Gain-Loss Framing: Comparing the Push Notification Message to Increase Purchase Intention in e-Marketplace Mobile Application

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ABSTRACT Cart abandonment is a phenomenon that occurs when a customer begins an online transaction but does not complete the sale until the payment process of an e-marketplace app. It has become an issue for e-marketplace sellers and developers because it can reduce sales and delay income. One way to reduce cart-abandonment rates is to send push notifications as a reminder to persuade customers to complete their transaction. A stimulus-organism-response (SOR) framework is used as the conceptual foundation. The stimulus is the push notification, then the organism perceives the value of the product, and purchase intention is the response. The push notification is designed to use message framing, which can be gain-framed or loss-framed. The personalization effect is also analyzed, because it has been shown to persuade users with marketing and promotional products effectively. This study also compares two product types: utilitarian and hedonic. The study was conducted with a 2 (gain-framed and loss-framed) × 2 (hedonic and utilitarian) × 2 (personalized and general) between-subjects experiment. Hypotheses were tested by comparing the perceived value for each group using analysis of variance and a mediation analysis of 600 datasets. The result shows a general message with gain-framed and the loss-framed message is not significantly different from the perceived value of the product, regardless the product type. A personalized message with gain-framed content has a better effect than loss-framed content as it relates to the perceived value of a utilitarian product, but the improvement is not significant for a hedonic product. Perceived value of the product also has a significant effect on purchase intention and partially mediated the effect of message-framing toward product purchase intention. Thus, it is better to design the push notification as a personalized message with gain-framed message content in order to reduce cart-abandonment rates.

INDEX TERMS Message framing, message personalization, product type, purchase intention, perceived value, push notification.

I. INTRODUCTION

The development of information technology has produced innovations that help everyday human activities, especially as they relate to business. Business transactions that were originally carried out offline can now be conducted online with the Internet. The presence of this information technological innovation helps provide opportunities to develop and reach a potential that is ten-to-twenty-times higher, compared to the traditional manner of shopping [1]. Business opportunities in electronic commerce (e-commerce) have also increased significantly and are relevant to existing companies and startups wishing to build and grow their e-commerce businesses. To date, there have been many popular e-commerce marketplace applications (apps) in Indonesia. According to infographic reports issued by iPrice, some of the most widely used e-marketplace apps in Indonesia include Lazada, Tokopedia, Bukalapak, Bibili, and Shopee [2].

The high number of buyers makes Indonesia a country with the highest number of online shopping transactions, compared to other countries in Southeast Asia [3]. Every year, the amount of revenue generated by e-trading
companies increases two-to-three-fold over the previous year [4]. This means that e-commerce in Indonesia has great potential to further develop in the future. In addition to providing opportunities, information technology also presents its own challenges to business owners. The growing number of e-marketplaces actually makes business competition tougher, which then causes the e-marketplace to try to help sellers reach more customers from various regions without a guarantee that the seller will get customers more easily [5].

The number of visitors of an e-marketplace app does not guarantee that a business will earn profits, because value will only be created if each visitor completes a transaction successfully. Potential actual purchases begin when a user searches for products, places those products on their Wishlist or Favorites list, places those products in their shopping cart, goes through the checkout process, but does not make a payment. The number of potential purchases is directly proportional to the increased potential for failed transactions that occur in e-marketplace apps. On average, the number of failed transactions is four times greater than the number of successful transactions [6].

One of the most common issues faced by e-marketplace businesses is cart abandonment, which occurs when a user leaves their shopping cart full of products without completing the transaction through to payment [7]. Users can cancel transactions at different stages of purchasing, such as after searching for a product, before including a product in a Wishlist or Favorites list, and during the check out or payment stage. This phenomenon leads to a greater number of failed transactions than successful transactions. The large number of transactions that fail cause a significant loss to the e-marketplace company because of the effort and costs incurred by an e-marketplace company to provide services [6]. To cover these losses, e-marketplace companies are therefore looking for ways to increase the number of successful transactions.

Many e-marketplace companies offer new technological innovations in their apps to reduce such losses [7]. One of these innovations is the reminder feature in the form of a push notification. Based on the stimulus-organism-response (SOR) theory, the reminder feature can actually be used as a stimulus to encourage users as organisms to make a response, which is to continue the delayed transaction until the payment stage is completed. The SOR theory is used in this study because it has been the most popular theory for research related to online shopping behavior over the last ten years [8]. The SOR theory is also suitable because this research focuses on an analysis of the influence of push notification on a person’s purchase intentions.

Thus far, the implementation of a push notification has not overcome the phenomenon of cart abandonment effectively. The user of a mobile device often has too many notifications stacked up and eventually removes them without performing any action [9]. Previous studies of human behavior have been conducted to determine when the notification should be delivered to provide the least amount of annoyance and the greatest utility [9]. However, the content of the notification should also be studied to attract the reader and stimulate them to open the message and further act upon it.

Message framing, which is one method of delivering information, can appropriately convince users to make product purchases [10]. Message framing explains how information can cause recipients to make different decisions if the message is conveyed by highlighting different valences [11], [12]. This is reinforced by the presence of prospect theory which serves to explain how message framing can influence preferences and outputs [12]. Message framing is classified into two types: gain-framing and loss-framing. Gain-framing is a message that leads to the reader gaining an advantage when doing what is asked of them, while loss-framing is a message that causes the reader to suffer losses if they do not do what is asked of them [13].

The most popular topic in message-framing research is health. Several studies have found that message framing on conventional and e-cigarette warning labels affects a person’s attitude and intentions to not want to try smoking, or to stop smoking [14]–[16]. Message framing was also found to influence consumption decisions and prevent obesity [17]. In addition to health topics, several studies utilized message framing for marketing and advertising purposes. Message framing was found to affect someone who had never used a credit card for shopping to use the card again [18], and this technique can affect a person’s attitude toward a product [19]. Furthermore, Lee et al. [13] found that message framing in product advertisements affected a consumer’s intention to purchase a product.

From the existing literature, few studies have raised the topic of message framing in e-commerce, especially as it relates to push notifications on e-commerce apps. Even though push notifications can be used to persuade consumers to want to perform a transaction in the e-marketplace, such as displaying advertisements to consumers, this approach must be different from advertising, because a push notification only allows a limited number of characters. Thus, the role of message framing is necessary so that the push notification sent is on-target.

In addition to message framing, there are other methods that are frequently used in customer relationship management disciplines to retain customers or to reduce churn rates, namely personalization. Personalization of messages in advertisements has been found to be related to a person’s intention to make a purchase [20]–[22]. From these studies, few have raised the topic of the relationship between message personalization in push notifications and the someone’s intention to make a purchase.

Comparing studies on message framing for marketing and advertising products conducted by Lee et al. [13], Ganzach and Kasrai [18], and Buda and Zhang [19], and did not achieve the same results, even though both were found to influence someone’s purchase intentions. The same observation was identified in research conducted on message personalization. Research conducted by Dawson and Kim [20],
Tran [21], and Setyani et al. [22] also did not achieve these results. The unequal results obtained were caused by other factors that can also influence the decisions a person makes after receiving a message. The types of products being marketed actually play an important role in shaping one’s preferences for making purchases [23]–[25]. These studies divided products into two types: hedonic and utilitarian products. According to Lu et al. [25], hedonic products provide luxury and pleasure, while utilitarian products can meet the user’s needs and are practical.

In this study, therefore, an experiment was conducted using message framing, which was divided into gain-framed and loss-framed, on push notifications that function as persuasion to users who abandon their shopping cart. In addition to message framing, this research conducted push notification comparison experiments that contain personalized content and those that do not, because online trade business owners often use them for marketing and product promotion [20]. Personalization is a concept that connects products, processes, and practices to human individuals [26]. This research aims to show whether personalized messages are more effective and have a stronger persuasive effect than non-personalized messages. Experiments carried out focus on the type of product in the transaction—hedonic or utilitarian products—because the type of product can influence a consumer’s preferences when making purchasing decisions. Furthermore, the impact of message framing, product type, and message personalization was evaluated as it relates to perceived value and intention to purchase the product.

The results of this study are expected to contribute to the world of e-commerce. E-trading companies, especially e-marketplaces, will be able to use the study results as a basis for consideration when it comes to decision-making and implementing research results. In addition, the results of this research are expected to help e-trading companies strengthen their position in and amongst increasingly fierce market competition in the future.

II. LITERATURE REVIEW
A. CART ABANDONMENT

With the presence of the Internet and technology, websites and e-commerce apps can be easily accessed anywhere and at any time. Thus, an app can attract many visitors, even though the number of visitors does not guarantee that many transactions will be completed successfully. According to Cho [6], 95% of internet users who visit e-commerce websites do not actually have the intention to conduct a transaction. Of the remaining 5% who have the intention to carry out a transaction, not all actually complete their transaction, and many tend to leave the product or products on their purchase list without proceeding to payment. Only one in four transactions is actually completed with successful payment.

One phenomenon of an incomplete transaction is called cart abandonment, in which a product that has been placed in a shopping cart is abandoned and is never paid [7], [27]. Cart abandonment occurs when a user has checked out their shopping cart but does not finish the transaction with payment [6]. The high level of cart abandonment on e-commerce websites or applications causes the company to pay higher costs, especially if many of the customers are not loyal [27]. According to research by the Baymard Institute, 68.81% of shopping carts abandoned by customers lead to losses that are three-times-greater than the generated profits [28]. E-trading companies suffer losses because they incur costs to provide services to customers, but they do not get payment in return due to incomplete transactions.

B. PUSH NOTIFICATION ON MOBILE APPLICATION

In mobile applications, a push notification is technology that is often implemented and a strategy for dealing directly with users [29]. With push notifications, users can receive a short message that directly appears on their smartphone screen on a programmed schedule. When it is tapped, the user can be immediately directed to the associated mobile app. Research found that push notifications can increase the number of active users or at least those users who access the mobile app [29]. Push notifications can cause 65% of users to actively use the application again, and the notifications can lead 48% of users to conduct transactions on the app [30]. E-trading companies often benefit from the advantages of push notifications when they are used to conduct marketing and promotions [31]. In addition to marketing and promotions, push notification can also be utilized to cause users who leave the app to return and access the app and continue the transaction that they left behind. Therefore, push notifications are expected to be a solution for the cart-abandonment issue.

However, in addition to the benefit of increasing user access to the app, a drawback is that these notifications can cause an interruption overload, which is a situation where the attention and performance of users become disrupted due to too many interruptions [32]. It is not surprising to see the number of push notifications that can be received by users every day [33]. For this reason, it is necessary to design push notifications so the purpose is effectively achieved without disturbing the user. The settings may include the most convenient time and appropriate content settings to attract users’ attention, so they will want to access the mobile app again. To manage content, it is necessary to plan accordingly prior to sending the push notifications.

C. MESSAGE FRAMING

Message is an important element in the communication process. The message must be arranged in such a way that it is both interesting and understood by the recipient; this can be accomplished by implementing message framing, which explains how information can cause recipients to make different decisions when a message is conveyed by highlighting different valences [11]. The concept of message framing was derived from the prospect theory developed by Kahneman and Tversky in 1979, and this concept illustrates the ways in which the power of persuasion in a message can be perceived.
different, even when the content is the same, depending on how the content is arranged [34].

Message framing is divided into three types [11]. The first type is risky-choice message framing, which is a message arranged according to a collection of choices with different levels of risk; this type can affect the reader’s risk preferences. The second type is the message framing attribute, where messages are arranged according to the characteristics of the object or product. This type can affect the reader’s evaluation of the object or product. The third type is based on goal message framing, where messages are arranged according to the consequences or purpose of an action; this final type can provide persuasion to the reader. Because this research was conducted to observe the influence of message framing as persuasion to users who abandon their transactions, this research will focus on goal message framing. Since the concept of message framing started to be developed, many studies have utilized it to examine the process of human judgment and decision-making. This means that message framing is very popular and used for research on persuasive communication. Furthermore, goal message framing is widely used for research related to health, medical, and customer decisions, responses to social dilemmas, audit evaluations, and other decisions [11].

Goal message framing can be divided into two “sides”. The message can place greater emphasis on the positive consequences of doing something or on the negative consequences of not doing something. Messages that emphasize the positive side are also called gain-framed and focus the attention to achieve positive consequences or benefits. While messages that emphasize the negative side, or loss-framed, focus the attention to avoid negative consequences. Positive and negative consequences can be adjusted to the topic being framed, so the context can vary. The effectiveness of goal message framing is measured by the probability of adopting a behavior delivered in the message. Although both can have an impact on consumer behavior, the impact between gain-framed and loss-framed can differ depending on the characteristics of the person [35]. How to deliver information with the right message framing can convince users to take certain actions. Research proves that message framing can convince users to make product purchases [10], [13], [18], [19].

Although many studies have succeeded in determining the effect of message framing as it relates to convincing users to take certain actions, the results regarding the type of message framing that exerts this effect are inconsistent. Gain-framed messages are more effective in health-related messages to prevent skin cancer and smoking [36]. A study also found that message framing types will have different effects under different conditions, but in general, gain-framed messages are more effective for persuasion [13]. Another study, however, found that the loss-framed type of message is more effective in convincing users to take certain actions [17], [18]. On the other hand, Yang [37] found that the gain-framed message type and the loss-framed message type were effective in different situations; thus, there is no conclusion as to which type is more effective.

D. PRODUCT TYPE

Many studies have found that differences in a person’s attitude and their preference for making a purchase are influenced by the type of the product itself [13], [23]–[25]. These studies divide products into two types: hedonic and utilitarian products. Hedonic products are aimed at fulfilling desires and enjoying a pleasant experience; hedonic products generally provide luxury and pleasure, and this type of product is also related to the imagination, entertainment, and self-expression, and they can provide guilt when consumed [38]. Utilitarian products meet the user’s needs and are practical, and they generally function to meet a person’s basic needs and to assist with functional work; when consumed, utilitarian products usually do not provide feelings of either pleasure or guilt [38]. These two types of products are not mutually exclusive, meaning that just because something is not considered to be a hedonic product does not mean it is a utilitarian product, and vice versa. All products have both hedonic and utilitarian elements, but the levels thereof vary [25]. Hedonic products will have higher hedonic attributes, while utilitarian products will have higher utilitarian attributes.

E. PERSONALIZATION

The average user of an e-commerce website only takes thirty seconds to decide whether they want to look at products on the website or leave [20]. One way to attract the attention of website visitors is to implement a personalization strategy. Personalization is a concept that connects products, processes, and practices to individuals [26]. In personalized communication, the sender of the message will treat the recipient of the message as a unique individual and design the contents of the message to match the characteristics and preferences of the message recipient [39]. In personalization, there are no specific or basic provisions that must be followed by the sender to design the contents for the message. According to Li [39], Hirsh et al. [40], and Dijkstra [41], personalization must come from an individual’s personal characteristics, such as their name and personal traits. Meanwhile, according to Abrahamse et al. [42] and Beam [43], personalization must originate from the interests, preferences, and behaviors that have been carried out. [44] in their research combined personal characteristics and individual preferences to design personalized messages. Even though the basis and conditions for designing personalized messages that were carried out in previous studies differ, all of them found that personalization of messages can make persuasion more effective. [39] in his research found that personalized messages are more effective than messages that are not personalized for persuasion. Because of the power to persuade, online business owners often use personalization for product marketing and promotion [20]. Personalized product advertisements lead customers to have the intention to purchase higher-quality products [20]–[22], [45]. In addition to previous research
TABLE 1. Previous studies.

| Author               | Theory                                      | Independent Variables                                                                 | Dependent Variable                                                                 | Methods                                      | Respondents                        | Results                                                                 |
|----------------------|---------------------------------------------|----------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|---------------------------------------------|------------------------------------|------------------------------------------------------------------------|
| Lee dan Liu (2018)   | Regulator y focus/fit theory                | Message framing (positive and negative), product type (hedonic and utilitarian), regulatory focus (promotion focus and prevention focus) | Attitude toward advertising, intention of product purchase                           | Experimental research using data ANOVA analysis methods | 250 undergraduates and master’s students | Positive messages that are effective for a customer promotion focus with hedonic and utilitarian product types, and effective for a customer prevention focus with utilitarian product types |
| Yang dan Hsu (2015)  | Prospect theory                            | Message framing (positive and negative), product type (symbolic and utilitarian)       | Ad preference                                                                        | Experimental research using two-way ANOVA data analysis methods | 240 undergraduates and master’s students | Positive messages produce higher message preferences for utilitarian product types, while negative messages produce higher message preferences for symbolic products |
| Buda dan Zhang (2000) | Prospect theory, Cognitive response theory | Message framing (positive and negative), order of presentation, source credibility     | Attitudes toward products                                                            | Experimental research using data ANOVA analysis methods | 200 undergraduates                  | Positive messages produce a higher attitude toward the product than negative messages |
| Ganzach dan Karashi (1995) | Prospect theory                           | Message framing (gain-framed and loss-framed), payment methods (cash and check)       | Shopping behavior (credit card usage and total costs incurred)                       | Experimental research using data ANOVA analysis methods | 246 credit-card owners            | Loss-framed messages make more customers reuse their credit cards, compared to gain-framed messages |

findings as to the effectiveness of personalization, there has been no research to investigate whether this effectiveness also applies to push notifications on e-commerce apps.

F. PERCEIVED VALUE OF THE PRODUCT AND PURCHASE INTENTION

The concept of perceived value, which refers to the overall consumer assessment of products based on their perceptions of what is received and what is obtained, was first developed by Zeithaml [46]. In research on consumer behavior, perceived value is used to explain the decisions taken by consumers [47], and this concept is found to be the first determinant of a transaction decision [48]. Perceived value plays an important role for both consumers and business owners; for consumers, acquiring product value is the main goal in the transaction [47], [49]; whereas for business owners, the perceived value possessed by consumers is a competitive advantage and can be used to predict behavior in transactions [50].

The perceived value of an e-commerce product consists of two dimensions [51]: the function and the price of the product itself. The functional value of a product is the main driver for someone to decide to make a purchase. On the other hand, when the price of the product is low and the function of the product is unknown, consumers will be interested in trying the product.

Purchase intention is a decision made before someone completes a purchase of a product [52]. This study aims to contribute solutions to the phenomenon of cart abandonment in e-marketplace apps, so the intention to purchase products is an important response in this study. The business-owners themselves have a focus on increasing consumers’ willingness to buy products [53], which are described in this study as the purchase intention.

G. STIMULUS-ORGANISM-RESPONSE (SOR) THEORY

In 1974, Mehrabian and Russell developed the SOR theory in the field of environmental psychology. Until now, there has been a lot of research on purchasing behavior using this theory [54]. The SOR theory explains how triggers from the environment influence one’s affect and cognition, which causes a person to perform certain behaviors [55]. Based on its name, the SOR theory consists of three components: stimulus, organism, and response. “Stimulus” is a trigger that affects individuals, which in this study are messages on push notifications sent to users. “Organism” refers to the affective and cognitive conditions of the user after interacting with the stimulus, which in this study represents perceived value. Finally, the “response” is the user’s reaction to the stimulus and organism, which in this study is the intention to purchase the product. Many researchers have begun to use environmental psychology theory to examine online shopping behavior; the SOR theory has been the most popular theory for research of online shopping behavior over the last ten years [8].

H. RESEARCH GAP

Message framing was used in earlier research on marketing and product advertising; all studies that were previously
referred to utilized experimental methods. The independent variables that were studied in each can be divided into at least two types, so the need to compare these different treatments can be met with experimental methods. A suitable data analysis method that can be used to compare the conditions of several different treatments is the analysis of variance (ANOVA). Not many of these previous studies specifically examined the impact of message framing to overcome the phenomenon of cart abandonment in e-marketplace apps. Product advertisements studied in these studies used print media, while none specifically used push-notification media. However, previous studies found that message framing can influence attitudes, purchase intentions, preferences, and shopping behavior.

This research will include experiments that were conducted using message framing—which is divided into gain-framed and loss-framed—on push notifications that function to persuade users who abandon their transactions. Reflecting from the previous research, message framing cannot stand alone, because there are other factors that can influence a person’s attitude and behavior. Therefore, the conducted experiments will also pay attention to the types of products in the transaction—hedonic or utilitarian products—because the product type can influence someone’s preferences, as well as their purchasing decisions.

In addition to message framing and product types, this study will also evaluate variables that were never analyzed in the previous research, namely message personalization. Experiments will be conducted to compare push notifications that contain personalized content with those that do not. Furthermore, the impact of message framing, product type, and message personalization will also be evaluated on a dependent variable that has never been raised before—perceived value—and variables that are closely related to the shopping process, such as the intention to purchase the product.

III. HYPOTHESIS DEVELOPMENT

The model proposed for this research can be seen in Figure 1. This research model is designed based on the SOR theory and refers to the research of Wells et al. [56]. The stimulus is represented by a push notification sent to the user. In the proposed research model, the stimulus is represented by components in the push notification, such as the message framing, product type, and message personalization. The organism in this research model is represented by the perceived value. The response in this research model is represented by the purchase intention of the product.

A. MESSAGE FRAMING AND PERCEIVED VALUE OF PRODUCT

Message framing explains how information can cause recipients to make different decisions if the message is conveyed by highlighting different valences [11]. Gain-framed messages focus on achieving positive consequences or gains, while loss-framed messages focus on avoiding negative consequences. The effectiveness of goal message framing is measured by the probability of adopting a behavior delivered in the message. In this study, the effectiveness of message framing is measured by using the variable of the perceived value of the product, because it is the first determinant of a person when making a decision to begin a transaction [48].

Previous research found different results regarding the effectiveness of gain-framed and loss-framed messages. Some studies also discovered that messages containing profit offers were more effective than messages that contained risks [13], [19]. The reason for this is because consumer behavior cannot be influenced when shopping online [57], [58]. In addition, based on the prospect theory, loss-framed-type messages will have a higher emotional impact than gain-framed-type messages [59]. The risk mentioned in a loss-framed-type message should not increase the perceived value of the product higher than the gain-framed-type message.

H1: Gain-framed messages have a significantly higher effect on the perceived value of product compared to loss-framed messages.

B. PRODUCT TYPE AND PERCEIVED VALUE OF THE PRODUCT

Hedonic products are aimed at fulfilling desires and enjoying pleasant experiences, while utilitarian products are practical and can meet basic personal needs [38]. Many people prioritize utilitarian products because those products are a necessity, thereby providing a strong reason for those transactions [60]. On the other hand, hedonic products are generally not in harmony with actual needs and have an element of luxury. Hedonic products are often considered to be an insignificant expense that leads to guilt and regret [38], [61], and buying these products can engender emotions that tend to be negative. In this study, therefore, it is predicted that the push notification will significantly increase the perceived value of the product if the product is utilitarian.

H2: Utilitarian-product-types have a significantly higher effect on the perceived value of product compared to hedonic-product-types.
C. PERSONALIZED MESSAGE AND PERCEIVED VALUE OF THE PRODUCT

The process for personalizing messages consists of two steps [62]. First, the sender assesses the characteristics and preferences of the recipient. Second, the sender uses the collected information to arrange the message. Furthermore, the recipient of the message must realize that the message matches him so that personalization works well, as successful message personalization will have a stronger persuasive effect [39]. Personalized messages will be processed better because they match the recipient’s personality [63]. An example of personalizing a message is to include the name of the recipient and the name of the product that the recipient has abandoned. In this study, therefore, it is predicted that personalized messages will significantly increase the perceived value of the product, compared to messages that are not personalized.

H3: Personalization of the message has a significantly greater effect on the perceived value of the product, compared to messages that are more general in nature.

D. RELATIONSHIP BETWEEN MESSAGE FRAMING INTERACTION AND MESSAGE PERSONALIZATION WITH PERCEIVED VALUE FOR PRODUCTS

Successfully personalized messages will have a stronger persuasive effect and will be better processed by the recipient [63]. In addition, messages containing profit offers are more effective than messages that contain risks [13], [19]. In this study, it is predicted that when a message is personalized, messages that offer benefits will more significantly increase the perceived value of the product than messages that contain losses. On the other hand, because a message that is not personalized is not properly processed by the recipient, the message framing of any type of public message will not significantly change the perceived value.

H4 (a): For personalized messages, gain-framed messages will have a significantly higher effect on the perceived value of product compared to loss-framed messages.

H4 (b): For general messages, gain-framed messages and loss-framed messages will not significantly influence the perceived value of the product.

E. RELATIONSHIP BETWEEN THE MESSAGE FRAMING INTERACTION AND PRODUCT TYPE AND THE PERCEIVED VALUE OF THE PRODUCT

Previous research on message framing related to product types did not yield consistent results. Hedonic products are related to desire and luxury, and can inflict feelings of guilt when consumed by individuals [38]. When hedonic products are described in messages that contain risks or losses, consumers will process the messages more seriously [64]. This is reinforced by research [37], which found that with a hedonic type of product, a loss-framed-type message will be more effective than a gain-framed-type message.

On the other hand, utilitarian products are necessity products, so that a gain-framed type of message will make it easier for consumers to identify that the product is very useful and has a higher value. This is evidenced by research from Lee et al. [13] and Yang [37], who found that messages that provide benefits therein will cause the preference for advertising to increase when the product is utilitarian. From previous literature, studies, and research, the hypotheses regarding message-framing interactions and product types are as follows.

H5 (a): For hedonic product types, loss-framed messages will have a significantly greater effect on the perceived value of the product, compared to the gain-framed message.

H5 (b): For utilitarian product types, gain-framed messages will have a significantly greater effect on the perceived value of the product, compared to loss-framed messages.

F. RELATIONSHIP BETWEEN MESSAGE-FRAMING INTERACTION, MESSAGE PERSONALIZATION, AND PRODUCT TYPE AND THE PERCEIVED VALUE OF THE PRODUCT

When someone receives a message, they check whether the message is compatible with their personal life [62]. If the message matches them, they will tend to process the message better. Based on this literature, it is predicted that the general message will not significantly affect the perceived value of the product. Therefore, when messages are not personalized, the perceived value for both hedonic and utilitarian product types, and gain-framed and loss-framed message types, will not differ significantly.

On the other hand, someone who receives a personalized message will process the contents thereof better, which means that a personalized message will significantly affect the perceived value of the product. For personalized messages, the authors propose hypotheses that are in line with the hypotheses regarding the interaction relationship between message framing and product type and the perceived value of the product. For hedonic products, it is predicted that a loss-framed message will significantly increase the perceived value of the product, compared to a gain-framed message. Conversely, for utilitarian products, it is predicted that the gain-framed message will significantly increase the perceived value of the product, compared to the loss-framed message.

H6 (a): For generalized messages and hedonic product types, gain-framed messages and loss-framed messages will not significantly influence the recipient’s perceived value.

H6 (b): For personalized messages and hedonic product types, loss-framed messages will have a significantly greater effect on the recipient’s perceived value, compared to gain-framed messages.

H6 (c): For generalized messages and utilitarian product types, gain-framed messages and loss-framed
messages will not have a significantly different effect on the perceived value of the product.

H6 (d): For personalized messages and utilitarian product types, gain-framed messages will have a significantly greater effect on the perceived value of product compared to loss-framed messages.

G. PERCEIVED VALUE OF THE PRODUCT AND PURCHASE INTENTION

Perceived value shares a close relationship with consumer demand [51]. Research in Taiwan found that a higher perceived value would cause intentions to buy high-quality products, as well [65]. In this study, it is also predicted that perceived value will positively correlate to product purchase intentions. In addition, it is also predicted that perceived value acts as a variable that mediates the relationship between message framing and product purchase intentions.

H7: Perceived value of the product has a positive influence on product purchase intentions and mediating the relationship between message framing and purchase intention.

IV. METHOD

A. SUBJECT AND RESEARCH ATTRIBUTES

The target respondents of this study are Indonesian citizens who have never shopped online. This study uses three independent variables: message framing, product type, and message personalization. There are also two dependent variables: the perceived value of the product and purchase intention. There are two indicators for each independent variable, and there are three indicators for the dependent variables. These indicators are in the form of a seven-point Likert scale.

B. DESIGN AND PROCEDURE

The experiments in this study used a factorial design \(2 \times 2 \times 2\) (message framing: gain-framed and loss-framed) \(\times\) (product type: hedonic and utilitarian) \(\times\) (personalization of messages: personalized messages and general messages). Thus, eight instruments type are generated (see Table 2). Every instrument consisted of narrative scenarios to be experienced by the respondents. The received scenario narrative is adjusted according to the type of product specified for the respondent, so all respondents who received an instrument with a hedonic product type (Instruments A, B, E, and F) are presented with the same scenario, and all respondents who received an instrument with a utilitarian product type (Instruments C, D, G, and H) are also presented with the same scenario.

The products used for this research are smartphone. Smartphone is a well-known product and has considerably high penetration rate. The smartphone that is the object of research is the Samsung brand, because this brand has various types with a wide price range, and the specifications can be categorized as hedonic products and utilitarian products. Based on the choice of price, specifications, and the year of release Samsung S10 was chosen to represent hedonic products and a Samsung M10 for utilitarian products. To ensure respondents are given random scenarios, the authors use Google Apps Script to build web applications that can direct respondents to random scenarios. The push notification messages for each instrument is shown in Table 3, and an example of the notification design is shown in Figure 2.

| Instrument | Push Notification Message (English Translation) |
|------------|-----------------------------------------------|
| Instrument A | Special Cashback Coupon Only for You! Clara, enjoy a 5% cashback coupon on up to 300K and 10K in free shipping for the Samsung S10 in your basket. Exciting, right? Check out now! |
| Instruments B and D | Many Advantages Await You! Enjoy 5% cashback on up to 300K and 10K in free shipping for more savings while you shop. Exciting, right? Check out now! |
| Instrument C | Special Cashback Coupon Only for You! Clara, enjoy 5% cashback coupon up to 300K and free shipping 10K for Samsung M10 in your basket for more saving. Exciting right? Check Now! |
| Instrument E | Don’t Miss This Opportunity! Clara, there are fewer than five Samsung M10s still in stock, and one is in your basket. Buy now or regret later! |
| Instruments F and H | Don’t Miss This Opportunity! Buy the product you want now, before it sells out! |
| Instrument G | Don’t Miss This Opportunity! Clara, there are fewer than five Samsung M10s still in stock, and one is in your basket. Buy now or regret later! |

V. RESULTS AND ANALYSES

A. RESPONDENT DEMOGRAPHY

The data that was collected for 24 days amounted to 722 datasets. The determination of the outlier data was assisted by a box-plot diagram. There were 77 pieces of data that were not be used in this study. The amount of data for each instrument was not balanced, so we used the lowest valid amount of data, which was 75. The selection
of 75 data for each instrument was randomly carried out. The demographics for the 600 datasets used still represented all the data obtained. A demographic summary of the data used in this study can be seen in Table 4.

### TABLE 4. Respondent demography.

| Variable                | Freq. | %  | Monthly Income (in Million Rupiahs) | Variable | Freq. | %  |
|-------------------------|-------|----|------------------------------------|----------|-------|----|
| Gender                  |       |    |                                     | Gender   |       |    |
| Male                    | 408   | 32%| < 0.5                               | 408      | 32%   |    |
| Female                  | 192   | 68%| 0.5–1                               | 192      | 68%   |    |
| Age (years old)         |       |    | 1–2.5                               | Age      |       |    |
| < 17                    | 3     | 1% | 2.5–5                               | < 17     | 3     | 1% |
| 17–25                   | 480   | 80%| 5–10                                | 17–25    | 480   | 80%|
| 26–35                   | 74    | 12%| >10                                 | 26–35    | 74    | 12%|
| 36–45                   | 10    | 2% | Online Shopping Experience (in months) | 36–45    | 10    | 2% |
| 46–55                   | 30    | 5% | < 1                                 | 46–55    | 30    | 5% |
| > 55                    | 3     | 1% | 1–12                                | > 55     | 3     | 1% |
| Education               |       |    | 12                                 | Education|       |    |
| High School             | 76    | 13%| Online Shopping Frequency (monthly) | High School | 76  | 13%|
| Diploma                 | 58    | 10%| < 3                                 | Diploma  | 58   | 10%|
| Bachelor’s              | 441   | 73%| 3–5                                 | Bachelor’s| 441 | 73%|
| Master’s                | 25    | 4% | >5                                  | Master’s | 25   | 4% |

### B. MANIPULATION TEST RESULTS

This manipulation test was used to ensure that each respondent truly understood the research attributes of the scenario and push notification in accordance with what was determined for each instrument. Testing was conducted for the independent variables. This manipulation test began with reliability testing and homogeneity testing, and then continued with an independent t-test. Cronbach’s alpha, composite reliability, and the average variance extracted value of all variables were good and supported the reliability of each variable.

Next, an independent t-test was carried out to ensure the instrument with the gain-framed message attribute and the instrument with the loss-framed message attribute had significantly different values. The results of the independent t-test showed that the respondents understood and expected the type of message-framing they would be given, because the value for the group receiving the gain-framed message ($M = 4.8950, SD = 0.73139$) differed significantly from the value for the group that received the loss-framed message ($M = 4.3367, SD = 0.77911$). The homogeneity test results showed that the data were not homogeneous ($F(1.598) = 6.844, p = 0.009$). This significant difference was indicated by the value of independent t-test with equal variances not assumed, because the data were not homogeneous ($t(595.63) = 9.050, p = 0.000$).

The independent t-test was carried out to ensure that instruments with hedonic product attributes and instruments with utilitarian product attributes had significantly different values. The results of the independent t-test showed that the respondents understood and expected the type of product they would be given, because the value for the group receiving the hedonic products ($M = 5.5150, SD = 1.10515$) differed significantly from the value of the group that received the utilitarian products ($M = 4.8467, SD = 1.14127$). The homogeneity test results indicated that the data were homogeneous ($F(1.598) = 0.001, p = 0.971$). This significant difference was indicated by the value of the independent t-test with equal variances assumed, because the data were homogeneous ($t(598) = 7.287, p = 0.000$).

Next, an independent t-test was carried out to ensure that the instruments with personalized message attributes and the instruments with general message attributes had significantly different values. The results showed that the respondents understood and expected the type of message-personalization, because the values for the groups that received the personalized messages ($M = 5.3083, SD = 1.51495$) differed significantly from the group values that received a general message ($M = 5.8300, SD = 1.40154$). The homogeneity test results showed that the data were not homogeneous ($F(1.598) = 5.022, p = 0.025$). This significant difference was indicated by the value of the independent t-test with equal variances not assumed, because the data were not homogeneous ($t(594.42) = –4.378, p = 0.000$).

### TABLE 5. CA, CR and AVE values.

| Variable                | Cronbach’s Alpha | Composite Reliability | Average Variance Extracted |
|-------------------------|------------------|-----------------------|---------------------------|
| Message Framing         | 0.716            | 0.875                 | 0.779                     |
| Product Type            | 0.747            | 0.884                 | 0.793                     |
| Message Personalization | 0.901            | 0.952                 | 0.908                     |
| Perceived Value         | 0.716            | 0.838                 | 0.639                     |
| Purchase Intention      | 0.850            | 0.909                 | 0.769                     |
C. HYPOTHESES TESTING

In accordance with the nature and the aims of this study which is to compare and analyze the design of push notification in more than one independent groups of respondents, ANOVA is chosen as the statistical tools in analyzing the data. Three-way ANOVA will be used in analyzing the Hypothesis 1, 2 and 3 to evaluate the difference of effect by independent variable of message framing, product type and message personalization on dependent variable of perceived value and product purchased intention (see Table 6). Interaction of variables in Hypotheses 4, 5, and 6 were tested using three-way ANOVA, then the simple primary effect of these hypotheses was tested using one-way ANOVA (see Table 6). Hypothesis 7 was tested using regression or mediation analysis (see Table 7).

| TABLE 6. Three-way ANOVA for perceived value of the product. |
|---------------------------------------------------------------|
| Source | df | MS | F | sig. |
| Message Framing (A) | 1 | 5.934 | 6.235 | 0.013 |
| Personalization (B) | 1 | 5.934 | 6.235 | 0.013 |
| Product Type (C) | 1 | 39.356 | 41.357 | 0.000* |
| A × B | 1 | 3.682 | 3.869 | 0.05 |
| A × C | 1 | 0.135 | 0.142 | 0.707 |
| A × B × C | 1 | 4.222 | 4.437 | 0.036 |
| Simple Effect | |
| A × B (Generalized) | 1 | 0.134 | 0.128 | 0.72 |
| A × B (Personalized) | 1 | 9.481 | 9.505 | 0.002 |
| A × C (Hedonic) | 1 | 2.139 | 1.608 | 0.206 |
| A × C (Utilitarian) | 1 | 3.929 | 6.449 | 0.12 |
| A × B (Generalized) × C (Hedonic) | 1 | 0.907 | 0.699 | 0.405 |
| A × B (Personalized) × C (Hedonic) | 1 | 9.127 | 7.081 | 0.009 |
| A × B (Generalized) × C (Utilitarian) | 1 | 2.160 | 3.561 | 0.61 |
| A × B (Personalized) × C (Utilitarian) | 1 | 1.779 | 2.906 | 0.090 |
| Error | | | | |
| Total | | | | 600 |

*less than 0.0001

| TABLE 7. Mediation analysis for purchase intention. |
|---------------------------------------------------------------|
| Message Framing → Purchase Intention | Message Framing → Perceived Value | Message Framing + Perceived Value → Purchase Intention |
| β | P-value | β | P-value | β | P-value |
| 0.257 | 0.000 | 0.256 | 0.000 | 0.106 | 0.001 | 0.639 | 0.000 |

From Tables 6 and 7, the result of the analysis shows that with a significance less than 0.005, the accepted hypotheses were H1, H2, H3, H4(a), H4(b), H5(b), H6(a), H6(c) and H7. However, three hypotheses were rejected: H5(a), H6(b), and H6(d).

VI. DISCUSSION AND IMPLICATIONS

A. EFFECT OF MESSAGE FRAMING ON THE PERCEIVED VALUE OF PRODUCTS

Based on the results of the hypothesis testing, message framing was found to have a significant effect on the perceived value of the product, which means that changes in message framing change the consumers’ assessments of products, as well. The type of message framing used in this study consisted of two types: gain-framed and loss-framed. Between the two, it turns out that gain-framed messages, or messages that offer benefits, further enhance consumers’ judgment of the product, compared to loss-framed messages, or messages that contain losses. This finding reinforces the findings of Lee et al. [13] and Buda and Zhang [19], who stated that messages containing profit offers are more effective than messages that contain risks. On the other hand, this finding contradicts Ganzach and Karsahi [18], who found that loss-framed messages are more effective in causing credit-card users to reuse their credit cards for shopping.

As predicted, the risk in a loss-framed message does not increase the perceived value of the product more than the gain-framed message. The risks described in this study are related to the risk of not being able to buy a product due to it being out of stock. In the electronic marketplace business environment, the same item can be sold by so many sellers, so the risk of running out of stock in one store less affects consumer behavior in shopping. This proves the theory proposed by Chang and Tseng [57] and Shapiro et al. [58] regarding risks that do not affect consumer behavior when shopping online.

B. EFFECT OF PRODUCT TYPE ON THE PERCEIVED VALUE OF PRODUCTS

Based on the results of the study, the type of product was found to have a significant effect on the perceived value of the product. Among hedonic products, which are often associated with luxury goods, and utilitarian products, which are often associated with basic needs, it turns out that utilitarian products significantly increase consumers’ perceived value of the products. This is in accordance with the research of Lu et al. [25], who found that consumers prefer a utilitarian product to a hedonic product, especially in the given scenario for this study, when the product will be used for oneself.

When the product meets the needs, people will create a strong reason to conduct a transaction [60]. On the other hand, hedonic products are goods that have an element of luxury, and buying hedonic products is often considered an insignificant expense and sometimes leads to guilt and regret [38]. These negative emotions tend not to significantly increase consumers’ perceived value of the hedonic products. The value of the product, which is not so high, makes the consumer’s desire to acquire it not too high, as well.

C. EFFECT OF MESSAGE PERSONALIZATION ON THE PERCEIVED VALUE OF PRODUCTS

Like message framing and product type, message personalization has a significant effect on the perceived value of the product. Adjustments to the message content will change the consumer’s assessment of the product, as well. In accordance with the hypothesis in this study, it was discovered that
personalized messages significantly increase the consumer perceived value of the product. This finding is in accordance with Li [39], whose research found that message personalization has a strong persuasive effect.

Personalized push notifications have the same effect as personalized product advertisements [22]. Personalized product advertisements also significantly influence consumer evaluations of those advertisements. Improved consumer product evaluations might be caused by personalized messages being processed better by the recipient [63]. In a personalized message, the sender of the message will treat the recipient of the message as a unique individual and design the contents of the message to match the characteristics and preferences of the message recipient [39], which can cause the recipient to feel they are being specially treated and that the message was intended specifically for them, which means the content will be processed better.

D. EFFECT OF MESSAGE-FRAMING INTERACTION AND MESSAGE PERSONALIZATION ON THE PERCEIVED VALUE OF PRODUCTS

Based on the results of the study, message framing was found to have significant interactions with message personalization as it related to the perceived value of the product, and message personalization moderates the effect thereof on the consumer’s perceived value of the product. In this study, it was found that personalized messages cause the perceived value of products to be higher than general messages, without considering the type of message framing. This finding is also in accordance with the research of Li [39] and Briñol and Petty [63], because personalization of a successful message provides a stronger persuasive effect, which means that the recipient is likely to respond and do what is asked of them in the message.

When examined in greater detail, message personalization has different effects on different types of message framing. In personalized messages, it was found that a gain-framed message, or a message that offers a profit, significantly increased consumer ratings of the product. This is in line with the study of the main effects of message framing on consumer ratings of products, which asserted that messages that contain benefits are more effective than messages that contain risks [13], [19].

In contrast to personalized messages, general messages do not cause consumers to judge products on gain-framed messages, or messages that offer benefits, and loss-framed messages, or messages that contain losses, are significantly different. This might be because it is likely that the recipient will not respond to non-personalized messages, because they feel the message is only an ordinary advertisement that is sent by smartphone apps for promotional purposes. The recipient may also feel that a similar message will be received again at a later date, so there is less urgency to respond. Therefore, any type of message framing does not significantly change consumers’ judgment of the product.

E. EFFECT OF MESSAGE-FRAMING INTERACTION AND PRODUCT TYPE ON THE PERCEIVED VALUE OF PRODUCTS

In this study, it was found that message framing did not have significant interactions with product types. This means that there was not enough evidence to state that the type of product moderates the effect of message framing as it relates to the perceived value of the product. Overall, when the product is of the utilitarian type, consumer ratings of the product are higher, no matter what type of message framing the push notification was given. This finding is in accordance with the study of the main effects of product type on the perceived value of the product, and it is also consistent with the research of Lu et al. [25], who found that consumers preferred to buy utilitarian products, or products for necessity, compared to hedonic products, or products for luxury.

We found that hedonic products do not affect consumer product assessments on gain-framed messages and loss-framed significantly different. A study by Lu et al. [25] found that because consumers prefer to buy utilitarian products, they pay less attention to push notifications for hedonic products. On the other hand, this finding contradicts research by Yang [37], who found that loss-framed messages are more effective than gain-framed messages when it comes to hedonic products. We also found that with utilitarian products, each message framing type had a different effect on the consumers’ perceived value of the product. In accordance with the proposed hypothesis, the gain-framed message significantly improves consumers’ judgment of the product, compared to the loss-framed message. This is in accordance with research from Lee et al. [13] and Yang [37], who found that messages that provide benefits will create preferences for advertisements for utilitarian products. Gain-framed-type messages make it easier for consumers to identify that the product is very useful and has a greater value, especially because the product is seen as a necessity.

F. EFFECT OF MESSAGE-FRAMING INTERACTION WITH MESSAGE PERSONALIZATION AND PRODUCT TYPE ON THE PERCEIVED VALUE OF PRODUCTS

This study found that the interaction between message framing, message personalization, and product type was significant as it related to the perceived value of the product. This means that by personalizing messages and different types of products, the effect of message framing on consumer ratings of products changes, as well. Overall, regardless of the message framing type, utilitarian-type products produce higher consumer ratings, compared to hedonic products, especially if the message is personalized.

When the message is a general message for both hedonic and utilitarian products, consumer ratings of the products for gain-framed and loss-framed messages did not differ significantly. General-content messages may be noticed less by the recipient, so the consumers’ ratings of the product were not significantly different.
Nevertheless, this study obtained interesting results for hedonic products. In contrast to other findings, where gain-framed messages always produce higher perceived value for products, the hedonic products with generalized and loss-framed messages were given higher perceived value. That is, this finding supports the results of research by Ganzach and Karshafi [18] and Yang [37], who found that loss-framed messages are more effective for hedonic products, even though the difference is not significant.

Personalized messages turned out to produce results that were not in accordance with the initial hypothesis. In hedonic products, it turns out that gain-framed, personalized message significantly increased consumer product ratings. For utilitarian products, gain-framed messages and loss-framed messages did not produce perceived value for significantly different products when the message was personalized.

G. EFFECT OF THE PERCEIVED VALUE OF PRODUCTS ON THE INTENTION TO PURCHASE THOSE PRODUCTS, AND THE MEDIATION THEREOF ON THE RELATIONSHIP BETWEEN MESSAGE FRAMING AND PURCHASE INTENTION

Results show that the perceived value of the product gives a positive influence on the purchase intention of the product and in line with study by Chu and Lu [65]. The effect of product purchase intentions starts with message framing and is partially mediated by the consumers’ perceived value of the product. This discovery, that push notifications that use message framing as a stimulus affect consumers’ ratings of products as organisms and cause them to respond in the form of product purchase intentions, is in accordance with the SOR theory, which explains how triggers affect someone’s affect and cognition, which causes a person to perform certain behaviors [55]. In this study, it was found that message framing can have a positive influence on perceived value, and perceived value can also have a positive effect on product purchase intentions. This finding further enriches the opinions of Chan et al. [8] and Chen and Yao [54] regarding the appropriateness of the use of the SOR theory as a basis for research on consumer buying behavior.

VII. CONCLUSION

This research was conducted to determine the effect of message framing, product type, and message personalization in push notifications for e-marketplace apps as they relate to product purchase intentions. The results showed that each mode of message framing had a different effect on the perceived value of the product, depending on the type of product and whether or not the message was personalized. Perceived value was found to significantly influence product purchase intentions and to partially mediate the relationship between message framing and product purchase intentions.

In general, when observed individually, message framing, product type, and message personalization each had a significant effect on the perceived value of the product. Gain-framed messages significantly increase the perceived value of the product. Personalized messages also significantly increase the perceived value of the product, so business owners would be wise to employ a personalization strategy to more effectively persuade their users to complete their abandoned transactions. Utilitarian products significantly increase the perceived value of products, because customer considers the products to be a necessity.

Message framing, product type, and message personalization have significant interactions in influencing the perceived value of the product. The generalized message for both hedonic and utilitarian products with gain-framed and loss-framed messages is not significantly impactful on the perceived value of the product. A personalized message for a hedonic product will significantly increase the perceived value of the product if the message is gain-framed. However, a personalized message for a utilitarian product will not significantly impact the perceived value of the product for either gain-framed or loss-framed messages.

Finally, gain-framed messages from both types of products lead to higher perceived value, thereby offering benefits to the message that further raise the perception of product value. From this result, the business-owner would be well-advised to compile content that offered benefits, especially with a personalized message, in order to persuade consumers more effectively to continue and complete the pending transaction.

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