

SCROLL, STREAM, AND SHOP: THE EFFECT OF LIVE STREAMING AND FLASH SALES ON IMPULSE BUYING THROUGH E-WOM AMONG SHOPEE GENERATION Z USERS IN SURABAYA



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Abstract

This study analyzes the influence of Flash Sale and Live Streaming on Impulse Buying with Electronic Word of Mouth (E-WOM) as a mediating variable among Shopee Generation Z users in Surabaya. Based on the Stimulus–Organism–Response (SOR) theory, data from 120 respondents were analyzed using PLS-SEM through SmartPLS 4.0. The results showed that Live Streaming had a positive and significant influence on Impulse Buying, while Flash Sale had no direct influence. Both Flash Sale and Live Streaming significantly influenced E-WOM, which in turn had a strong influence on Impulse Buying. E-WOM also acted as a mediator in the relationship between Flash Sale and Live Streaming on Impulse Buying. These findings strengthen the application of SOR theory in the context of young digital consumer behavior, highlighting the importance of trust-based interactive promotions to encourage impulsive buying.

Keywords: Flash Sale, Live Streaming, E-WOM, Impulse Buying, Generation Z

INTRODUCTION

The development of digital technology has driven a major transformation in consumer patterns, particularly in the e-commerce sector. Indonesia has become one of the fastest-growing e-commerce markets in the world, marked by increasing internet penetration, the number of active users, and a shift in people's lifestyles toward digital transactions. According to Katadata (2025), Shopee ranks first as the most frequently accessed e-commerce platform by Indonesians, surpassing Tokopedia and Lazada. Shopee's dominance is due not only to its extensive network of sellers and products, but also to its digital marketing strategy, considered most adaptive to young consumer behavior.

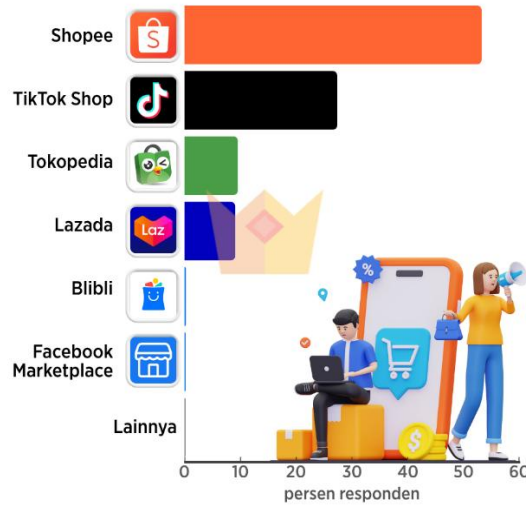


Figure 1. E-Commerce Platform Rankings Based on Number of Visitors in Indonesia in 2025

Source: Katadata Databox (2025)

One of Shopee's leading strategies is utilizing flash sales and live streaming as a form of interactive marketing innovation. Flash sales offer limited-time discounts, creating a sense of urgency and scarcity, potentially encouraging impulse buying. Meanwhile, live streaming allows sellers to interact directly with buyers in real-time, providing product demonstrations and creating an emotional connection that strengthens purchase intentions. Nurhaliza and Kusumawardhani (2023) demonstrated that live streaming increases consumer trust and positive emotions, while Fitriana and Istiyanto (2024) found that flash sales significantly influence unplanned purchasing decisions. However, Mutaqin (2024) noted that the effect of flash sales can diminish if not supported by social stimuli such as reviews or recommendations from other users.

In the digital context, user interaction also plays a significant role through electronic word of mouth (e-WOM). E-WOM is a form of consumer communication that occurs online through product reviews, comments, or recommendations. Purbasari and Respati (2024) found that e-WOM has a positive influence on impulse buying because it can foster trust in a product and strengthen purchasing decisions. Uberall's (2024) report even shows that 89% of global consumers read online reviews before purchasing a product, indicating that online shopping behavior is now heavily influenced by digital opinions..

While various previous studies have examined the influence of live streaming, flash sales, and e-WOM on impulse buying, the results remain inconsistent. Most studies focus on platforms like TikTok Shop or Shopee in general, without specifically examining the Generation Z population in Surabaya, a user group known for being impulsive, responsive to visual promotions, and actively sharing experiences through social media. Furthermore, previous studies have rarely examined the role of e-WOM as a mediating variable that bridges the influence of promotional stimuli on consumer impulsive behavior.

To address this research gap, this study uses the Stimulus–Organism–Response (SOR) Theory as a conceptual framework. This theory explains that consumer behavior is formed through three stages, namely external stimuli (S) in the form of digital promotional strategies such as flash sales and live streaming, organisms (O) as internal psychological reactions of consumers which in this study are represented by E-WOM, and responses (R) in the form of impulse buying behavior. The application of the SOR theory is considered relevant because it is able to explain the psychological process that connects digital promotions with spontaneous purchasing actions, especially in Generation Z who tend to be reactive to visual and social interactions on online platforms.

Based on the description, this study aims to analyze the influence of flash sales and live streaming on impulse buying with E-WOM as a mediating variable on Shopee Generation Z users in Surabaya. Theoretically, this study contributes to expanding the application of SOR theory in the context of digital consumer behavior in Indonesia, while practically, the results are expected to provide input for Shopee and other e-commerce players in designing more effective digital marketing strategies in attracting the attention of young consumers.

REVIEW OF LITERATURE

Flash Sale

A flash sale is a promotional strategy with significant price cuts for a limited time to create urgency and scarcity. Park and Lennon (2009) refer to it as a limited-time promotion, which triggers time pressure and scarcity perception, thus encouraging quick purchasing decisions. In e-commerce, this feature effectively increases the emotional urge to purchase without planning (Fitriana & Istiyanto, 2024). Key indicators of a flash sale include time urgency, product scarcity, and attractiveness.

Live Streaming

Live streaming marketing is a broadcast-based promotion that enables real-time interaction between sellers and buyers. Xu et al. (2020) explain that interactivity and social presence in live streaming increase consumer trust and positive emotions. In the context of Shopee, the Shopee Live feature provides an immersive shopping experience and encourages spontaneous decisions (Nurhaliza & Kusumawardhani, 2023). Indicators include interactivity, host credibility, and entertainment experience.

E-WOM

E-WOM is consumer communication on digital media in the form of product reviews, comments, or recommendations. Hennig-Thurau et al. (2004) define it as the spread of positive or negative opinions about products via the internet. Purbasari and Respati (2024) found that e-WOM increases trust and strengthens online consumers' purchase intentions. In this study, e-WOM indicators include message intensity, credibility, and valence.

Impulse Buying

Impulse buying is a spontaneous, unplanned purchase triggered by an emotional impulse. Rook (1987) explains that this behavior occurs suddenly and is often accompanied by a strong desire to own the product immediately. In e-commerce, promotional stimuli such as flash sales and live streaming are key triggers (Chen et al., 2021). Indicators include sudden, unplanned purchases and positive emotional impulses.

Stimulus–Organism–Response (SOR) Theory

The Stimulus–Organism–Response (SOR) theory proposed by Mehrabian and Russell (1974) explains that external stimuli (stimulus) influence an individual's internal reactions (organism), which then result in certain behaviors (responses). In the context of this research, Flash Sale and Live Streaming act as stimuli, E-WOM as an organism representing consumers' psychological and social reactions, and Impulse Buying as a response in the form of spontaneous purchasing behavior. This theory is used to explain how digital promotions can trigger internal reactions that encourage consumers' impulsive behavior.

RESEARCH METHOD

This study uses a quantitative approach to analyze the influence of flash sales and live streaming on impulse buying through electronic word of mouth (e-WOM) among Generation Z Shopee users in Surabaya. Primary data was obtained through an online questionnaire (Google Form) distributed online in October 2025 to Shopee users aged 13–28 years residing in Surabaya. The sampling technique used was purposive sampling, with respondents having shopped through the flash sale or live streaming feature at least once in the past three months.

Variables are measured using several indicators, flash sales are measured through promotional frequency, attractiveness, and accuracy (Tjiptono in Fitriana & Istiyanto, 2024), live streaming through interactions between consumers, real-time, and functions as a promotional tool (Fitriyani et al. in Rahmadani & Cempena, 2024), E-WOM through clarity, relevance, and credibility of messages, frequency of information dissemination, and data reliability (Darma in Pitriani, 2021), and impulse buying through sudden transactions, not considering the consequences, and hasty transactions (Yistiani et al. in Rohmah, 2022).

The sample size was set at 120 respondents, referring to Hair et al.'s (2021) guidelines, which required a minimum of five times the number of indicators, thus ensuring representativeness. Data analysis was performed using Partial Least Squares–Structural Equation Modeling (PLS-SEM) using SmartPLS 4.0 to test direct and indirect relationships between variables through the outer and inner model stages. Respondent demographic analysis was supported by descriptive data processing using SPSS.

Research Hypothesis

This study aims to analyze the influence of Flash Sales and Live Streaming on Impulse Buying, with Electronic Word of Mouth (E-WOM) as a mediating variable among Shopee Generation Z users in Surabaya. Based on the literature review and previous research, the hypotheses proposed in this study are as follows:

- H1: Flash Sales have a positive and significant effect on Impulse Buying.
- H2: Live Streaming has a positive and significant effect on Impulse Buying.
- H3: Flash Sales have a positive and significant effect on Electronic Word of Mouth (E-WOM).

- H4: Live Streaming has a positive and significant effect on Electronic Word of Mouth (E-WOM).
- H5: Electronic Word of Mouth (E-WOM) has a positive and significant effect on Impulse Buying.
- H6: Electronic Word of Mouth (E-WOM) mediates the effect of Flash Sales on Impulse Buying.
- H7: Electronic Word of Mouth (E-WOM) mediates the effect of Live Streaming on Impulse Buying.

Research Model

This research model describes the relationship between the independent variables (Flash Sales and Live Streaming), the mediating variable (E-WOM), and the dependent variable (Impulse Buying). This model can be illustrated as follows:

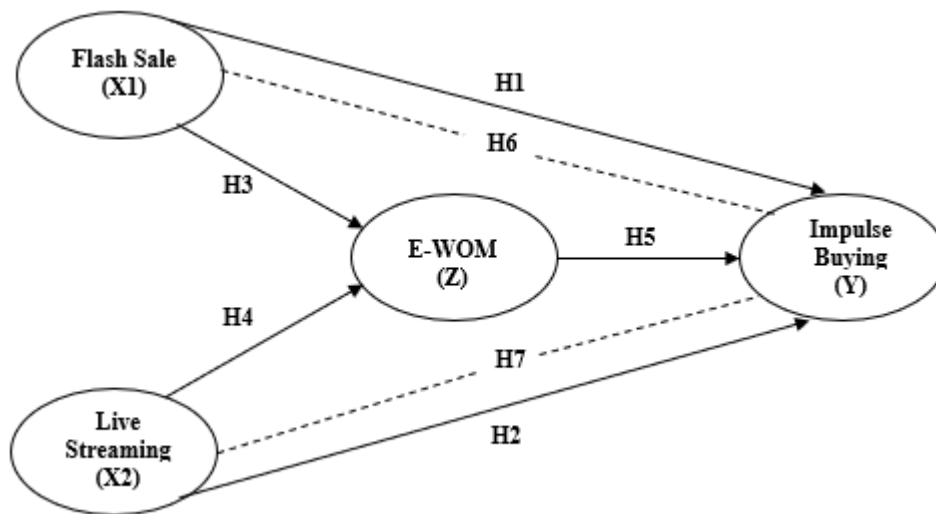


Figure 2
Research Model / Hypothesis Framework
Source: Processed by researcher (2025)

This research model depicts that Flash Sales and Live Streaming have both direct and indirect effects on Impulse Buying through Electronic Word of Mouth (E-WOM) as a mediating variable. The relationships between the variables in this model will be tested to determine the direction and strength of their influence.

RESULTS AND DISCUSSION

Results of Respondent Characteristics

This study involved 120 respondents, Generation Z Shopee users in Surabaya. The sample size was determined based on Hair et al. (2019), who recommend a minimum sample size five times the number of indicators. Therefore, 120 respondents were deemed sufficient for the 12 indicators in this study.

Respondent characteristics were classified by age, gender, and region of residence. Based on age, 6 respondents (5.0%) were aged 13–17, 75 respondents (62.5%) were aged

18–22, and 39 respondents (32.5%) were aged 23–28. Based on gender, there were 107 female respondents (89.2%) and 13 male respondents (10.8%).

Based on the respondents domicile, 42 respondents (35.0%) were from West Surabaya, 32 respondents (26.7%) from Central Surabaya, 21 respondents (17.5%) from East Surabaya, 20 respondents (16.7%) from South Surabaya, and 5 respondents (4.2%) from North Surabaya. Thus, it can be concluded that the majority of respondents are women aged 18–22 years who live in the West Surabaya area, which reflects the main characteristics of Generation Z active Shopee users in Surabaya.

Convergent Validity Results

Convergent validity testing was conducted to assess the extent to which each indicator explains the construct being measured. Based on the outer loading results, all indicators had values above 0.70, with a range between 0.709 and 0.914. These values meet the minimum criteria according to Hair et al. (2019), which states that an indicator is considered valid if its loading factor is greater than 0.70.

These results indicate that all questionnaire items in the study have a good level of validity in measuring their respective constructs. Therefore, all indicators are deemed to meet the convergent validity criteria based on their outer loading values.

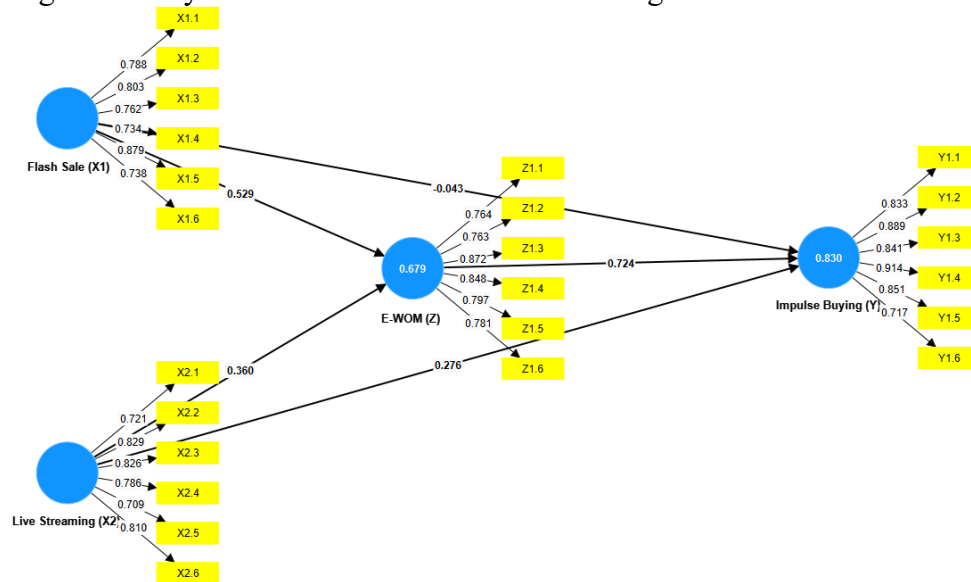


Figure 3.
PLS Algorithm Test Measurement Model
 Source: SmartPLS 4.0 output, processed data (2025)

Results of Discriminant Validity

Discriminant validity testing was conducted to ensure that each construct in the model was truly distinct from the others. Data processing results showed that the outer loading value for each indicator was higher than the value for other constructs, thus preventing any overlap between variables. Furthermore, the Average Variance Extracted (AVE) value for each construct also met the criteria, namely 0.617 for Flash Sale, 0.611 for Live Streaming, 0.648 for E-WOM, and 0.711 for Impulse Buying. All AVE values above 0.50 indicate that the constructs in the model have good discrimination and meet the criteria of Hair et al. (2019).

Table 1.
Average Variance Extracted (AVE) Value

Construct	AVE
Flash Sale	0.617
Live Streaming	0.611
E-WOM	0.648
Impulse Buying	0.711

Source: SmartPLS 4.0 output, processed data (2025)

Results of Composite Reliability

The composite reliability test results show that all constructs have composite reliability values above the minimum limit of 0.70, indicating good reliability. The composite reliability values for each variable are 0.906 for Flash Sale, 0.904 for Live Streaming, 0.917 for E-WOM, and 0.936 for Impulse Buying. Since all values are above 0.70, the constructs are declared to have excellent internal consistency. These results strengthen the conclusion that each indicator is able to explain the latent variables reliably and consistently.

Table 2.
Composite Reliability Values

Construct	Composite Reliability
Flash Sale	0.906
Live Streaming	0.904
E-WOM	0.917
Impulse Buying	0.936

Source: SmartPLS 4.0 output, processed data (2025)

Results of Cronbach's Alpha

The Cronbach's Alpha values for all constructs also showed high reliability, with results of 0.875 for Flash Sale, 0.872 for Live Streaming, 0.891 for E-WOM, and 0.917 for Impulse Buying. Based on Hair et al.'s (2019) standards, a good Cronbach's Alpha value is above 0.70, so all constructs can be considered reliable. This means that each item in the research variable has a good level of consistency in measuring the same concept. Thus, the instrument used in this study has met the criteria for internal reliability.

Table 3.
Cronbach's Alpha Value

Construct	Cronbach's Alpha
Flash Sale	0.875
Live Streaming	0.872
E-WOM	0.891
Impulse Buying	0.917

Source: SmartPLS 4.0 output, processed data (2025)

R-Square Results

The R-Square value is used to measure how much the independent variable is able to explain the dependent variable. The results show that the R-Square value for the E-WOM variable is 0.679, which means that the Flash Sale and Live Streaming variables are able to explain 67.9% of the variance in E-WOM, while the remaining 32.1% is explained by other variables outside the model. This value is included in the strong category because it is above 0.67. Meanwhile, the R-Square value for the Impulse Buying variable is 0.830, indicating that the Flash Sale, Live Streaming, and E-WOM variables together are able to explain 83.0% of the variance in Impulse Buying. This value is included in the very strong category, which means the research model has high explanatory power for the dependent variable.

Table 4.
R-Square Value

Variable	R-Square	Category
E-WOM	0.679	Strong
Impulse Buying	0.830	Very strong

Source: SmartPLS 4.0 output, processed data (2025)

Causality Test Results

The relationship between variables was tested using bootstrapping analysis in SmartPLS 4.0 to determine the direction and significance of the influence between constructs. The test results showed that Flash Sale had no significant effect on impulse buying, with a coefficient value of -0.043, a t-statistic of 0.492, and a p-value of 0.623, all greater than 0.05. These results indicate that Flash Sale's direct influence on impulse buying is insignificant, thus rejecting the first hypothesis (H1). However, Flash Sale still has the potential to influence impulse buying through the mediating variable E-WOM.

Furthermore, the relationship between Live Streaming and Impulse Buying showed a coefficient value of 0.276, a t-statistic of 3.230, and a p-value of 0.001, all less than 0.05. These results indicate that Live Streaming has a positive and significant effect on impulse buying, thus accepting the second hypothesis (H2). This indicates that the live streaming feature on e-commerce platforms can encourage impulse purchases through emotional interaction and persuasion.

The relationship between Flash Sales and E-WOM has a coefficient value of 0.529, a t-statistic of 5.098, and a p-value of $0.000 < 0.05$. These results indicate that Flash Sales have a positive and significant effect on E-WOM, thus accepting the third hypothesis (H3). This indicates that limited-time promotions with significant discounts can encourage users to share their experiences through online reviews or recommendations.

Furthermore, the relationship between Live Streaming and E-WOM also shows a significant result with a coefficient value of 0.360, a t-statistic of 3.393, and a p-value of $0.001 < 0.05$. These results support the acceptance of the fourth hypothesis (H4), which means that Live Streaming activities can increase interaction and communication between users in the form of Electronic Word of Mouth.

Testing the effect of e-WOM on impulse buying yielded a coefficient of 0.724, a t-statistic of 8.840, and a p-value of $0.000 < 0.05$. These values indicate a strong, positive, and significant effect, thus accepting the fifth hypothesis (H5). This means that the more positive

reviews and recommendations spread on social media, the more likely consumers are to make impulse purchases.

Furthermore, the indirect effect of Flash Sales on impulse buying through e-WOM showed a significant result (based on the indirect effect of SmartPLS 4.0), thus accepting the sixth hypothesis (H6). This means that Flash Sales do not directly increase impulse buying, but their effect occurs through increased e-WOM activity. In other words, e-WOM acts as a mediator in the relationship between Flash Sales and impulse buying.

Finally, the test results for the indirect effect of Live Streaming on impulse buying through e-WOM also showed a p-value below 0.05. These results support the acceptance of the seventh hypothesis (H7). These findings suggest that live streaming can drive impulse buying both directly and indirectly through electronic word of mouth.

Overall, the results of the structural model test indicate that e-WOM has the most dominant influence on impulse buying, while flash sales have an indirect influence through e-WOM, and live streaming has both direct and indirect influences on impulse buying behavior. These findings confirm that digital social interactions and interactive experiences are important factors in triggering impulsive behavior among Generation Z consumers on the Shopee platform.

Table 5.
Results of the Inter-Variable Relationship Test

No	Hypothesis	Relationship between variables	Coefficient	t-statistic	p-value	Information
1	H1	Flash Sale → Impulse Buying	-0.043	0.492	0.623	Not significant (rejected)
2	H2	Live Streaming → Impulse Buying	0.276	3.230	0.001	Significant (accepted)
3	H3	Flash Sale → E-WOM	0.529	5.098	0.000	Significant (accepted)
4	H4	Live Streaming → E-WOM	0.360	3.393	0.001	Significant (accepted)
5	H5	E-WOM → Impulse Buying	0.724	8.840	0.000	Significant (accepted)
6	H6	Flash Sale → E-WOM → Impulse Buying (Indirect)	0.383	4.446	0.000	Significant (accepted)
7	H7	Live Streaming → E-WOM → Impulse Buying (Indirect)	0.261	3.121	0.002	Significant (accepted)

Source: SmartPLS 4.0 output, processed data (2025)

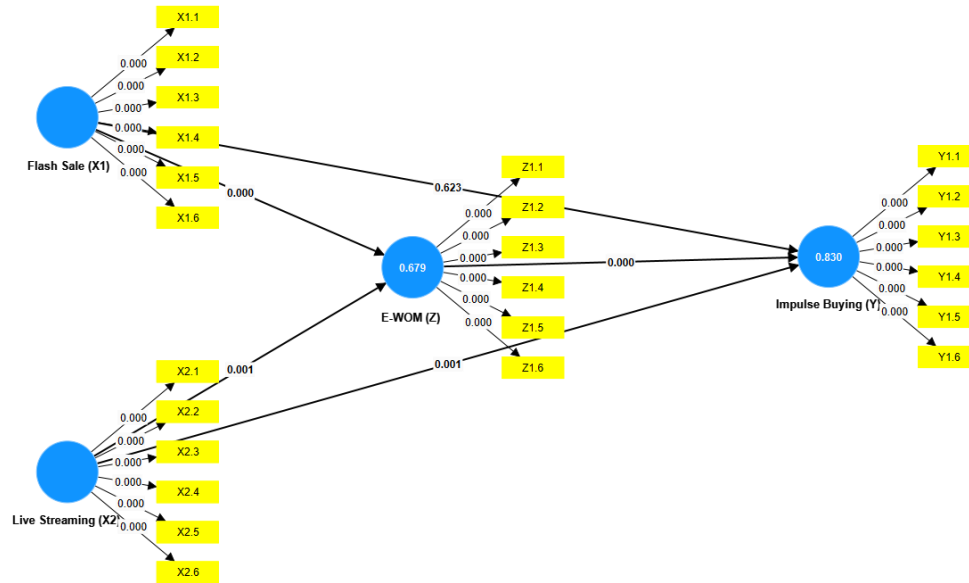


Figure 4.
Bootstrapping Test Measurement Model
 Source: SmartPLS 4.0 output, processed data (2025)

Discussion

The results of this study indicate that not all hypotheses in the model are directly accepted, although they generally support the Stimulus–Organism–Response (SOR) theory. This theory explains that digital promotions (stimulus) can influence the psychological and social reactions of consumers (organisms), ultimately resulting in certain behaviors (responses). In the context of this study, Flash Sales and Live Streaming act as stimuli, E-WOM as consumers' social reactions, and Impulse Buying as a response in the form of spontaneous purchases.

The relationship between Flash Sales and Impulse Buying (H1) was not significant, with a p-value of 0.623 (>0.05). This means that flash sales promotions on Shopee do not directly induce Generation Z consumers in Surabaya to make impulsive purchases. This result differs from the research by Fitriana and Istiyanto (2024), which found a positive effect of flash sales on impulsive purchases. However, this study aligns with the findings of Mutaqin (2024), who explained that the influence of flash sales will diminish if not accompanied by social interactions such as reviews or recommendations from other users. Rahmah and Salsabila (2023) also stated that excessively frequent promotions can make consumers feel less compelled to buy. This suggests that flash sales are attractive, but not enough to generate emotional impulses without the support of social factors like e-WOM.

Unlike flash sales, live streaming has a positive and significant effect on impulse buying (H2) with a p-value of 0.001 (<0.05). These results support research by Nurhaliza and Kusumawardhani (2023), which states that direct interaction through live streaming can increase consumer trust and positive emotions, thus encouraging spontaneous purchases. Xu et al. (2020) also explain that live streaming can create a sense of "social presence" between sellers and buyers, which makes consumers feel more confident and interested. According to SOR theory, live streaming is a powerful stimulus because it evokes psychological reactions

such as trust, emotional involvement, and a desire to own the product, which ultimately encourages impulsive buying.

The relationship between Flash Sales and E-WOM (H3) was positive and significant ($p = 0.000 < 0.05$). These results indicate that limited-time promotions can encourage consumers to share their positive experiences online. This finding aligns with research by Mutaqin (2024), who stated that flash sales can generate conversations among users and create a "buzz marketing" effect. When consumers are satisfied with obtaining a product at a low price, they tend to share it with others through reviews or social media. This confirms that flash sales are more effective in fostering digital communication than directly encouraging impulse purchases.

Furthermore, Live Streaming has a positive and significant effect on E-WOM (H4) with a p-value of 0.001 (< 0.05). This finding aligns with Nurhaliza and Kusumawardhani (2023) and Xu et al. (2020), who found that live streaming can increase consumer engagement and trust in sellers, thus encouraging them to share experiences or recommendations online. In the context of SOR theory, live streaming serves as a visual and interactive stimulus capable of eliciting social reactions (organisms) in the form of communication activities between users.

The study also showed that e-WOM has a positive and significant effect on impulse buying (H5) with a p-value of 0.000 (< 0.05). This means that communication between consumers in the digital world plays a significant role in driving impulse buying. This finding supports research by Purbasari and Respati (2024), which showed that online reviews and recommendations can increase trust and strengthen purchasing decisions. Uberall's (2024) report also states that most consumers read online reviews before purchasing a product, demonstrating the powerful influence of e-WOM on the decision-making process. In SOR theory, e-WOM is part of the organism that channels the influence of promotional stimuli into social and emotional drives that ultimately lead to impulsive behavior.

Furthermore, the research results show that e-WOM mediates the effect of Flash Sales on Impulse Buying (H6). This means that Flash Sales do not directly induce consumers to make impulsive purchases, but rather, their effect emerges through e-WOM activities. These results align with research by Mutaqin (2024), who stated that digital promotions are more effective if they foster social interaction between users. In other words, when Flash Sales trigger online reviews and conversations, the impulse to make impulsive purchases emerges.

Furthermore, e-WOM also significantly mediates the effect of Live Streaming on Impulse Buying (H7). This supports research by Nurhaliza and Kusumawardhani (2023), who found that positive experiences during live streaming encourage consumers to share their experiences and recommendations with others. Consequently, the impact of Live Streaming on impulsive buying is strengthened, both directly and indirectly through social communication.

Overall, the results of this study strengthen the SOR theory in the context of digital shopping behavior. Flash sales and live streaming act as stimuli that evoke social and emotional reactions through e-WOM (organisms), which then result in impulse purchases. This also suggests that Generation Z tends to be more responsive to interactive and social promotions than to conventional advertising. In other words, their purchasing decisions are heavily influenced by interactions and experiences in the digital environment.

CONCLUSION

This study aims to analyze the influence of Flash Sales and Live Streaming on Impulse Buying, with E-WOM as a mediating variable among Generation Z Shopee users in Surabaya. Based on the analysis using SmartPLS 4.0, all variables in this study were proven valid and reliable. The R-Square values of 0.679 for E-WOM and 0.830 for Impulse Buying indicate that this model has strong ability to explain the relationship between the variables.

The results show that Live Streaming has a significant effect on Impulse Buying, while Flash Sales have no direct effect. However, both have a positive effect on E-WOM, and E-WOM plays the most dominant role in influencing impulse buying and serves as a mediating variable for both stimuli. These findings align with the Stimulus–Organism–Response (SOR) theory, where Flash Sales and Live Streaming act as stimuli, E-WOM as a social and psychological reaction, and Impulse Buying as the consumer's final response.

From a theoretical perspective, this study expands the application of SOR theory to Indonesian digital consumer behavior, particularly among Generation Z, who are more responsive to social interactions and visual content. Practically, the research findings provide input for Shopee and other e-commerce players to focus more on interactive marketing strategies, such as live streaming and effective e-WOM management, to positively increase impulse buying.

While this study provides a comprehensive overview, its limited scope to Shopee users in Surabaya and the use of an online survey are limitations. Future research is recommended to expand the research area and include other variables such as brand trust, shopping enjoyment, or social influence for more comprehensive results.

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