The Fierce Competition of Shopee Battlefield Among Generation Z Consumers:
A Neuromarketing Perspective

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ABSTRACT

The shift in consumer buying patterns towards online purchases has led to a significant increase in the number of sellers using e-commerce platforms to promote their products. Shopee is one of the most popular e-commerce platforms in Indonesia. However, the rapid rise in the number of sellers on Shopee has resulted in intensified competition within the platform. E-commerce platforms typically offer various services to assist sellers in marketing their products, including organic and paid options. Paid services on e-commerce platforms can enhance product exposure. However, the effectiveness of these paid services is being questioned due to the large number of sellers utilizing them. This research aims to assess the significance of sellers using paid services in the competitive landscape of e-commerce platforms. The study adopts a quantitative approach and explores the topic from a neuromarketing perspective. Eye-tracking, a neuromarketing method that records and analyzes where consumers focus their attention and how they navigate and make purchases on digital platforms, is used in this research. The findings of this study indicate that there is no statistically significant difference in the time required to locate and select products sold by organic sellers and paid sellers. This research will help e-commerce platform providers improve their services for customers. The article also discusses the research implications and limitations in more detail.

Keywords: Business Competition, E-Commerce, Eye Tracking, Neuromarketing, Online Purchase, Paid Seller, Pupil Projection, Shopee.

1. INTRODUCTION

The e-commerce industry has experienced a significant growth trajectory in recent years, establishing itself as a pivotal platform for marketing and product sales [1]. In the digital era, online platforms play a paramount role in providing accessibility and convenience to consumers in their shopping endeavors [2]. Shopee has emerged as a prominent e-commerce platform in Indonesia, captivating widespread consumer interest and participation [3]. Its success can be attributed to its user-friendly interface, extensive product range, and competitive pricing.

Paid seller services have played a crucial role in enhancing user engagement and driving online sales. These services allow sellers to promote their products in a targeted manner through paying for increased exposure or accessing special features on e-commerce platforms [2]. By utilizing paid seller services, sellers can gain visibility, reach a broader audience, and effectively market their products [4]. However, while the effectiveness of paid seller services has been empirically demonstrated, there is still a need for a comprehensive understanding of their impact on consumer behavior and decision-making processes [5].

In this study, a neuromarketing approach will be employed to examine the neuropsychological responses of users towards paid seller services on the Shopee application [6]. Neuromarketing, which integrates knowledge from neuroscience and marketing, provides a robust theoretical foundation. It offers insights into how consumers process information, make decisions, and respond to marketing [7]. By combining neuromarketing with the utilization of eye tracking methods, this

research aims to shed light on the underlying cognitive and emotional processes associated with users' interactions with paid seller services [8], [9].

Eye tracking, a non-invasive technique, enables objective measurements of eye movements and visual attention [10]. By recording and analyzing participants' gaze patterns, researchers can gain valuable insights into which areas of the screen users focus on, how long their attention is held, and whether there are any specific patterns or preferences in their viewing behavior [11]. This information can provide a deeper understanding of how users engage with paid seller services and the effectiveness of different marketing strategies employed within the Shopee application [3].

The research will focus on Shopee's Generation Z users in Indonesia, as this demographic is known to be highly active in the e-commerce landscape. Generation Z individuals, aged between 18 and 24 years, represent a key market segment with distinct preferences and behaviors [12]. By examining their responses to paid seller services, this study will contribute to a better understanding of the effectiveness of these services in engaging and influencing Generation Z consumers [5].

The specific scope of the study will revolve around fashion products, which are highly popular among Generation Z consumers [13], [14]. This focus allows for a detailed analysis of how paid seller services impact users' perceptions, attitudes, and purchase intentions regarding fashion items. By investigating the neuropsychological responses of Generation Z users in relation to paid seller services, the study aims to uncover key insights that can inform marketing strategies, improve user experience, and ultimately drive higher sales conversions [15].

The findings of this research are expected to provide valuable insights into the effectiveness of paid seller services on the Shopee platform. By examining users' neuropsychological responses, the study will contribute to the growing body of knowledge on consumer behavior in the e-commerce context [15]. Additionally, the research outcomes will have practical implications for businesses and marketers, enabling them to optimize their marketing strategies and tailor their paid seller services to better engage and influence Generation Z consumers on the Shopee platform [16].

In conclusion, this study aims to investigate the neuropsychological responses of Shopee's Generation Z users towards paid seller services using a neuromarketing approach and eye tracking methods [17]. By examining users' gaze patterns and analyzing their responses, this research will provide valuable insights into the effectiveness of paid seller services in engaging and influencing Generation Z consumers. The findings will have practical implications for marketers,

enabling them to optimize their strategies on the Shopee platform and enhance the overall user experience.

2. LITERATURE REVIEW

2.1. The Surge in Generation Z Consumerism as E-commerce Users

Generation Z makes a significant contribution to the population of Indonesia. Generation Z encompasses individuals up to 24 years of age, with a maximum birth year of 2000 [18]. The population of Indonesia within the age range of 18-24 is approximately 21.43% [18]. This figure exceeds one-fifth of the total population in Indonesia, indicating that Generation Z, in terms of population size, holds a significant presence in Indonesia.

The rapid growth of Generation Z will have a significant impact on the economy of Indonesia in the future. This is supported by the increasing number of productive-age individuals in Indonesia [18]. As more members of Generation Z reach the age of 18 and above, they will be able to actively contribute to the economy of Indonesia [19]. Therefore, the contribution of Generation Z as a productive age group will play a significant role in the economy of Indonesia.

The ability of Generation Z to make independent business decisions drives their role in the economy. One of the simplest forms of business is the buying and selling process. With the support of e-commerce platforms and technology, it becomes easier for young productive age contributing to the economy [15]. Given these circumstances, the potential development of Indonesia's economy will largely depend on the initiatives of Generation Z [12]. Therefore, it is important to understand the purchasing behavior of Generation Z through e-commerce platforms in Indonesia [20].

2.2. Neuromarketing as a Measure of Neuropsychological Responses of Users to Digital Services

Marketing is an essential aspect of the business world aimed at increasing the sales of products or services [21]. One of the approaches currently being utilized in marketing is the physiological approach. The physiological approach in marketing emphasizes the influence of biological and physiological factors on consumer behavior. This includes factors such as needs, hunger, sexual drive, and others [22].

Neuromarketing is a field that combines neuroscience and marketing to explore how consumer thoughts and behaviors are determined by biological processes in the brain [22]. Through technologies such as MRI, EEG, and eye-tracking, researchers can study

consumers' brain responses to products, brands, and advertising campaigns.

An important aspect of neuromarketing is understanding how emotions influence purchasing decisions [23]. Research has shown that brain areas associated with emotions, such as the amygdala, play a role in determining whether someone will purchase a product or not. Therefore, companies can enhance their marketing strategies by creating advertising campaigns that evoke consumers' emotions.

The most commonly used techniques in neuromarketing are brain scanning technologies such as EEG (electroencephalography) and fMRI (functional magnetic resonance imaging). These technologies are used to measure brain activity when consumers make decisions or respond to specific products or advertisements [24]. Some studies have shown that strong emotions can influence consumer decision-making [25]. For example, emotionally evocative advertisements can trigger positive brain responses and increase the likelihood of consumers purchasing a product.

In the application of the physiological approach, companies can use techniques such as neuromarketing to analyze consumers' brain responses to the products or services being offered. Neuromarketing is a method that combines neuroimaging technologies like MRI and EEG with consumer behavior analysis to understand how products or services are received by consumers [24].

Neuromarketing can also be used to evaluate the effectiveness of advertisements [7]. Technologies like eye-tracking can be employed to measure how often consumers look at a sign or logo, while EEG technology can gauge the level of consumer brain engagement in an advertisement [26]. This can assist companies in determining whether their advertisements are effective and making necessary adjustments. However, it is important to note that the physiological approach in marketing also has some limitations. One of them is that not all consumers will respond to products or services in the same way [21]. Additionally, some consumers may feel uncomfortable with the techniques employed in the physiological approach and may refuse to participate in studies [22].

2.3. Effectiveness of Paid Seller Services in E-Commerce

The competitive landscape in the digital world has experienced a significant increase. This growth has been accelerated by advancements in technology and the widespread availability of digital business infrastructure [27]. The digital realm is not only characterized by free competition but also by competition at the level of e-commerce platforms themselves [28]. The ease of

selling has become one of the advantages offered by e-commerce platforms, leading sellers to leverage these facilities. On one hand, this situation supports the economic growth of communities [29]. However, on the other hand, it has negative consequences due to the intensified competition in the digital business space resulting from an increasing number of business players.

As an e-commerce platform provider, Shopee offers several facilities that can be utilized by sellers on the platform. There are various categories of sellers within the Shopee e-commerce platform, categorized based on the services chosen by each seller [30]. These categories include organic sellers, star sellers, star+ sellers, and the highest category being Shopee Mall. The differences between these categories lie in the accessible features [5]. One of the most advantageous features for sellers is the opportunity to participate in promotions and advertisements within the Shopee platform. This advantage helps sellers in promoting their products, ultimately leading to increased sales and overall business revenue [1].

The difference in promotional and advertising facilities available to sellers on the Shopee e-commerce platform leads to an imbalance in competition. When we consider the two extreme points in the seller categories on the Shopee platform, namely organic sellers and Shopee Mall, it is evident that the imbalance in capabilities and competitive potential results in Shopee Mall sellers being more easily noticed or discovered by potential buyers [31].

Although the capabilities and competitive potential between organic sellers and paid sellers are unbalanced, the significance of the benefits provided by paid sellers is now being questioned. This is attributed to the increasing number of sellers opting to become paid sellers [5]. When numerous sellers have similar competitiveness and employ the same methods, such a approach no longer significantly enhances business performance [27]. This is evident in the growing difficulty of conducting sales through the e-commerce platform due to the overwhelming number of competitors. Therefore, the researchers in this study propose the following hypothesis.

H0: *There is no significant difference in the time required for customers to find products sold by organic sellers and paid sellers.*

Ha: *There is a significant difference in the time required for customers to find products sold by organic sellers and paid sellers.*

3. METHODOLOGY

The study employed a mixed-methods approach. The qualitative approach was used to gather information

from participants' statements regarding their shopping frequency and the product categories they have purchased on the Shopee e-commerce platform. Meanwhile, the quantitative approach was utilized to gather information from the timing records obtained from the participants.

To minimize bias resulting from the heterogeneity of the research subjects, this study applied specific criteria to select the participants. The criteria included being between the ages of 18-24 and having a minimum of one experience in purchasing products through the Shopee e-commerce platform. With these criteria in place, a total of 15 participants were included in the study, consisting of 7 males and 8 females who had prior shopping experiences on the e-commerce platform.

The study utilizes neuromarketing techniques to explore the research topic. One of the technologies employed to obtain neuromarketing data is the eye gaze tracker. In this research, the Tobii Eye Tracker 5 device is used as the eye gaze tracker. With this device, it is possible to track the direction of a person's gaze on a given medium. The recorded eye gaze data is then utilized as a measure of the time taken to locate and select the products sold by the sellers.

In addition to the eye gaze recordings, screen captures are also necessary for the study. The screen captures are used to observe the shopping process followed by the research participants. These screen captures are recorded using the OBS application, with a timeframe embedded to track the duration of the process.

There are two types of data that will be analyzed in this study. The first type of data, demographic and customer behavior data, will be analyzed using descriptive statistical analysis. The second type of data, the time required to locate and select products sold by organic sellers and paid sellers, will be analyzed using inferential statistical analysis employing the Independent-Sample T-Test technique to determine the statistical differences between the two data groups.

4. RESULT

This study analyzed the data using two different methods. The results of this research will be presented in two distinct sections. The first section focuses on the analysis of demographic and behavioral data of the research subjects using descriptive statistics. The second section entails the analysis of eye-gazing duration data using inferential statistics.

4.1. Demographic and Behavioral Data

Several demographic and behavioral pieces of information have been collected from the research subjects' data. The results will be presented in sequential order, starting with gender, previous buying frequency, and previous product categories. Presented below are several data points that depict the subjects' characteristics in this study.

Table 1. Analysis of Demographic and Behavioral Data

Demographic Profile	Research Subject (n=15)	
	Frequencies	Percentage
Gender		
Male	7	46,7%
Female	8	53,3%
Buying Frequency		
1 (Never)	0	0,0%
2	1	6,7%
3	3	20,0%
4	5	33,3%
5 (Often)	6	40,0%
Product Category		
Clothes	13	21,0%
Digital Product	4	6,5%
Electronics	4	6,5%
Fashion	8	12,9%
Accessories	8	12,9%
Foods	3	4,8%
Hobbies	4	6,5%
Household Needs	6	9,7%
Skincare	6	9,7%
Stationery	6	9,7%
Other		

Sources: Data processed by SPSS

As shown in Table 1, there is a distribution of gender among the research subjects. The male gender accounts for a percentage of 46.67%, while the female gender comprises 53.33%. This indicates that the percentages of male and female genders are approaching balance, aiming to mitigate bias towards any particular gender.

Another data presented in Table 1 is the buying frequency. This data illustrates the previous buying frequency on the e-commerce platform carried out by the study subjects. It can be observed that 40% of the subjects involved in this research frequently engage in product buying through the e-commerce platform. This indicates that the subjects participating in this study have many experiences or are accustomed to making product purchases on e-commerce platforms.

The last data presented in Table 1 is the product category. This data indicates the product categories that have been purchased by the research subjects. Based on the collected data, the category that has been purchased the most is clothing, accounting for a percentage of 21%. This indicates that the research subjects involved align with the research design that focuses on fashion products as the experimental objects.

Visits and purchases on an e-commerce platform serve as indicators of a seller's performance [27]. Based on the data collected from the experiment in this study, visit and purchase figures were obtained for each type of seller on the Shopee e-commerce platform. The highest P/V (Purchase/Visit) ratio is observed in Star+ Sellers (40%), with 10 visits and 4 purchases. Following that, the second-highest P/V ratio is found in Organic Sellers (18.18%), with 11 visits and 2 purchases. Lastly, the lowest P/V ratio is observed in Shopee Mall (17.31%), with 52 visits and 9 purchases. Therefore, it can be inferred that the largest number of purchases is made from sellers categorized as Shopee Mall, although they have the lowest P/V ratio due to the higher number of visits to such sellers. A summary of visit and purchase figures for each seller category can be found in Table 2.

Table 2. The Number of Visit and Purchase for Each Seller category

Category	Visit	Purchase	P/V Ratio
Shopee Mall	52	9	17,31%
Star+ Seller	10	4	40%
Star Seller	0	0	0
Organic Seller	11	2	18,18%
Total	73	15	

Sources: Data processed by SPSS

4.2. Group Differences Test

One of the assumptions that needs to be met for conducting an independent-samples t-test is that the data being tested should follow a normal distribution [32]. In this study, the Kolmogorov-Smirnov Normality Distribution Test was used to assess whether the collected data exhibited a normal distribution. Based on the normality tests conducted, a significance value of 0.071 was obtained for Time (Paid Seller), and a significance value of 0.200 was obtained for Time (Organic Seller). Consequently, it can be concluded that both data groups (Time-Paid Seller and Time-Organic Seller) are normally distributed since their significance values are above 0.05 (at a 95% confidence level). A summary of the normality tests conducted can be seen in Table 3.

Table 3. K-S Normality Distribution Test

Variable	Kolmogorov-Smirnov		
	Statistic	df	Sig.
Time (Paid Seller)	.138	37	0.071
Time (Organic Seller)	.255	5	0.200

Sources: Data processed by SPSS

The purpose of this study is to examine the differences between groups in terms of the time required to select and visit organic and paid sellers. The independent-samples t-test is used to determine whether the two data groups are statistically different or not [32].

Based on the Independent-Sample T-Test conducted, the significance value for the F value is found to be 0.113. This suggests that the two data groups are assumed to have equal variances. However, to determine whether the two groups are significantly different, the significance value of the T-Test needs to be examined. The T-Test significance value for both groups is 0.114. Since the T-Test significance value is greater than 0.05 (at a 95% confidence level), the null hypothesis (H_0) is accepted, indicating that there is no statistically significant difference between the two groups. A summary of the Independent-Sample T-Test results can be seen in Table 4.

Table 4. Independent-Sample T-Test

Variable	Equality of Variances	
	F	Sig.
Time	2.618	.113
Variable	T-Test		
	t	df	Sig. (2-Tailed)
Time (Equal var. assumed)	1.614	40	.114

Sources: Data processed by SPSS

5. DISCUSSION

Based on the results obtained regarding the demographics and behavior of the research subjects, it is known that 40% of the research subjects frequently make purchases through the e-commerce platform. As for the product category that is most commonly purchased through the e-commerce platform, it is clothing. This finding is consistent with previous research that states that Generation Z has a deeper experience in interacting with digital businesses, especially shopping through e-commerce platforms. Furthermore, previous studies have also mentioned that the product category that is most commonly purchased through e-commerce platforms is fashion-related items, thus the findings of this research align with previous studies that have examined the same topic [15].

An interesting phenomenon is observed in the P/V ratio performance of sellers on the e-commerce platform. The findings of this study reveal that for sellers in the Shopee Mall category, there were 52 visits with 9 purchases, resulting in a P/V ratio of 17.31%. On the other hand, for sellers in the organic seller category, there were 11 visits with 2 purchases, resulting in a P/V ratio of 18.18%. These results indicate that the conversion rate of organic sellers is higher compared to Shopee Mall (paid sellers). This can be attributed to the difference in categories, which also leads to different exposure levels. Shopee Mall, being a higher-tier category, has a higher chance of exposure, resulting in increased visits. However, the process of making a purchase is different. This phenomenon aligns with

previous research stating that higher exposure increases visit performance on an e-commerce platform. However, the research also suggests that the consumer journey towards making a purchase involves multiple stages, potentially leading to a lower conversion rate compared to visit numbers [2], [3].

The results of the difference group analysis in this study indicate that there is no significant statistical difference in the time required to search and select products sold by organic sellers and paid sellers. This finding contradicts previous research stating that sellers who pay on e-commerce platforms have better visibility, thus increasing conversion rates among visitors [5]. This phenomenon occurs because consumers who visit and purchase products from organic sellers are already aware and focused on the products sold by those sellers from the beginning. As a result, the time required to search and select products sold by organic sellers is shortened.

6. CONCLUSION

Generation Z holds a significant contribution to the economy, supported by the increasing number of productive individuals capable of making purchasing decisions. To seize these opportunities, sellers leverage e-commerce platforms to promote their products. In order to enhance their competitiveness, e-commerce platform providers offer different seller categories with varying features. However, due to the increasing number of sellers opting to become paid sellers, the benefits of such a category are being questioned. This concern is further reinforced by the findings of this research. Based on the analysis conducted, it has been proven that there is no significant difference in the time required to discover and select products offered by organic sellers compared to paid sellers. This information can be valuable for sellers utilizing e-commerce platforms to tailor their marketing strategies accordingly. Furthermore, the results of this study can also serve as feedback for e-commerce platform providers to improve the quality of their services, ensuring that sellers receive commensurate benefits based on their chosen category.

7. LIMITATION

The authors acknowledge several limitations in this study. The first limitation pertains to the time constraint during data collection. The imposed time constraint may have led to a simulation that does not accurately reflect real-life conditions, as buyers on e-commerce platforms typically spend considerable time comparing products before making a purchase. The second limitation concerns the device used, which was limited to desktop computers. This limitation may have resulted in a simulation that does not align with everyday conditions,

as purchases are commonly made on mobile devices, which can affect familiarity with menu positions and functions.

AUTHORS' CONTRIBUTIONS

Each author has made specific contributions to this research. Suryo Hadi Wira Prabowo serves as the primary author of this article. Cesya Rizkika Parahiyanti is the corresponding author. Yana Respati Dewi and Fatwah Inna Aulisaina have contributed to the execution of the research and writing of the article. Lastly, Norzalita Abd Aziz, as an external researcher, has made contributions to the brainstorming of research ideas for this study.

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REFERENCES

[1] M. Skare, B. Gavurova, and M. Rigelsky, "Innovation activity and the outcomes of B2C, B2B, and B2G E-Commerce in EU countries," *J. Bus. Res.*, vol. 163, 2023, doi: 10.1016/j.jbusres.2023.113874.

[2] T. M. König, N. Hein, and V. Nimsgern, "A value perspective on online review platforms: Profiling preference structures of online shops and traditional companies," *J. Bus. Res.*, vol. 145, pp. 387–401, Jun. 2022, doi: 10.1016/j.jbusres.2022.02.080.

[3] Nofrizal, U. Juju, Sucherly, A. N, I. Waldelmi, and Aznuriyandi, "Changes and determinants of consumer shopping behavior in E-commerce and social media product Muslimah," *J. Retail. Consum. Serv.*, vol. 70, p. 103146, Jan. 2023, doi: 10.1016/j.jretconser.2022.103146.

[4] M. B. Gulfraz, M. Sufyan, M. Mustak, J. Salminen, and D. K. Srivastava, "Understanding the impact of online customers' shopping experience on online impulsive buying: A study on two leading E-commerce platforms," *J. Retail. Consum. Serv.*, vol. 68, p. 103000, Sep. 2022, doi: 10.1016/j.jretconser.2022.103000.

[5] C. Hao and L. Yang, "Platform advertising and targeted promotion: Paid or free?," *Electron. Commer. Res. Appl.*, vol. 55, p. 101178, Sep. 2022, doi: 10.1016/j.elerap.2022.101178.

[6] F. R. Mashrur *et al.*, "An intelligent neuromarketing system for predicting consumers' future choice from electroencephalography signals," *Physiol. Behav.*, vol. 253, 2022, doi: 10.1016/j.physbeh.2022.113847.

[7] N. Hamelin *et al.*, "Storytelling, the scale of persuasion and retention: A neuromarketing approach," *J. Retail. Consum. Serv.*, vol. 55, 2020, doi: 10.1016/j.jretconser.2020.102099.

[8] H. Pratikto, S. H. Wira Prabowo, A. Murdiono, and A. Basuki, "The Role of Business Simulator Games Implementation in Improving the Ability of Analysis and Business Decision Making Independently for Students (Literature Research)," *KnE Soc. Sci.*, vol. 3, no. 11, p. 1005, Mar. 2019, doi: 10.18502/kss.v3i11.4067.

[9] S. Hadi Wira Prabowo *et al.*, "Making of Thinkgather.com As Collaborating and Networking Media for Researchers," *KnE Soc. Sci.*, Jul. 2020, doi: 10.18502/kss.v4i9.7320.

[10] S. H. W. Prabowo, A. Murdiono, J. A. Martha, I. Zutiasari, and N. M. H. N. Hashim, "Effectiveness of Website Role Play Game-Business Simulator (SIMBIZ-RPG) as a Life-Based Learning Media in Entrepreneurship Courses," in *3rd International Conference on Halal Development (ICHaD 2022)*, 2023, pp. 3–9, doi: https://doi.org/10.2991/978-94-6463-188-3_2.

[11] A. Hakim, S. Klorfeld, T. Sela, D. Friedman, M. Shabat-Simon, and D. J. Levy, "Machines learn neuromarketing: Improving preference prediction from self-reports using multiple EEG measures and machine learning," *Int. J. Res. Mark.*, vol. 38, no. 3, pp. 770–791, Sep. 2021, doi: 10.1016/j.ijresmar.2020.10.005.

[12] M. C. Mason, G. Zamparo, A. Marini, and N. Ameen, "Glued to your phone? Generation Z's smartphone addiction and online compulsive buying," *Comput. Human Behav.*, vol. 136, p. 107404, Nov. 2022, doi: 10.1016/j.chb.2022.107404.

[13] S. H. W. Prabowo, A. Murdiono, R. Hidayat, W. Rahayu, and S. Sutrisno, "Digital Marketing Optimization in Artificial Intelligence Era by Applying Consumer Behavior Algorithm," *Asian J. Entrep. Fam. Bus.*, vol. 3, no. 1 SE-Articles, Jul. 2019, [Online]. Available: https://www.perwiraindonesia.com/ajefb/index.php/jurnalAJEFB/article/view/40.

[14] C. R. Parahiyanti, S. H. W. Prabowo, Y. R. Dewi, N. A. Aziz, and E. Yunitasari, "Creating Satisfaction, Loyalty, and Competitive Advantage for Banking Industry: The Roles of Customer Relationship Management (CRM) in the Digital Era," in *Proceedings of the BISTIC Business Innovation Sustainability and Technology International Conference (BISTIC 2022)*, 2023, pp. 380–392, doi: 10.2991/978-94-6463-178-4_38.

[15] W. Guo and Q. Luo, "Investigating the impact of intelligent personal assistants on the purchase intentions of Generation Z consumers: The moderating role of brand credibility," *J. Retail. Consum. Serv.*, vol. 73, p. 103353, Jul. 2023, doi: 10.1016/j.jretconser.2023.103353.

[16] S. H. W. Prabowo, A. Murdiono, J. A. Martha, I. Zutiasari, and S. M. A. Murad, "Gamification of Ubiquitous-Based Learning Media as an Initiative of Open-World Metaverse Conversion for Problem Based Learning (PBL) in Business and Management Courses," in *BISTIC Business Innovation Sustainability and Technology International Conference (BISTIC 2022)*, 2023, pp. 86–97, doi: 10.2991/978-94-6463-178-4_10.

[17] S. H. W. Prabowo, "IMPLEMENTASI INTERNET OF THINGS DALAM DUNIA USAHA," *KEWIRAUSAHAAN (ERA Soc. 5.0)*, p. 161, 2023.

[18] Mudjahidin, N. L. Sholichah, A. P. Aristio, L. Junaedi, Y. A. Saputra, and S. E. Wiratno, "Purchase intention through search engine marketing: E-marketplace provider in Indonesia," *Procedia Comput. Sci.*, vol. 197, pp. 445–452, 2021, doi: 10.1016/j.procs.2021.12.160.

[19] N. Kusumawardhani, R. Pramana, N. S. Saputri, and D. Suryadarma, "Heterogeneous impact of internet availability on female labor market outcomes in an emerging economy: Evidence from Indonesia," *World Dev.*, vol. 164, p. 106182, Apr. 2023, doi: 10.1016/j.worlddev.2022.106182.

[20] M. Mulyani, S. Prabowo, V. Wicaksono, and H. Paksi, "Pengembangan Media Pembelajaran E-Materi untuk Meningkatkan Minat dan Motivasi Belajar Mahasiswa pada Matakuliah Konsep Dasar PPKn," *Sekol. Dasar Kaji. Teor. dan Prakt. Pendidik.*, vol. 31, no. 2, pp. 151–161, 2022.

[21] A. Behl, N. Jayawardena, A. Nigam, V. Pereira, A. Shankar, and C. Jebarajakirthy, "Investigating the revised international marketing strategies during COVID-19 based on resources and capabilities of the firms: A mixed method approach," *J. Bus. Res.*, vol. 158, 2023, doi: 10.1016/j.jbusres.2023.113662.

[22] P. Hu, Y. Gong, Y. Lu, and A. W. Ding, "Speaking vs. listening? Balance conversation attributes of voice assistants for better voice marketing," *Int. J. Res. Mark.*, 2022, doi: 10.1016/j.ijresmar.2022.04.006.

[23] G. Viglia, G. Zaefarian, and A. Ulqinaku, "How to design good experiments in marketing: Types, examples, and methods," *Ind. Mark. Manag.*, vol. 98, pp. 193–206, 2021, doi: 10.1016/j.indmarman.2021.08.007.

[24] S. Bhardwaj, G. A. Rana, A. Behl, and S. J. Gallego de Caceres, "Exploring the boundaries of

Neuromarketing through systematic investigation," *J. Bus. Res.*, vol. 154, 2023, doi: 10.1016/j.jbusres.2022.113371.

[25] R. Pereira, F. M. Córdova, and H. A. Díaz, "Some experiences in Neuromarketing: Moving from White papers to Scientific inquiries," *Procedia Comput. Sci.*, vol. 199, pp. 1409–1415, 2021, doi: 10.1016/j.procs.2022.01.178.

[26] T. A. Kurniawan, C. Meidiana, M. H. Dzarfan Othman, H. H. Goh, and K. W. Chew, "Strengthening waste recycling industry in Malang (Indonesia): Lessons from waste management in the era of Industry 4.0," *J. Clean. Prod.*, vol. 382, 2023, doi: 10.1016/j.jclepro.2022.135296.

[27] J. Ballerini, D. Herhausen, and A. Ferraris, "How commitment and platform adoption drive the e-commerce performance of SMEs: A mixed-method inquiry into e-commerce affordances," *Int. J. Inf. Manage.*, p. 102649, Apr. 2023, doi: 10.1016/j.ijinfomgt.2023.102649.

[28] T. P. Böttcher, J. Weking, A. Hein, M. Böhm, and H. Krcmar, "Pathways to digital business models: The connection of sensing and seizing in business model innovation," *J. Strateg. Inf. Syst.*, vol. 31, no. 4, 2022, doi: 10.1016/j.jsis.2022.101742.

[29] A. Charina, G. Kurnia, A. Mulyana, and K. Mizuno, "Sustainable Education and Open Innovation for Small Industry Sustainability Post COVID-19 Pandemic in Indonesia," *J. Open Innov. Technol. Mark. Complex.*, vol. 8, no. 4, 2022, doi: 10.3390/joitmc8040215.

[30] S. Hadi Wira Prabowo *et al.*, "User's Technology Acceptance of thinkgather.com App-Based Platform: Collaboration and Networking App for Researchers," *KnE Soc. Sci.*, Apr. 2020, doi: 10.18502/kss.v4i7.6867.

[31] L. E. Valdez-Juárez, D. Gallardo-Vázquez, and E. A. Ramos-Escobar, "Online buyers and open innovation: Security, experience, and satisfaction," *J. Open Innov. Technol. Mark. Complex.*, vol. 7, no. 1, pp. 1–24, 2021, doi: 10.3390/joitmc7010037.

[32] J. F. Hair, J. J. Risher, M. Sarstedt, and C. M. Ringle, "When to use and how to report the results of PLS-SEM," *Eur. Bus. Rev.*, vol. 31, no. 1, pp. 2–24, Jan. 2019, doi: 10.1108/EBR-11-2018-0203.