

From 99+ to checkout: can a simple social nudge change everything?

Iisnawati, Hera Febria Mavilinda, Yulia Hamdaini Putri

Faculty of Economics, Universitas Sriwijaya, South Sumatera, Indonesia

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Abstract

High cart abandonment rates remain a major challenge in e-commerce, despite the continued growth of online shopping in Indonesia. Many consumers then add products to their shopping carts without completing the checkout process until they have more than 99 items, prompting a 99+ notification. This transaction delay stems from uncertainty, perceived risk, and low trust in online transactions. In this context, social proof nudges emerge as a form of digital intervention with the potential to drive consumer purchasing decisions. Therefore, this study aims to analyze the influence of social proof nudges on purchasing decisions through trust in the e-commerce context. This study used a quantitative approach with primary data obtained from 200 e-commerce users in Indonesia through a purposive sampling technique. Data analysis was conducted using the PLS-SEM method with the assistance of SmartPLS 4. The results show that social proof nudges significantly influence trust and purchase decisions. Furthermore, trust also significantly influences purchase decisions and partially mediates the relationship between social proof nudges and purchase decisions. This research contributes to the development of digital consumer behavior literature by integrating Nudge Theory, Social Norm Theory, and trust to explain e-commerce purchasing decisions and practically reducing cart abandonment in e-commerce.

Keywords: *cart abandonment, digital nudge, e-commerce, social proof, trust.*

Introduction

The development of digital technology has transformed consumer-business interactions, particularly in e-commerce. The online shopping trend in Indonesia continues to grow, driven by increased internet penetration, greater mobile access, and a shift in consumer preferences toward more efficient, practical online shopping. Data shows that e-commerce users have steadily increased from 2020 to 2023, reaching 58.63 million, and are predicted to continue growing (Mirbabaie et al., 2023). This data demonstrates the significant potential of the Indonesian online market.

Despite this high potential, e-commerce players still face significant challenges, one of which is cart abandonment, a phenomenon in which consumers add products to their carts without completing the transaction. In the Indonesian e-commerce context, consumers frequently accumulate large numbers of products in their shopping carts, often reflected in platform notifications such as "99+," which indicates that the consumer has placed more than 99 items in their cart that remain unpurchased. This phenomenon illustrates a growing tendency among consumers to postpone checkout decisions despite showing strong initial purchase interest (cart abandonment). Previous research on cart abandonment in Indonesian e-commerce showed that 88% of respondents had abandoned their carts (Sundjaja et al., 2024). Based on data, online shopping cart abandonment in the Asia-Pacific

(APAC) region was 87% in the fourth quarter of 2024. Meanwhile, the worldwide online shopping cart abandonment rate was 70.19% in 2025 (SellerCommerce, 2026; statista.com, 2026). According to this report, the rate of online shopping cart abandonment will increase to 70.22% in 2026. This figure reflects a complex and profound issue in consumer psychology, including distrust, uncertainty, and risk perception. To address consumer uncertainty during online shopping, e-commerce platforms are increasingly using various forms of social influence cues. One of the most common approaches is social proof, which refers to information about other consumers' behaviour and evaluations, such as product ratings, customer reviews, purchase counts, and "best-selling" labels. These cues provide social validation and help consumers evaluate products when direct product inspection is not possible. Consequently, social proof has become an essential feature of contemporary e-commerce platforms and is often used to support consumer decision-making.

Cart abandonment is a form of delay in consumer purchasing decisions. This delay can occur due to consumer distrust, uncertainty, and risk perception. Therefore, to minimize cart abandonment, interventions that can increase consumer trust are necessary. In this context, implementing a behavioral approach through Nudge Theory can be an alternative solution to this problem. According to (Thaler & Sunstein, 2008), nudges are part of choice architecture that can predictively influence individual behavior without restricting freedom of choice or significantly altering economic incentives. Thaler and Sunstein also explain that individuals often make decisions based on heuristics, social influence, inertia, and status quo bias, especially in complex and uncertain situations. Therefore, the way information is presented on digital platforms can function as behavioral cues that direct consumers to certain decisions. Nudge Theory argues that small changes in the way choices are presented can influence consumer decisions without eliminating freedom of choice (Thaler & Sunstein, 2008; Venema et al., 2020). Among the various forms of digital nudges, social proof is particularly relevant in e-commerce because it provides consumers with behavioral cues derived from the experiences and actions of other users.

Social proof is a psychological phenomenon in which individuals tend to imitate others' actions in uncertain situations (Park & McCallister, 2023). In the context of e-commerce, social proof can take the form of customer reviews, product ratings, number of buyers, or "Best-selling Product" labels. Social proof not only serves as social validation but also enhances trust, which is a powerful factor in influencing online purchasing decisions (Yuswanto et al., 2024). Social proof nudge has strategic potential to build trust, which in turn can reduce uncertainty and minimize the risk of cart abandonment, thereby strengthening purchasing decisions.

This study integrates Nudge Theory and Social Norm Theory to explain how social proof influences consumer behavior on digital platforms. Nudge Theory explains that consumer decisions can be influenced by behavioral cues without limiting consumer freedom of choice (Thaler & Sunstein, 2008). Meanwhile, Social Norm Theory emphasizes that individuals tend to follow the behavior and judgments of others when faced with uncertainty (Cialdini et al., 1991). In the context of e-commerce, social proof indicators such as ratings, customer reviews, and number of buyers serve not only as sources of information but also as normative signals that shape consumer trust and purchasing decisions. Therefore, trust is an important psychological mechanism linking social proof nudges to consumer purchasing decisions in online transactions.

Literature Review

The Social Proof Nudge construct describes a form of digital behavioral intervention in the form of social cues displayed on e-commerce platforms to indirectly influence consumer behavior. In the e-commerce context, social proof can take the form of the number of reviews, product ratings, number of buyers, number of likes, or recommendations from experts or specific figures that consumers use as references when evaluating products online (Nikmah & Zaidah, 2022). Previous research also shows that social proof is a form of digital nudge that can influence consumer behavior and purchasing decisions in the digital environment (Park & Mccallister, 2023). Therefore, the Social Proof Nudge construct in this study is measured using indicators such as the number of reviews, rating level, number of likes, number of buyers, and expert reviews.

H1: Social Proof Nudge has significant influence to Trust.

The trust construct describes a consumer's level of confidence in a product, seller, or e-commerce platform after receiving exposure to social proof. Trust is a crucial factor in online transactions because consumers cannot evaluate products directly, so purchasing decisions are heavily influenced by their level of confidence in the seller's credibility and transaction security (Faradhilla et al., 2024). Previous research also explains that trust plays a mediator between digital marketing features and consumer purchasing decisions in e-commerce (Rosa et al., 2018). In this study, the Trust construct is measured using indicators of credibility, benevolence, and the ability of the other party.

H2: Trust has significant influence to Purchase Decision.

Meanwhile, the Purchase Decision construct describes a consumer's actual decision to proceed with the checkout process and complete a purchase transaction on an e-commerce platform. Purchasing decisions in the digital environment are influenced by various psychological and social factors, particularly when consumers face uncertainty about the product or seller. Previous research shows that social proof and trust have a significant influence on shaping purchase decisions in online transactions (Yuswanto et al., 2024). The Purchase Decision construct in this study was measured using indicators of need recognition, information search, alternative evaluation, purchasing decision, and post-purchase behavior.

H3: Social Proof Nudge has direct significant influence to Purchase Decision.

Although previous research has addressed social proof, trust, and online purchasing behavior separately, there is limited research that integrates these variables into a comprehensive digital nudge framework, particularly in the context of cart abandonment behavior. Previous research has not yet combined Nudge Theory, Social Norm Theory, and trust into a comprehensive model of digital consumer behavior. Most of them focuses on purchase intention or impulse buying, while the psychological mechanisms explaining how social proof nudges can reduce consumer hesitation during the checkout process remain largely unexplored. Therefore, this study contributes by integrating Nudge Theory, Social Norm Theory, and trust into a single model of digital consumer behavior to explain how social proof nudges influence consumer purchasing decisions in e-commerce.

The novelty of this study lies in the placement of trust as a mediating mechanism that

explains the transformation of social cues into actual purchasing decisions in online shopping environments. This novelty involves a digital nudge-based intervention to reduce impulse buying, emphasizing the importance of trust in fostering consumer engagement and mitigating the risks of e-commerce purchases.

The urgency of this research is the high rate of cart abandonment in e-commerce. This high rate of cart abandonment results in a potential loss of \$18 billion in e-commerce revenue, or 0.3% of total e-commerce revenue annually (Faradhilla et al., 2024). Therefore, appropriate strategies are needed to minimize cart abandonment in e-commerce, one of which is digital intervention in the form of social proof nudges. Based on this background, this study examines the Influence of the social proof nudge strategy, as a form of digital nudge, on consumer purchasing decisions in e-commerce and whether the trust variable can mediate the relationship between social proof nudge and purchasing decisions.

The relationship between these variables in this study explains that the stronger the social proof received by consumers, the higher their level of trust in the product and e-commerce platform. This increased trust will further strengthen consumers' purchasing decisions. Furthermore, social proof is also assumed to have a direct influence on purchasing decisions because the presence of reviews, ratings, and the number of buyers can function as heuristic cues that help consumers make decisions more quickly amidst the uncertainty of online transactions. Thus, Trust is positioned as a psychological mechanism that mediates the relationship between Social Proof Nudge and Purchase Decision in the context of digital consumer behavior. Based on the relevant previous research, a research framework was formed which can be seen in figure below:

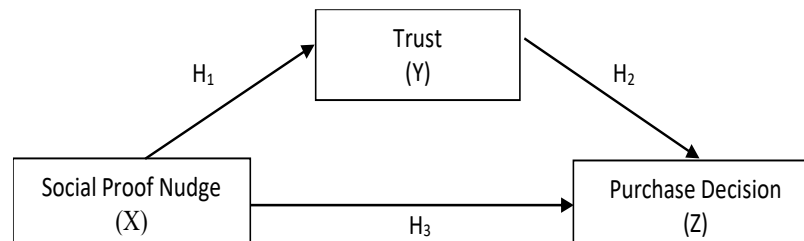


Figure 1. Research Framework

Methods

This research is a causal quantitative study, where the approach seeks causal relationships between one variable and another. This study tests the established hypotheses and examines the influence of the independent variables on the dependent variable. The study examines the relationship between social proof nudges and purchasing decisions through trust. This study uses primary data by distributing questionnaires to 200 e-commerce users with products in their carts that have not yet been checked out. The research object is e-commerce in Indonesia.

The population of this study is e-commerce users in Indonesia. Because the exact number of e-commerce users in Indonesia is an unknown population, then the minimum sample size was initially calculated using the Lemeshow formula. In calculating the sample size, the confidence level is 90% = 1,645. Because the value of P in the population is unknown, the largest sample size is chosen, namely P = 0,5. Meanwhile, for precision or alpha, d=0.1, or 10% of the 90% confidence level (the precision range is usually 0,01-0,25). After entering

the numbers into the formula, $n=67,5$. Based on this formula, the minimum sample size is 68 respondents. The calculation results showed that the minimum sample size required was 68 respondents. However, this study used the Partial Least Squares Structural Equation Modeling (PLS-SEM) method, which requires an adequate sample size to achieve model stability and better predictive accuracy. Therefore, the number of respondents was increased to 200 to meet the sample size recommendations in PLS-SEM analysis, especially for research models involving multiple constructs and mediation testing. The use of PLS-SEM was deemed appropriate because this study is predictive and exploratory in explaining the relationship between digital consumer behavior variables.

The sampling method used was non-probability sampling with a purposive sampling technique. The selected research respondents had to meet the following criteria: 1). User of Indonesian e-commerce; 2) Have an online cart with non-checked-out products; 3). Resident in Indonesia. The sampling procedure involved distributing an online questionnaire through Google Forms to e-commerce users in Indonesia. Before answering the main questionnaire, respondents completed screening questions to confirm that they met the research criteria. Those who did not meet the criteria could not continue. This step ensured that the data came from consumers with experience in the cart abandonment phenomenon. After screening, respondents completed all questions related to Social Proof Nudge, Trust, and Purchase Decision. All collected data were then re-screened for completeness before analysis using the PLS-SEM method.

The research instrument was developed by adapting indicators from previous research related to social proof, trust, and online purchasing decisions. The social proof nudge was measured through indicators that describe consumers' perceptions of reviews, ratings, and the number of buyers on e-commerce platforms. These indicators were used to capture the social proof nudge construct. The trust construct was measured through indicators related to the credibility, security, and reliability of online transactions. These indicators were used to capture the trust construct. Meanwhile, the purchase decision construct was measured based on consumers' tendency to complete the checkout process after evaluating product information. These indicators were used to capture the purchase decision construct. Respondents' responses were measured using a differential scale containing numbers from 1 to 5, with each pole having a consistent positive and negative pole. The use of reflective constructs and five-point scales is considered appropriate for PLS-SEM-based consumer behavior research.

This study uses three main constructs: Social Proof Nudge as the independent variable, Trust as the mediating variable, and Purchase Decision as the dependent variable. The relationships between the constructs are developed based on the integration of Nudge Theory and Social Norm Theory in the context of digital consumer behavior on e-commerce platforms.

Result and Discussions

Data analysis was conducted using the Partial Least Squares Structural Equation Modeling (PLS-SEM) method to test the effect of Social Proof Nudge (SOC) on Trust (TRU), the effect of Trust on Purchase Decision (PUR), and the direct effect of Social Proof Nudge on Purchase Decision. The analysis also continued by testing the mediating role of Trust in the relationship between Social Proof Nudge and Purchase Decision.

The results of the convergent validity evaluation show that all constructs have an Average Variance Extracted (AVE) value above 0,50, which is the minimum requirement for meeting convergent validity.

Tabel 1. AVE

Construct	Cronbach's Alpha	CR	AVE
SOC	0,870	0,907	0,662
TRU	0,904	0,940	0,839
PUR	0,928	0,946	0,778

The AVE values for all constructs are in the range of 0.662–0.839, which proves that the indicators are able to explain the construct variance adequately. The Cronbach's Alpha and Composite Reliability (CR) values for all constructs were above 0,70, indicating excellent internal consistency.

Table 2. Outer Loading Value

Variables	Item	Outer Loading Value	Description
Social Proof Nudge (SOC)	SOC1	0,860	Valid
	SOC2	0,846	Valid
	SOC3	0,761	Valid
	SOC4	0,873	Valid
	SOC5	0,716	Valid
Trust (TRU)	TRU1	0,934	Valid
	TRU2	0,918	Valid
	TRU3	0,896	Valid
Purchase Decision (PUR)	PUR1	0,854	Valid
	PUR2	0,903	Valid
	PUR3	0,923	Valid
	PUR4	0,911	Valid
	PUR5	0,816	Valid

All indicators had higher loadings on the original construct than on the other constructs. This indicates that each indicator accurately measures the intended variable and there is no overlap between constructs. Based on the Fornell-Larcker Criterion, the square root of the AVE for each construct is higher than its correlation with other constructs, thus meeting discriminant validity. Based on these test results, all indicators are valid and reliable, thus the measurement model is deemed suitable for further structural model analysis.

Tabel 3. R-Square Value

Construct	R ²	R Adjusted
TRU	0.667	0.665
PUR	0.801	0.799

The R² value for the Purchase Decision construct (0.801) is strong, indicating that SOC and TRU explain 80.1% of the variance in purchasing decisions. The R² value for trust (0.667) is moderate, indicating that Social Proof Nudge is quite strong at explaining the formation of consumer trust. The loading factor and R² values can be seen in the following figure:

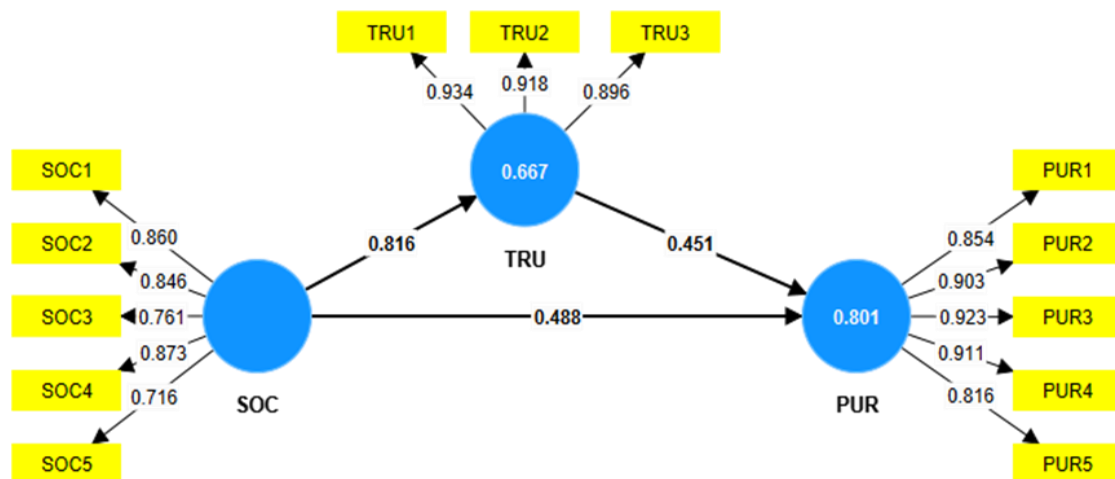


Figure 2. Loading Factor and R² Value

Based on the results of the analysis using Partial Least Squares-Structural Equation Modeling (PLS-SEM), this study aims to empirically prove that all hypotheses are accepted. The results of the hypothesis test can be seen in Table 4 below:

Table 4. Outer Loading Value

Hypotheses	Path	T-Statistic	P-Value	Result
H ₁	SOC → PUR	5,611	0,000	Accepted
H ₂	SOC → TRU	17,339	0,000	Accepted
H ₃	TRU → PUR	0,4990	0,000	Accepted

The results indicate that the social proof-trust pathway has the strongest effect ($\beta = 0.816$), underscoring the critical role of social proof in shaping consumer trust in e-commerce.

Table 5. Indirect Effect

Path	T-Statistic	P-Value
SOC → TRU → PUR	5,137	0,000

Based on the research results, it is known that the indirect effect is significant with $t > 1.96$, so Trust mediates the relationship between SOC → PUR. Since the direct effect of SOC → PUR is also significant, the mediation is partial mediation. This finding aligns with Nudge Theory, which posits that social proof serves as an informational nudge, guiding consumer decision-making by leveraging observable cues about others' actions (Thaler & Sunstein, 2008). In digital environments, visual cues such as star ratings and customer reviews serve as cognitive shortcuts that reduce processing effort and uncertainty (Huang et al., 2025), further amplifying the influence of social proof on trust.

The result is also consistent with Social Norm Theory, which emphasizes the role of descriptive norms formed through collective user behavior in shaping individual judgments (Cialdini et al., 1991). In the e-commerce context, these norms manifest through aggregated social proof indicators such as the number of likes, reviews, and buyers, which signal that a product or seller is widely accepted and trustworthy. Consequently, these indicators

enhance perceived credibility and influence consumers' psychological beliefs regarding product legitimacy and seller reliability (Usman & Wijaya, 2025).

In the context of e-commerce, indicators such as high ratings, numerous reviews, and large numbers of buyers signal that a product is commonly accepted and trusted by others, thereby shaping consumers' psychological beliefs regarding product credibility and seller reliability (Cheung et al., 2008; Filieri et al., 2014). Thus, social proof not only affects observable behavior but also strengthens internal beliefs related to trust.

The effect of trust on purchase decisions ($TRU \rightarrow PUR$) is also significant ($\beta = 0.451$), reaffirming the centrality of trust in online market transactions. It corroborates meta-analytic evidence demonstrating that trust consistently exerts a positive influence on purchase intention across social commerce and e-commerce platforms (Wang et al., 2022). Consumers tend to complete purchases when they perceive accurate product information, secure transactions, and trusted sellers (Pavlou, 2003), especially in digital environments characterized by spatial and temporal separation.

Moreover, the study shows that strong social proof indicators correlate with increased consumer trust. This study demonstrates that the stronger the social proof indicators, such as the number of positive reviews, high ratings, and the number of buyers, the higher the level of consumer trust in the product and seller. It is consistent with recent findings that online reviews and ratings significantly influence purchasing behavior by building confidence and reducing perceived risk (Rachmiani et al., 2024). This finding also supports Social Norms Theory, which states that individuals tend to follow the majority's behavior as a basis for assessing trustworthiness.

Significantly, social proof also directly influences purchase decisions. It supports prior research demonstrating that social proof elements, such as user-generated reviews and aggregated ratings, serve as strong predictors of consumer choices (Nurdin et al., 2025). This finding aligns with Nudge Theory, which holds that simple cues, such as reviews or ratings, can drive decisions without coercion or explicit rules (Thaler & Sunstein, 2008).

This study further reveals that trust partially mediates the relationship between social proof and purchase decisions. Previous Research has similarly shown that trust plays a mediating role between electronic word of mouth (eWOM) and purchase intentions (Rosa et al., 2018), and more recent analyses suggest that mediation mechanisms such as trust, perceived risk reduction, and emotional responses influence purchase outcomes in e-commerce (Anastasiei et al., 2025).

Additionally, the findings highlight the importance of social proof in reducing cart abandonment. Prior studies identify uncertainty and lack of trust as major antecedents to cart abandonment (Thakur & Sankala, 2024). Strong social proof reduces ambiguity and perceived risk, thereby increasing consumers' confidence to complete the purchase. This study's findings align with both Nudge Theory and Social Norm Theory, demonstrating that social proof nudges not only trigger immediate behavioral responses but also shape deeper psychological constructs, such as trust, that underpin consumer decision-making in e-commerce.

The finding is relevant in the context of high cart abandonment rates, which occur when consumers add a product to their cart but do not complete the transaction. The global cart abandonment rate of over 70% indicates that consumers often abandon their carts due to uncertainty or doubt. Previous studies have shown that one of the main causes of cart

abandonment is uncertainty, doubts about product quality, and a lack of trust in the seller or platform. In e-commerce, information such as "*best-selling product*", "*15,000 positive reviews*" or "*expert recommended*" serves as a subtle nudge that helps consumers quickly assess product quality. When social proof is strong, consumers perceive the product as safe, popular, and validated by other buyers. It reduces the need for consumers to seek additional information, thereby delaying purchase decisions.

Overall, the results of this study suggest that social proof is not merely supplementary information but a psychological mechanism that reduces uncertainty, strengthens quality perceptions, and provides social validation. Consequently, social proof functions as an effective behavioral intervention that addresses the underlying causes of cart abandonment. These findings confirm that strategies aimed at increasing social proof on e-commerce platforms can serve as an effective approach to enhancing purchase decisions and reducing cart abandonment rates.

Conclusion

This study demonstrates that the stronger the social proof indicators, such as the number of positive reviews, high ratings, and number of buyers, the higher the level of consumer trust in the product and seller. This finding supports Social Norms Theory, which states that individuals tend to follow the behavior of the majority as a basis for assessing trustworthiness. Furthermore, the research results conclude that social proof provides a direct incentive for consumers to make a purchase. This finding aligns with Nudge Theory, which states that simple cues such as reviews or ratings can encourage decisions without coercion or explicit rules.

The results of this study also indicate that trust is a crucial element in shaping purchasing decisions. When consumers believe that a seller and product are reliable, their probability of purchasing increases significantly. This trust has also been shown to be a significant mediator in the relationship between Social Proof Nudge and Purchase Decisions.

Although this study provides important findings, it still has limitations. This research focused only on e-commerce consumers in Indonesia, so the results may not necessarily represent consumer behavior across different cultural and regional contexts. Furthermore, this study focused solely on social proof and trust variables.

Therefore, future research is recommended to expand the scope of the study by involving consumers from different countries or digital platforms to improve the generalizability of the results. Furthermore, future research can develop a more comprehensive research model by incorporating other psychological and technological variables related to cart abandonment behavior and digital consumer decision-making.

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