 0.003$). Intention strongly impacts customer loyalty (0.446, $p = 0.000$), while Perceived Value has a moderate effect on customer loyalty (0.212, $p = 0.003$). All constructs meet reliability and validity requirements, with high loadings and statistically significant relationships confirming their robustness. The model emphasises CSR's key role in shaping intention, which ultimately drives customer loyalty. Additionally, factors like attitude, subjective norms, and perceived value play supporting roles in influencing customer behaviour. In conclusion, the SEM validates the theoretical framework, showing how CSR, Intention, and other constructs collectively impact customer loyalty. The statistically significant results ensure the model's reliability and practical implications for understanding customer decision-making.

Table 3   Inner VIF values

	AT	CL	CSR	IN	PBC	PV	SN	PV × IN
AT				1.359				
CL								
CSR				1.779				
IN		2.013						
PBC				1.240				
PV		1.362						
SN				1.430				
PV × IN		1.568						

Table 3 provides the VIF values utilised to assess multi-collinearity. According to Hair et al. (2013), multi-collinearity becomes a concern when VIF values surpass 4.0. Since all VIF values in Table 3 fall below this limit, it indicates that multi-collinearity is not an issue, ensuring reliable and unbiased estimates for the model.

Table 4   F-square

	AT	CL	CSR	IN	PBC	PV	SN	PV × IN
AT				0.037				
CL								
CSR				0.126				
IN		0.154						
PBC				0.028				
PV		0.130						
SN				0.034				
PV × IN		0.131						

According to Cohen's (2013) guidelines, $f^2 \geq 0.02$, $f^2 \geq 0.15$, and $f^2 \geq 0.35$ represent small, medium, and large effect sizes, respectively. From Table 4, we can conclude that:

The F-square values in Table 4 provide insights into the effect sizes of the independent variables on the dependent variables within the model. According to Cohen's (2013) guidelines, effect sizes are categorised as small ($f^2 \geq 0.02$), medium ($f^2 \geq 0.15$), and large ($f^2 \geq 0.35$). The analysis reveals varying levels of impact for the constructs. Several constructs demonstrate small effect sizes. Attitude (AT) has a small effect on intention (IN), with an f^2 value of 0.037, indicating a limited contribution to explaining intention. Similarly, PBC and subjective norms (SN) show small effects on Intention, with f^2 values of 0.028 and 0.034, respectively. These findings suggest that while these constructs are significant, their individual influence on Intention is relatively minor. Medium effect sizes are observed for some key constructs. CSR has a medium effect on intention, with an f^2 value of 0.126, indicating a stronger contribution compared to constructs with small effect sizes. Additionally, perceived value (PV) exhibits a medium effect on customer loyalty (CL), with an f^2 value of 0.130, emphasising its importance in shaping customer loyalty. The interaction term PV × IN also demonstrates a medium effect on customer loyalty, with an f^2 value of 0.131, highlighting the significance of the combined influence of perceived value and Intention. In particular, none of the constructs in the model exhibit a large effect size ($f^2 \geq 0.35$). While some constructs, such as CSR, PV, and PV × IN, have medium impacts, none dominate the variance explanation in the dependent variables.

Table 5   R-square and R-square adjusted

	R-square	R-square adjusted
CL	0.359	0.352
IN	0.420	0.412

Table 5 shows the R-square and adjusted R-square values for customer loyalty (CL) and purchase intention (IN), providing insights into the model's explanatory power. For CL, the R-square value of 0.359 indicates that 35.9% of the variance in customer loyalty is explained by the independent variables. The adjusted R-square value of 0.352 accounts for model complexity, showing a comparable proportion of variance explained. This suggests a moderate level of explanatory power, though other factors may also influence customer loyalty. Furthermore, for purchase intention (IN), the R-square value is 0.420, meaning 42.0% of the variance in Intention is explained by the model. The adjusted

R-square value of 0.412 indicates a slight reduction, confirming a strong and reliable model fit for this dependent variable. The model effectively explains a significant portion of the factors driving Intention.

Table 6   Hypothesis testing

Hypothesis	Path	Original sample (O)	P values	Accept/reject hypothesis
H1	CSR → IN	0.360	0.000	Accept
H2	AT → IN	0.172	0.000	Accept
H3	SN → IN	0.168	0.001	Accept
H4	PBC → IN	0.142	0.003	Accept
H5	IN → CL	0.446	0.000	Accept
H6	PV × IN → CL	0.212	0.003	Accept

The findings in Table 6 reveal that CSR, attitude, subjective norms, and PBC have a significant and positive impact on purchase intention in Vietnamese manufacturing firms, with p-values below 5%. Notably, the study highlights the critical moderating role of perceived value in strengthening the relationship between purchase intention and customer loyalty. In addition, the results of hypothesis testing, as presented in Table 6, confirm that all proposed hypotheses are supported, with p-values below the 0.05 significance threshold. This demonstrates the robustness of the relationships hypothesised in the model.

First, CSR: the path coefficient of 0.360 with a p-value of 0.000 indicates that CSR has a very strong and highly significant effect on purchase intention. Consumers are more likely to be influenced by a firm's CSR activities, such as ethical practices or sustainability efforts, when deciding whether to purchase from them. The results are consistent (Lichtenstein et al., 2004; Naderian and Baharun, 2015; Popa et al., 2022).

Second, attitude: the path coefficient of 0.172 and a p-value of 0.000 suggest that attitude has a statistically significant but relatively moderate effect on purchase intention in online commerce. This indicates that a consumer's positive attitude toward a brand or product moderately influences their intention to make a purchase. The results are consistent (Anchliya et al., 2023; Li et al., 2023; Naderian and Baharun, 2015).

Third, subjective norms: the path coefficient of 0.168 and a p-value of 0.001 suggest that subjective norms (the influence of social pressure or expectations) also have a significant and moderate impact on purchase intention. This implies that the opinions of others (e.g., family, friends) can shape a consumer's likelihood of buying products online. The findings are demonstrated in the studies by Prayoga et al. (2018), Rawashdeh (2015) and Zolait (2010).

Fourth, PBC: the path coefficient of 0.142 and a p-value of 0.003 show that PBC has a significant and moderate effect on purchase intention. This suggests that when consumers feel more in control of the purchasing process (due to ease of use, accessibility, or support), they are more likely to engage in online purchases. The findings are demonstrated in the studies by Pavlou and Fygenson (2006), George (2004), Hsin Chang and Wang (2011) and Kumar (2000).

Regarding Hypothesis 5 (H5), it asserts that Intention positively affects customer loyalty (CL). With a path coefficient of 0.446 and a p-value of 0.000, this hypothesis is strongly supported. This result underscores the critical role of purchase intention in fostering customer loyalty in the manufacturing sector. In particular, Hypothesis 6

evaluates the moderating role of perceived value (PV) on the relationship between purchase intention and customer loyalty. The path coefficient of 0.212, with a p-value of 0.003, supports this hypothesis, confirming that perceived value strengthens the link between intention and loyalty. This emphasises the importance of delivering perceived value to sustain customer relationships. The findings are consistent with the studies Hsin Chang and Wang (2011), Woodruff (1997) and Chen and Dubinsky (2003).

In summary, the hypothesis testing results validate the proposed model, confirming the significant and positive roles of CSR, attitude, subjective norms, and PBC in influencing purchase intention. Furthermore, the findings highlight the strong impact of purchase intention on customer loyalty and the moderating effect of perceived value, providing practical insights for enhancing customer behaviour in the manufacturing sector.

5 Conclusions and limitations

By using PLS-SEM method, the results validate the proposed model, demonstrating that CSR, attitude, subjective norms, and PBC significantly influence purchase intention. Moreover, purchase intention strongly drives customer loyalty, and perceived value enhances this relationship. These findings provide valuable insights for Vietnamese manufacturing firms to improve customer engagement and loyalty by focusing on CSR, fostering positive attitudes, leveraging social influence, and enhancing consumer control and perceived value. Overall, the results suggest that while CSR is the strongest predictor of purchase intention, attitudes, social influences, and consumer control are also important factors that firms should consider in their marketing strategies.

This study has a few limitations. First, the model lacks a moderator variable, which could have helped explore more complex relationships between CSR, attitudes, and purchase intentions. Including a moderator might reveal deeper insights into these dynamics. Second, the research sample was limited to Ho Chi Minh City, reducing the generalisability of the findings to other regions in Vietnam. Expanding the sample to different areas would provide a more comprehensive understanding of how CSR and other factors influence consumer behaviour across the developing countries.

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