

# The Determinant Factors of Shopping Cart Abandonment Among E-commerce Customers in Indonesia

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**Abstract**—Predicting the non-purchase behavior of potential customers, such as the abandonment of online shopping carts, is a pivotal factor in determining the success of companies. Despite several conducted studies, further investigation is still required to gain a profound understanding of the underlying causes of these phenomena. The research aims to analyze the motivating factors behind shopping cart abandonment among e-commerce customers in Indonesia using a quantitative method. Furthermore, the population size is undefined, and the sample consists of 200 respondents selected through purposive sampling. The sample size is determined by five times the indicator number. The data analysis is conducted using Structural Equation Modeling (SEM) through SmartPLS 4.0.8.5, and the Coefficient of determination (R<sup>2</sup>) value for shopping cart abandonment is found to be 37.5%. The results show that complicated checkout, information overload, complicated policies, and limited shipping options positively impact shopping cart abandonment. Complicated checkout emerges as the most significant variable. Meanwhile, perceived cost and emotional ambivalence have no impact. The research also provides theoretical contributions and suggests future research for e-commerce companies and merchants. The theoretical contribution is how user emotions, user experience, merchant policies, and e-commerce regulation affect shopping cart abandonment. From the practical implications, e-commerce companies should focus on the user experience during checkout to reduce shopping cart abandonment.

**Index Terms**—Shopping Cart Abandonment, E-commerce Customers, Indonesia

## I. INTRODUCTION

**I**N 2021, a significant portion of the global population, approximately 2.14 billion people, accounting for 27.6% of the total 7.74 billion people worldwide, engaged in online shopping. Approximately two billion people opted to purchase goods or services through

digital platforms, and by 2020, the e-commerce companies achieved remarkable success, surpassing US\$ 4.2 trillion in global retail sales [1]. According to Statista, in 2022, the Gross Merchandise Value (GMV) of the e-commerce market in Indonesia was approximately US\$ 59 billion [2]. Then, in the first quarter of 2022, Tokopedia ranked first among the most clicked e-commerce sites, with more than 158 million clicks, followed by Shopee and Lazada [3].

Companies' potential in business can be maintained and increased by predicting the potential customers' non-purchase behavior, such as online shopping cart abandonment, closely related to e-commerce. Online shopping cart abandonment can be defined as consumers' placement of item(s) in their online shopping cart without purchasing any item(s) during the shopping session [4].

Paying attention to the phenomenal shopping cart abandonment is necessary [5]. The average shopping cart abandonment rate from 18 companies is 78.16%. The number is very high [6]. It is imperative to thoroughly examine consumers' perceptions and intentions regarding online purchase completion to gain a comprehensive understanding of the recurring nature of this phenomenon. Despite the numerous strategies employed to entice consumers to visit websites, a significant number of people still opt to make purchases or abandon their online shopping carts [4], resulting in revenue losses [7].

Most of the time, the customer leaves the cart because the delivery cost is more than expected [8]. The optimization of the desired delivery method represents another aspect where cart abandonment can be enhanced. A noteworthy statistic from a survey of 3,000 people indicates that 77% of respondents opt to abandon their purchase [9]. An intriguing discovery is that 84% favor making a purchase when free shipping is offered, while 30% express their willingness to

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increase purchase size to meet the conditions for free shipping [9].

The research defines cart abandonment as the act of not completing a purchase in online transactions after adding an item to the virtual shopping cart [5, 10]. The process of cart abandonment occurs when consumers visit a website, browse through the web page, select an item of interest, and subsequently add it to their online shopping cart. At this point, consumers have the choice to either proceed with the payment or leave the item in their online shopping cart [11]. Previous studies indicate that current and past e-shopping attitudes have a significant influence on the transaction [12]. The previous study on cart abandonment focuses on perceived cost [10, 13, 14], complicated checkout [13, 15], emotional ambivalence [16, 17], information overload [13], return policy [18], and limited shipping option [19].

The research extends the understanding of e-commerce shopping cart abandonment in two ways. First, the finding is unique because it analyzes e-commerce in developing countries from the point of view of user's feel (perceived cost and emotional ambivalence), e-commerce rules (return policy and complicated checkout), and merchant practices (information overload and limited shipping option). Second, return policies, information overload, and delivery options are investigated to understand why consumers abandon online shopping carts. The application of cart abandonment has been limited to online shopping activities and not extended to other non-online shopping contexts despite its utilization in previous studies concerning online shopping behavior.

Additionally, the risks associated with product and provider performance are also influenced when prices decline to levels deemed unacceptable [7]. It shows that price is a powerful keyword in assessing performance risk when measured separately from others. The previous study finds that perceived cost positively affects shopping cart abandonment [13]. The increase in the variable is due to factors such as product discounts and shipping expenses, affecting overall spending and customer interest in purchasing an item [14]. Previous study indicates that consumers engage in cart abandonment due to the perception of achieving greater cost savings by making purchases from alternative online platforms. Additionally, they often hold the assumption that other online sites offer superior discounts [14]. Abandoning a shopping cart occurs when the total value surpasses a consumer's predetermined reference price for a specific product or category. The behavior can be regarded as an effective strategy for managing cognitive dissonance and alleviating stress [20]. Hence, the first hypothesis is as follows.

H1: Perceived cost positively related to shopping cart abandonment.

The preceding research shows that inconvenience in transactions in e-commerce leads to customer attrition during the final stages of online transactions [15]. The findings suggest that marketers should make concerted efforts to optimize the checkout process, aiming for maximum seamlessness. It entails enabling consumers to input information in a familiar format, thereby reducing instances of cart abandonment and enhancing the overall user experience. The assertion is corroborated by a study showing that a complicated checkout process adversely affects consumers' completion of transactions. As the complexity of the checkout steps increases, consumers become more hesitant to finalize their transactions, resulting in higher levels of cart abandonment [13].

One prominent factor contributing to this phenomenon is the intricacy of the data security measures during checkout, such as the requirement to provide a phone number and personal identification. Concerns regarding data breaches instill fear in consumers, diminishing their willingness to complete transactions and contributing to elevated cart abandonment rates. Moreover, even minor discrepancies can disappoint consumers when the checkout process fails to meet expectations. For instance, when consumers experience prolonged waiting times during checkout or perceive the transaction as risky, it can prove troublesome and result in abandoning the online shopping cart, even though the overall shopping experience on the e-commerce platform is satisfactory [15]. Hence, the following hypothesis is proposed.

H2: Complicated checkout is positively related to shopping cart abandonment.

Consumers may be skeptical about selecting items previously added to their shopping cart. Previous research finds that the serendipity and surprise of a contextual offer may make people feel better and want to spend more [21]. Mobile coupons can boost order size or stimulate immediate purchases at a nearby retailer [22]. Similarly, limited special offers have the potential to pique customers' interest and stimulate their purchase behavior [16]. The presence of mixed emotions and the resulting indecisiveness among consumers during the online shopping process can lead to hesitations when finalizing their purchases. Consequently, this hesitation often leads to increased instances of cart abandonment [11]. To determine

the quality of the shopping experience, consumers frequently rely on the ratings and reviews provided by other people. While these evaluations may not directly impact the level of trust, trust remains a significant factor in influencing consumers' inclination to purchase. Therefore, establishing trust between sellers and potential buyers is essential [16]. The simultaneous experience of positive and negative emotions plays a crucial role in the ultimate decision of whether to proceed with the purchase or abandon the shopping cart [16]. The research shows that the five main reasons online shoppers abandon their carts are research, entertainment, perceived cost, perceived risk, and transaction inconvenience [14]. Thus, the next hypothesis is as follows.

H3: Emotional ambivalence is positively related to shopping cart abandonment.

Information overload refers to the condition where people are confronted with an extensive volume of information through various media channels, surpassing their processing capacity [17]. Before making a purchasing decision, online shoppers carefully evaluate their needs and desires concerning the items in the shopping cart [4]. Subsequently, consumers employ web searches and reviews to enhance their understanding and arrive at a final decision regarding their needs and preferences [13]. Online customers utilize the shopping cart during this study and evaluation stages, although they may not necessarily complete the transaction online [4].

The need for information indirectly contributes to the abandonment of shopping carts, particularly in cases where the residual risk after conducting an information search necessitates thoughtful consideration for amusement purposes with the minimal intention to make a purchase. It is worth noting that online searches and advice from acquaintances also influence the abandonment of shopping carts [5]. Therefore, the informational need indirectly affects cart abandonment. It happens when the remaining risk following a search involves deliberation or is performed for leisure with little intention to make a purchase, considering the influence of online searches and advice from acquaintances [4]. The next hypothesis is as follows.

H4: There is a positive relationship between information overload and shopping cart abandonment.

In e-commerce, a return policy is a term and condition that allows customers to return items within a certain time frame and under certain conditions from

the purchase date [23]. There are various reasons for product returns, including product faults, improper fit, and failure to meet consumer expectations [24]. E-commerce's flexible return policy includes lower prices, longer return periods, ease of use, a wider range of items, and full refunds [25]. The findings indicate that customers tend to assign higher ratings to a product when the associated return policy is user-friendly and less stringent [26]. Hence, the hypothesis is formulated as follows.

H5: Complicated return policy is positively related to shopping cart abandonment.

Product delivery is one of the most important factors influencing consumer purchasing intention [27]. It is also an antecedent of trust that generates a retailer's desire to purchase in B2B e-commerce [28]. Timely delivery of goods not only enhances satisfaction but also increases the likelihood of their continued online purchasing and fosters customer retention [29]. Consequently, selecting a suitable product delivery service provider is a considerable task for e-commerce companies [30]. There are several parts to product delivery, such as the time of delivery [29], the quality of the product [30], and the reputation of the carrier [31].

Delivering the goods on schedule enhances customer satisfaction, improves the frequency of online orders, and aids in customer retention [29]. Online stores should collaborate with reputable product delivery services to ensure the utmost customer satisfaction. Additionally, the presence of damaged products further exacerbates dissatisfaction with retailers' logistical operations [30]. E-retailers can increase the likelihood that consumers will finish online purchases by providing information regarding logistical services and capabilities throughout the e-commerce transaction [31]. Therefore, the next hypothesis states:

H6: Limited shopping options positively related to shopping cart abandonment.

Figure 1 is the proposed conceptual model to address the issue of cart abandonment in Indonesian e-commerce. Customer behavior that causes online shopping cart abandonment is necessary for Indonesian e-commerce to be investigated. Indonesia represents a significant market within Southeast Asia. The research's endeavor holds the potential to assist Indonesian e-commerce in mitigating undesirable occurrences, such as system disruptions and fraudulent transactions. Therefore, the primary objective is to investigate the factors contributing to shopping cart

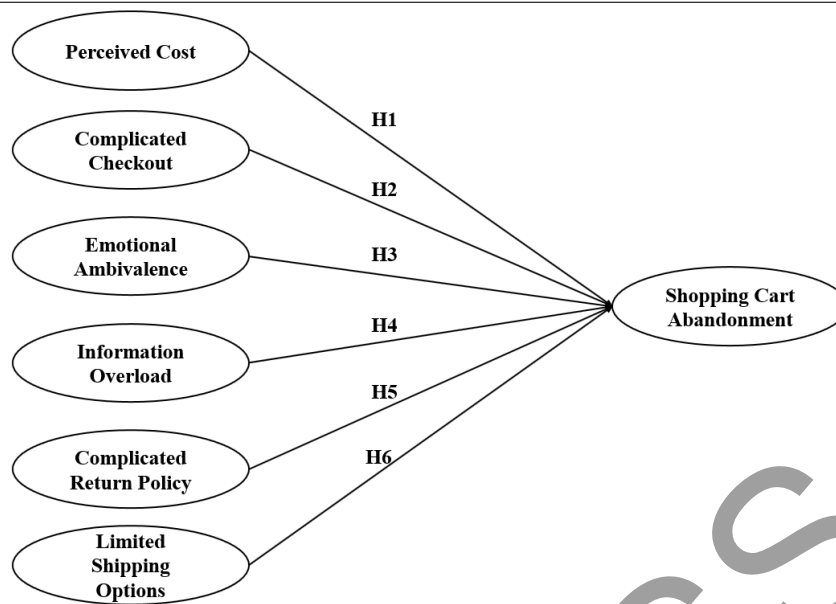


Fig. 1. Research model.

abandonment among e-commerce customers.

## II. RESEARCH METHOD

In behavioral science, Structural Equation Modeling (SEM), specifically SmartPLS 4.0.8.5, is a well-known and often-used method for analyzing data [29]. PLS-SEM and SmartPLS are required to analyze user behavior and psychological state data [25]. PLS-SEM shows greater resilience than traditional multiple regression techniques in handling challenges related to multicollinearity and distributional variations. As a nonparametric approach, it effectively addresses these constraints by providing reliable results despite such issues in the indicators.

However, the research encounters limitations in estimating the population size due to the requirement of accessing the e-commerce provider database containing cart abandonment users. Consequently, the sample size is determined using a criterion of five times the number of indicators, resulting in a minimum requirement of 165 participants. Then, purposive sampling is employed as the sampling technique, specifically targeting e-commerce users who have previously abandoned a cart with a minimum of ten items. Data collection involves the utilization of an online questionnaire distributed through WhatsApp groups and social media platforms.

The questionnaire used in the research consists of two parts. The first part is related to the socio-demographic information of the respondents, including variables such as gender, age group, residential area,

and monthly income. The purpose of the first section is to understand the background of the respondents. Meanwhile, the second part of the questionnaire focuses on measuring the variables discussed in the research. This section includes questions that measure and quantify the relevant variables under investigation. It collects data needed to facilitate the analysis and examination of the hypotheses. The indicators are adapted from previous studies: perceived cost [13, 14], complicated checkout [4, 13, 15], emotional ambivalence [4, 12, 16], information overload [5, 13, 32], complicated return policy [25, 26, 33], limited shipping options [25, 33], and shopping cart abandonment [10, 14]. The answer questions are a 6-point Likert scale, from very disagree (1) to very agree (6).

Data screening and transformation are conducted using Ms. Excel for the data analysis protocol. The respondents' engagement is ensured in the completion of the questionnaire, and all negative questions are reversed before data analysis. The Partial Least Square (PLS) algorithm and bootstrapping techniques were conducted using the SmartPLS software, which facilitates data analysis and allows the assessment of the findings' robustness. Furthermore, the PLS algorithm assesses the validity and reliability of the first-order measurement model.

After completing the questionnaire, the discriminant validity is assessed using the Heterotrait-Monotrait (HTMT) ratio. Then, confirmatory factor analysis is conducted, and a bootstrapping procedure with 5,000 resamples is executed. The analysis of hypotheses

TABLE I  
DEMOGRAPHICS OF RESPONDENTS.

Item	Result
Age	
< 20	38
20–30	112
30–40	34
40–50	12
> 50	4
Gender	
Male	109
Female	91
Income	
< 5 million Rupiah	116
5–10 million Rupiah	62
10–30 million Rupiah	16
> 30 million Rupiah	6

involves examining t-values, p-values, and effect size. Furthermore, the Importance-Performance Map Analysis (IPMA) is performed using SmartPLS. IPMA allows the prioritization of actions by management based on two key dimensions: importance and performance. Significant areas that require attention and action are identified by evaluating these dimensions. As a result, it can focus primarily on improving the performance of critical constructs in explaining a specific target construct with poor performance.

### III. RESULTS AND DISCUSSION

As shown in Table I, among the 200 respondents, there are 109 males (54%), while the remaining 91 (46%) are female. The data indicate that men tend to abandon shopping carts more frequently than women. The age category shows 19%, 56%, 17%, 6%, and 2% falling under 20 years old, 20–30 years old, 30–40 years old, 40–50 years old, and more than 50 years old, respectively. In terms of geographic distribution, 63% of the respondents are from Jabodetabek, while the remaining 37% reside outside Jabodetabek. Based on their income levels, 58%, 31%, 8%, and 3% of the respondents report earning less than 5 million Rupiah, 5–10 million Rupiah, 10–30 million Rupiah, and more than 30 million Rupiah, respectively. It is worth noting that a significant majority of respondents (88%) have abandoned their shopping carts. Furthermore, this majority consists primarily of young people living in urban areas with lower income levels.

Table A1 in Appendix shows the results of the convergent validity test. The research uses the following cut-off values: factor loading  $\geq 0.5$  [22], Average Variance Extracted (AVE)  $\geq 0.5$  [23], and Composite Reliability (CR)  $\geq 0.9$  [25]. Meanwhile, nine indicators have been removed, namely PC1, CC3, IO1, IO2,

IO4, IO5, CP3, CP6, and LSO5, because the factor loading of those indicators does not pass the cut-off value. After removing nine indicators, all the AVE and CR of all variables pass the cut-off value.

Table II shows the discriminant validity test results. The HTMT criterion is used for assessing discriminant validity with a cut-off value  $\leq 0.90$  [34]. The maximum value of HTMT is 0.792. Meanwhile, the minimum HTMT value is 0.200. Therefore, the researchers conclude that the variables are not related to each other.

In PLS, the bootstrapping method is used to determine the path coefficient magnitude, and 5,000 bootstrap samples are made. With a 5% margin of error, the t- and p-values are used to determine when the regression coefficient values are statistically significant. The significance threshold of 5% specifies that the p-value must be less than 0.05, and the t-value must be more than 1.65 for the hypothesis to be accepted [22]. The effect size ( $f^2$ ) statistic measures the contribution of exogenous factors to endogenous variables. The intervals are as follows: high ( $f^2 > 0.350$ ), medium ( $f^2 > 0.150$ ), and small effects ( $f^2 > 0.020$ ) [35]. The research also uses a combination of criteria, such as p-values and effect sizes, to better understand the findings, as shown in Table III. From the results, complicated checkout ( $\beta = 0.313$ ;  $p < 0.001$ ; small effect), information overload ( $\beta = 0.282$ ;  $p < 0.001$ ; small effect), complicated return policy ( $\beta = 0.229$ ;  $p < 0.001$ ; small effect), and limited shipping option ( $\beta = 0.177$ ;  $p < 0.020$ ; small effect) affect shopping cart abandonment. Complicated checkout, information overload, complicated return policy, and limited shopping options explain 37.5% of the variation of shopping cart abandonment. Meanwhile, perceived cost and emotional ambivalence are not significant to the shopping cart abandonment.

First, H1 is rejected in line with previous study findings [7, 13, 14, 20]. Most E-commerce sites always offer cashback or free shipping to their customers. Cashback is given when the customer pays using a payment or logistics partner. Customers possess the option to cancel transactions when the overall cost of online purchases surpasses offline transactions. Since e-commerce consistently offers a wide range of cashback incentives, the total cost of online shopping tends to be more economical than offline alternatives. Therefore, perceived cost does not act as a trigger for shopping cart abandonment, rejecting H1 [11, 14, 16, 21, 22].

Second, H2 is accepted. The result is in line with previous studies [13, 15]. A complicated checkout is the most important factor in shopping cart abandonment. It is common for customers to abandon their shopping carts when they encounter dissatisfaction with the purchasing process [36]. Hence, e-commerce

TABLE II  
DISCRIMINANT VALIDITY TEST WITH HETEROTRAIT-MONOTRAIT (HTMT) VALUE.

	1	2	3	4	5	6	7
1 CC							
2 CP	0.231						
3 EA	0.352	0.219					
4 IO	0.200	0.274	0.547				
5 LSO	0.435	0.268	0.786	0.792			
6 PC	0.468	0.408	0.483	0.372	0.519		
7 SCA	0.456	0.288	0.337	0.433	0.514	0.281	

Note: PC= Perceived Cost, CC= Complicated Checkout, EA= Emotional Ambivalence, IO = Information Overload, CP = Complicated Return Policy, LSO = Limited Shipping Option, and SCA = Shopping Cart Abandonment.

TABLE III  
HYPOTHESIS TEST RESULTS.

Relationship	Std. $\beta$	STDEV	T-Value	P-Value	F <sup>2</sup>
H1: PC $\rightarrow$ SCA	-0.041	0.082	0.504	0.307	0.002
H2: CC $\rightarrow$ SCA	0.313	0.058	5.413	***	0.127
H3: EA $\rightarrow$ SCA	-0.044	0.084	0.524	0.300	0.002
H4: IO $\rightarrow$ SCA	0.283	0.062	4.551	***	0.086
H5: CP $\rightarrow$ SCA	0.229	0.066	3.493	***	0.072
H6: LSO $\rightarrow$ SCA	0.177	0.086	2.045	0.020	0.025

Note: PC= Perceived Cost, CC= Complicated Checkout, EA= Emotional Ambivalence, IO= Information Overload, CP= Complicated Return Policy, LSO = Limited Shipping Option, and SCA= Shopping Cart Abandonment.

Std.  $\beta$  = path coefficient, STDEV = standard deviation, and  $f^2$  = effect size

\*\*\* =  $p < 0.001$

R<sup>2</sup> of SCA is 0.375

needs to offer a variety of payment methods that cooperate with the banks or payment gateways owned by their customers [37]. It also needs to consider how to protect against data breaches during the checkout process [38].

Third, H3 is accepted. The result is in line with previous studies by [14, 16, 21]. Emotional changes during online shopping encourage customers to abandon the shopping cart [14]. Shopping cart abandonment can be attributed to emotions such as fear and sadness. During the online shopping experience, fear may arise due to privacy concerns, security concerns, negative reviews, or unfamiliarity with the products [39]. On the other hand, sadness can emerge when customers do not receive any rewards or incentives for repurchasing items, leading to a sense of disappointment and detachment from completing the transaction [40] or the absence of Cash on Delivery (COD) facilities for the initial online purchase [41].

Fourth, H4 is accepted. The result aligns with previous studies [4, 5, 13, 17]. Information overload emerges as the second most crucial aspect to consider when attempting to decipher why people abandon their shopping carts online. Customers can search for product information across various media channels during the search and selection phase of online shopping, thereby enhancing their purchase decision-making process [42]. In the usual course of events, customers put

the product in their cart while searching for it and reviewing the information during the checkout process. This process enables them to carefully evaluate the information before making their final decision [43]. After discovering a negative review of the product in the shopping cart, the customers proceed to remove the product [39].

Fifth, H5 is accepted in line with previous researchers [23–26]. A complicated return policy is considered the third important factor when understanding shopping cart abandonment in e-commerce. The customer is expected to review the product return regulations from the e-commerce provider and seller before checking out the transaction [44]. The product return regulation information can be obtained from the seller, the e-commerce page, or the product review page. Moreover, the seller's product warranty regulations should be reviewed before checking the transaction [45]. In the event of a product defect in the future, the customer must be aware of the procedures for returning the product and the terms and conditions associated with the warranty [25].

Last, H6 is accepted. The result aligns with previous studies [27–30, 33]. Limited shipping options are the least important factor in why people abandon shopping carts online. Customers need the logistic service provider information when selecting a product delivery service [46]. The information covers the service type,

estimated shipping price, and delivery time. Moreover, customers often tend to abandon their shopping carts upon discovering unfavorable reviews about the reputation of the logistic service. Consequently, it is crucial for sellers to evaluate their logistic service performance regularly [27]. Since customers typically have diverse preferences in selecting a logistic service, sellers must offer various credible logistic services as shipping options to cater to these varying preferences [47].

#### IV. CONCLUSION

In conclusion, complicated checkout, information overload, complicated return policies, and limited shipping options cause shopping cart abandonment. Meanwhile, perceived cost and emotional ambivalence have no impact. The research findings regarding customers abandoning their online shopping carts provide valuable opportunities for businesses and merchants. E-commerce companies should prioritize ensuring that their checkout process is user-friendly, secure, and tailored to meet the needs of their customers. This recommendation entails addressing essential elements like including all relevant product details in the cart, offering a variety of payment options, highlighting promotional offers, and providing convenient logistic service choices. Moreover, maintaining customers' privacy and security is of paramount importance, even in the era of cloud-based technology. The management must take stringent measures to safeguard customers' data and employ advanced security technologies.

E-commerce companies must also establish a robust merchant and product evaluation system to ensure optimal customer satisfaction. They must possess the requisite knowledge and skills for proficiently administering the rating and review system when merchants integrate into e-commerce platforms. Merchants are also expected to maintain high-quality standards and enhance customer confidence in products and services. The admin needs to respond to the review and formulate a strategy to improve service when a merchant obtains a negative review.

Next, e-commerce companies must provide product return and warranty information clearly and easily. They should strive to comprehend customers' distress when confronted with the need to return a defective product. By acknowledging customers' anguish, developers can effectively redesign the product return mechanism, mitigating complexities associated with the return process. Furthermore, merchants should conscientiously select logistics companies that have established partnerships with e-commerce platforms. E-commerce companies must also conduct regular evaluations of these logistics companies to ascertain the satisfaction of both customers and merchants.

The research contributes to the literature on shopping cart abandonment by advancing theory. However, it adopts a unique perspective by examining e-commerce in developing nations through the lens of users' emotions and experiences, e-commerce's regulations, and merchants' policies. This distinctive approach sets the research apart from previous analyses. The results show that shopping cart abandonment affects how the users feel during checkout. The research also examines return policies, information overload, and delivery options for online purchasing abandonment.

Despite utilizing these methods concerning online purchase behavior, their application to non-purchase activities remains unexplored. It is important to acknowledge the limitations inherent in the research. Moreover, the research is conducted solely in Jakarta, Bogor, Depok, Tangerang, and Bekasi, collectively known as Jabodetabek. The outcomes should only be extrapolated to the specific sample location under investigation. Therefore, future studies should expand the scope of the results beyond the confines of Jabodetabek. It is worth noting that customers may abandon their shopping cart or log off from the website or mobile application when further clarification is required for the final purchase. This behavior can result in the abandonment of shopping carts. Hence, exploring the impact of wish lists can uncover potential underlying connections. It is essential to highlight that the research solely focuses on online stores.

#### AUTHOR CONTRIBUTION

Writing—original draft: A. M. S., A. V. T., D. V. S., and Y. D. R.; Methodology, A. M. S., A. V. T., and D. V. S.; Formal analysis, A. M. S., and D. V. S.; Analysis result review, A. M. S., A. V. T., D. V. S., and Y. D. R. All authors have read and agreed to the published version of the manuscript.

#### REFERENCES

- [1] D. Coppola, "Number of digital buyers worldwide from 2014 to 2021 (in billions)," 2021. [Online]. Available: <https://www.statista.com/statistics/251666/number-of-digital-buyers-worldwide/>
- [2] H. Nurhayati-Wolff, "Annual Gross Merchandise Volume (GMV) of the e-commerce market in Indonesia from 2019 to 2023 with a forecast for 2030 (in billion U.S. Dollars)," 2023. [Online]. Available: <https://www.statista.com/statistics/1117608/indonesia-gmv-e-commerce-market/>

- [3] —, "Leading e-commerce sites in indonesia as of 2nd quarter 2022, by monthly traffic (in million web visits)," 2023. [Online]. Available: <https://www.statista.com/statistics/869700/indonesia-top-10-e-commerce-sites/>
- [4] M. Kukar-Kinney and A. G. Close, "The determinants of consumers online shopping cart abandonment," *Journal of the Academy of Marketing Science*, vol. 38, pp. 240–250, 2010.
- [5] J. D. Song, "A study on online shopping cart abandonment: A product category perspective," *Journal of Internet Commerce*, vol. 18, no. 4, pp. 337–368, 2019.
- [6] K. V. Gelder, "Online shopping cart abandonment rate in selected industries worldwide in 2022," 2024. [Online]. Available: <https://www.statista.com/statistics/457078/category-cart-abandonment-rate-worldwide/>
- [7] S. Moore and S. Mathews, "An exploration of online shopping cart abandonment syndrome—A matter of risk and reputation," *Journal of Website Promotion*, vol. 2, no. 1-2, pp. 71–88, 2008.
- [8] S. Chevalier, "Primary reason for digital shoppers worldwide to abandon their carts as of January 2019," 2023. [Online]. Available: <https://shorturl.at/elvQ0>
- [9] J. Duvall, "Shipping is critical to keeping online shoppers happy," 2019. [Online]. Available: <https://shorturl.at/iuxUV>
- [10] Y. Xu and J. S. Huang, "Factors influencing cart abandonment in the online shopping process," *Social Behavior and Personality: An International Journal*, vol. 43, no. 10, pp. 1617–1627, 2015.
- [11] M. F. M. Gustaman and C. K. Dewi, "Analisis faktor-faktor yang mendorong shopping cart abandonment," *eProceedings of Management*, vol. 6, no. 2, pp. 3895–3905, 2019.
- [12] J. Cho, "Likelihood to abort an online transaction: Influences from cognitive evaluations, attitudes, and behavioral variables," *Information & Management*, vol. 41, no. 7, pp. 827–838, 2004.
- [13] L. L. Yusuf, D. Tamara, and N. J. Setiadi, "The determinants for shopping cart abandonment," *Emerging Markets: Business and Management Studies Journal*, vol. 8, no. 2, pp. 89–107, 2021.
- [14] M. Erdil, "Factors affecting shopping cart abandonment: Pre-decisional conflict as a mediator," *Journal of Management Marketing and Logistics*, vol. 5, no. 2, pp. 140–152, 2018.
- [15] R. K. Rajamma, A. K. Paswan, and M. M. Hossain, "Why do shoppers abandon shopping cart? perceived waiting time, risk, and transaction inconvenience," *Journal of Product & Brand Management*, vol. 18, no. 3, pp. 188–197, 2009.
- [16] G. H. Huang, N. Korfiatis, and C. T. Chang, "Mobile shopping cart abandonment: The roles of conflicts, ambivalence, and hesitation," *Journal of Business Research*, vol. 85, pp. 165–174, 2018.
- [17] A. K. S. Ong, M. J. R. Dejucos, M. A. F. Rivera, J. V. D. J. Muñoz, M. S. Obed, and K. P. E. Robas, "Utilizing SEM-RFC to predict factors affecting online shopping cart abandonment during the COVID-19 pandemic," *Heliyon*, vol. 8, no. 11, pp. 1–13, 2022.
- [18] A. P. Kapoor and M. Vij, "Following you wherever you go: Mobile shopping 'cart-checkout' abandonment," *Journal of Retailing and Consumer Services*, vol. 61, 2021.
- [19] Y. Jiang, J. Shang, and Y. Liu, "Optimizing shipping-fee schedules to maximize e-tailer profits," *International Journal of Production Economics*, vol. 146, no. 2, pp. 634–645, 2013.
- [20] N. Sondhi, "Segmenting & profiling the deflecting customer: Understanding shopping cart abandonment," *Procedia computer science*, vol. 122, pp. 392–399, 2017.
- [21] Z. Bao and J. Yang, "Why online consumers have the urge to buy impulsively: Roles of serendipity, trust and flow experience," *Management Decision*, vol. 60, no. 12, pp. 3350–3365, 2022.
- [22] Q. Sun, R. K. Rajamma, D. D. Heisley, and M. A. Soliman, "Examining scarcity in mobile promotion and purchase intention: The role of location," *Journal of Marketing Theory and Practice*, vol. 30, no. 1, pp. 1–19, 2022.
- [23] M. Khouja, H. Ajjan, and X. Liu, "The effect of return and price adjustment policies on a retailer's performance," *European Journal of Operational Research*, vol. 276, no. 2, pp. 466–482, 2019.
- [24] L. Hsiao and Y. J. Chen, "Retailer's rationale to refuse consumer returns in supply chains," *Naval Research Logistics (NRL)*, vol. 62, no. 8, pp. 686–701, 2015.
- [25] A. S. Al-Adwan, M. K. Alrousan, H. Yaseen, A. M. Alkufahy, and M. Alsoud, "Boosting online purchase intention in high-uncertainty-avoidance societies: A Signaling theory approach," *Journal of Open Innovation: Technology, Market, and Complexity*, vol. 8, no. 3, pp. 1–20, 2022.
- [26] P. Oghazi, S. Karlsson, D. Hellström, and K. Hjort, "Online purchase return policy leniency and purchase decision: Mediating role of consumer trust," *Journal of Retailing and Consumer Services*, vol. 41, pp. 190–200, 2018.
- [27] Y. Jie, N. Subramanian, K. Ning, and D. Edwards, "Product delivery service provider selection and



- customer satisfaction in the era of Internet of things: A Chinese e-retailers' perspective," *International Journal of Production Economics*, vol. 159, pp. 104–116, 2015.
- [28] S. A. Hussain, R. V. Mani, and S. S. Chauhan, "Role of various determinants of trust influencing retailers' purchase intention for Fast Moving Consumer Goods (FMCG) from B2B e-commerce," *Specialusis Ugdyimas*, vol. 1, no. 43, pp. 1695–1712, 2022.
- [29] N. Vasić, M. Kilibarda, M. Andrejić, and S. Jović, "Satisfaction is a function of users of logistics services in e-commerce," *Technology Analysis & Strategic Management*, vol. 33, no. 7, pp. 813–828, 2021.
- [30] M. Revindran, P. N. K. Ragen, and B. Mahmud, "A study on logistics service quality in e-retailing amongst online shoppers in Kuala Lumpur," in *IOP Conference Series: Materials Science and Engineering*, vol. 780, no. 6. IOP Publishing, 2020, pp. 1–8.
- [31] J. M. Riley and R. Klein, "How logistics capabilities offered by retailers influence millennials' online purchasing attitudes and intentions," *Young Consumers*, vol. 22, no. 1, pp. 131–151, 2021.
- [32] D. Jiang, G. Zhang, and L. Wang, "Empty the shopping cart? The effect of shopping cart item sorting on online shopping cart abandonment behavior," *Journal of Theoretical and Applied Electronic Commerce Research*, vol. 16, no. 6, pp. 1973–1996, 2021.
- [33] B. Daroch, G. Nagrath, and A. Gupta, "A study on factors limiting online shopping behaviour of consumers," *Rajagiri Management Journal*, vol. 15, no. 1, pp. 39–52, 2021.
- [34] J. Henseler, C. M. Ringle, and M. Sarstedt, "A new criterion for assessing discriminant validity in variance-based structural equation modeling," *Journal of the Academy of Marketing Science*, vol. 43, pp. 115–135, 2015.
- [35] J. Cohen, *Statistical power analysis for the behavioral sciences*. L. Erlbaum Associates, 1988.
- [36] S. Mishra, G. Malhotra, and S. R. Tiwari, "Moderating effect of cognitive conflict on the relationship between value consciousness and online shopping cart abandonment," *The International Review of Retail, Distribution and Consumer Research*, vol. 31, no. 5, pp. 511–530, 2021.
- [37] M. K. S. Barbhai, Y. K. Sharma, and S. B. Sable, "A comprehensive study of barriers in electronic transactions for customers and banks," *Journal of Positive School Psychology*, vol. 6, no. 4, pp. 2332–2339, 2022.
- [38] S. B. B. Priyadarshini, "A comprehensive study of security in electronic commerce frameworks in the modern era of technology," in *Artificial intelligence and cybersecurity*. CRC Press, 2022, pp. 121–140.
- [39] F. Liu and A. Brandyberry, "Exploring the effects of aggregate review characteristics on mobile application adoption," in *Thirty Fifth International Conference on Information Systems, Auckland*, 2014, pp. 1–19.
- [40] S. Singh, "Impact of neuromarketing applications on consumers," *Journal of Business and Management*, vol. 26, no. 2, pp. 33–52, 2020.
- [41] K. W. Tham, O. Dastane, Z. Johari, and N. B. Ismail, "Perceived risk factors affecting consumers' online shopping behaviour," *The Journal of Asian Finance, Economics and Business*, vol. 6, no. 4, pp. 246–260, 2019.
- [42] B. Al Kurdi, M. Alshurideh, I. Akour, M. H. Alzoubi, B. Obeidat, and A. Alhamad, "The role of digital marketing channels on consumer buying decisions through eWOM in the Jordanian markets," *International Journal of Data and Network Science*, vol. 6, no. 4, pp. 1175–1186, 2022.
- [43] S. Lee and J. Y. Choeh, "The determinants of helpfulness of online reviews," *Behaviour & Information Technology*, vol. 35, no. 10, pp. 853–863, 2016.
- [44] C. Mondal and B. C. Giri, "Analyzing strategies in a green e-commerce supply chain with return policy and exchange offer," *Computers & Industrial Engineering*, vol. 171, 2022.
- [45] N. Chawla and B. Kumar, "E-commerce and consumer protection in India: The emerging trend," *Journal of Business Ethics*, vol. 180, no. 2, pp. 581–604, 2022.
- [46] K. Cao, Y. Xu, Q. Wu, J. Wang, and C. Liu, "Optimal channel and logistics service selection strategies in the e-commerce context," *Electronic Commerce Research and Applications*, vol. 48, 2021.
- [47] J. Karcz and B. Ślusarczyk, "Criteria of quality requirements deciding on choice of the logistic operator from a perspective of his customer and the end recipient of goods," *Production Engineering Archives*, vol. 27, no. 1, pp. 58–68, 2021.

## APPENDIX

The Appendix can be seen in the next page.

TABLE A1  
RESULTS OF OUTER LOADING, MEAN, CRONBACH’S ALPHA, AVERAGE VARIANCE EXTRACTED (AVE), AND COMPOSITE RELIABILITY (CR).

Variable	Items	Loading	Mean	AVE	CR
Perceived Cost	High shipping costs affect my shopping interest (PC 2)	0.586	5.300	0.559	0.862
	The total cost of shopping affects my shopping decisions (PC 3)	0.836	5.030		
	Discounts are important to me in online shopping (PC 4)	0.803	5.075		
	Discounted shipping costs are essential to me (PC 5)	0.752	5.240		
	I will continue buying if there is a free shipping option (PC 6)	0.735	5.300		
Complicated Checkout	I am satisfied with the buying process in e-commerce (CC 1)	0.768	2.575	0.568	0.835
	The e-commerce application uses a bank account that I do not have (CC 2)	0.868	2.675		
	I am worried about my data leaking when I buy things in e-commerce (CC 4)	0.824	3.120		
	I find it difficult to pay with a credit card (CC 5)	0.501	4.470		
	Incomplete payment methods will cancel my intention to continue the checkout process (CC 6)	0.768	2.575		
Complicated Return Policy	The return regulations in e-commerce affect my interest in making a purchase (CP 1)	0.577	3.720	0.551	0.824
	The regulation of returning goods in e-commerce affects my interest in purchasing (CP 2)	0.556	3.405		
	Product warranty regulations in e-commerce affect my interest in making a purchase (CP 4)	0.903	3.105		
	Complicated return regulations affect my interest in completing the purchase (CP 5)	0.863	2.875		
Emotional Ambivalence	Emotions significantly affect my shopping interest (EA 1)	0.881	4.175	0.673	0.925
	Feelings of pleasure affect my shopping interest (EA 2)	0.849	4.590		
	Feelings of sadness affect my shopping interest (EA 3)	0.798	4.000		
	Emotional changes will affect my shopping interest (EA 4)	0.874	4.340		
	I am hesitant to complete my purchase (EA 5)	0.764	4.270		
Information Overload	I have ever put items into an online shopping cart based on my mood (EA 6)	0.744	3.645	0.599	0.817
	I like to put multiple items of the same type into an online shopping cart (IO 3)	0.829	4.400		
	I have ever left items in my online shopping cart when I see bad reviews from other consumers (IO 6)	0.760	4.820		
	I have never bought an item even though I have been looking for as much information as possible about the item (IO 7)	0.730	5.080		
Limited Shopping Option	I never find information about the delivery service I want (LSO 1)	0.643	4.050	0.545	0.826
	Cash on Delivery (COD) is my consideration in buying (LSO 2)	0.770	4.865		
	The unavailability of the shipping option that I want keeps me from completing the purchase (LSO 3)	0.797	4.355		
	I do not complete the purchase if the delivery service used has a bad reputation (LSO 4)	0.733	4.120		
Shopping Cart Abandonment	I have ever put an item in my online shopping cart on E-commerce and do not buy it (SCA 1)	0.792	5.315	0.711	0.925
	I have ever ignored items in my e-commerce online shopping cart (SCA 2)	0.888	5.370		
	I do not always buy things I already put in my shopping cart (SCA 3)	0.864	4.890		
	I sometimes leave items in my online shopping cart without buying them (SCA 4)	0.761	5.020		
	Items that I put in my online shopping cart may not be purchased (SCA 5)	0.902	4.830		