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The Impact of Artificial Intelligence on Generation Z Customer Experience in Agricultural E-Commerce: A Case Study of Shopee in Vietnam

Hien Thi Thu Hoang , Ha Thi Thu Do ^{*} , Anh Phan 

Faculty of Banking, Banking Academy of Vietnam, Hanoi 100000, Vietnam

ABSTRACT

The study aims to explore the impact of artificial intelligence on the online shopping experience of Generation Z consumers, focusing on the agricultural products offered on online shopping platforms such as Shopee in Vietnam. The study assesses the main features of artificial intelligence, including AI-based chatbots, AI-based price generation, AI-based recommendation systems, and AI-based image search, and their contributions to the shopping experience, personalization, and satisfaction, especially for products such as organic fruits, vegetables, and rice, which accounted for 20 percent of the sales of Shopee in Vietnam in 2024. The study is based on a quantitative analysis of behavioral patterns and perceptions and reveals the impact of artificial intelligence on the shopping experience of Generation Z consumers, thereby contributing to the development of the global agricultural economy and food security in developing countries. The study also reveals the impact of artificial intelligence on the shopping behavior and loyalty of young Vietnamese consumers in the digital agricultural economy, which is in line with the recent initiatives of the Food and Agriculture Organization on artificial intelligence-based agrifood systems.

Keywords: Artificial Intelligence; Agricultural E-Commerce; Customer Experience; Generation Z; Technology Acceptance Model; Shopee; Vietnam Agriculture

*CORRESPONDING AUTHOR:

Ha Thi Thu Do, Faculty of Banking, Banking Academy of Vietnam, Hanoi 100000, Vietnam; Email: hadtt@hvn.edu.vn

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1. Introduction

Artificial intelligence represents a transformative force across various sectors, particularly in business and e-commerce, where it enables machines to simulate human cognition, analyze data, and support decision-making^[1]. In the case of e-commerce, artificial intelligence improves the customer experience through personalized recommendations, pricing, and analytics of consumer behavior^[2]. Artificial intelligence, through the analysis of large amounts of data, helps in the identification of market trends, thus ensuring customer loyalty and business efficiency^[3]. In Vietnam, the integration of artificial intelligence has helped boost agricultural trade, with Shopee, an e-commerce platform, helping in the export of agricultural products and reducing product waste through predictive analytics^[4].

Generation Z, born between 1997 and 2012, has grown up with the rapid development of technology, such as the internet, smartphones, and social media. Generation Z, or digital natives, require speed, personalization, and transparency in their services^[5]. Thus, the experience of e-commerce for Generation Z includes perceptions of the platform, which range from product discovery to post-purchase support, with seamless interactions, technological reliability, and artificial intelligence support^[6]. In the case of agricultural e-commerce, the choice of Generation Z to consume sustainable products, such as organic rice and fruits, leads to the adoption of artificial intelligence, where 78% of the online youth in Vietnam utilize artificial intelligence tools in 2025^[6, 7].

Although previous studies have investigated the business value of artificial intelligence, it is interesting to conduct further research on the customer experience of artificial intelligence, especially in the context of e-commerce. Generation Z, who are known to be very tech-savvy and always look for convenient ways to do things, is another area that needs to be discussed, especially with regard to Shopee, as previous studies were not very specific about Generation Z^[8]. The purpose of this study was to examine the impact of artificial intelligence on Generation Z's experience with regard to e-commerce, especially with regard to agricultural products, and the role of artificial intelligence in improving the experience.

One of the most significant contributions of this cur-

rent study is the inclusion of all four variables of artificial intelligence: chatbots, recommendation systems, proactive pricing, and image search in one model to provide a holistic view of all four variables' impact on Generation Z consumers, unlike the models used in previous studies that were narrow and did not provide a comprehensive view^[9]. Another important contribution of the present study is the application of the suggested model in the context of the e-commerce market in Vietnam, where the integration of artificial intelligence has both opportunities and challenges for engaging Generation Z consumers in the digital agricultural market^[6, 10]. The proposed model provides insights into the strategies for the effective deployment of artificial intelligence, with significant implications for global agricultural economics through the increased trade of Vietnam's agricultural exports^[11].

2. Literature Review

2.1. Theoretical Background

The Technology Acceptance Model, as suggested by Davis (1989)^[12], forms the basic framework for the acceptance of technology. It suggests that the perceived usefulness of the technology, i.e., the extent to which it improves performance, and perceived ease of use, i.e., the extent to which it can be used without great effort, influence the intentions and behaviors of the users. It is in this sense that this theory can be said to be better and more applicable in explaining the behavior of Generation Z toward the acceptance of technology, compared to other highly accepted theories like the Theory of Reasoned Action (TRA), Theory of Planned Behaviour (TPB), Unified Theory of Acceptance and Use of Technology (UTAUT), as suggested by Ajzen (1991)^[13], Fishbein and Ajzen (1975)^[14], and Venkatesh et al. (2003)^[15], respectively. It is because the interaction of Generation Z with the artificial intelligence of the technologies in the e-commerce platform, like Shopee, is highly influenced by the usefulness of the technology in improving the efficiency of the shopping experience. The Theory of Reasoned Action and the Theory of Planned Behaviour, on the other hand, emphasize attitude, subjective norm, and the influence of moral obligation, which have been

omitted in this study. Similarly, the Unified Theory of Acceptance and Use of Technology, although it includes facilitating conditions and social influence, can only be applicable in the acceptance of technology in the work environment, whereas in this study, the acceptance of AI by Generation Z in the agricultural e-commerce platform is considered.

In the context of e-commerce platforms like Shopee, artificial intelligence systems are considered useful and accessible by Generation Z, thereby encouraging their continued use^[15]. In this study, the Technology Acceptance Model is used to examine the effects of artificial intelligence systems as independent variables on Generation Z shopping experiences as a dependent variable. The independent variables are useful in improving Generation Z shopping experiences, as they provide more personalization, support, and search convenience, thus supporting the concept of perceived usefulness. On the other hand, the artificial intelligence systems are easy to use in the e-commerce platforms such as Shopee, as illustrated in the chatbots and image search results, thus supporting the concept of perceived ease of use, thereby encouraging Generation Z to continue using the artificial intelligence systems^[16]. The Technology Acceptance Model helps in understanding the artificial intelligence adoption process in e-commerce platforms such as Shopee, especially in relation to Generation Z.

Ease of use is another factor that affects adoption; this is in line with Generation Z's familiarity with technology, which will encourage the adoption of easily used artificial intelligence on Shopee. Ease of use will lead to satisfaction, which in turn will encourage attachment to the platform and thus lead to adoption^[17]. The Technology Acceptance Model depicts the impact of ease of use and usefulness on the adoption of artificial intelligence by Generation Z.

2.2. Artificial Intelligence in Agricultural E-Commerce and the Global Agricultural Economy

In the global agricultural market, the impact of artificial intelligence is significant in terms of the accessibility of agricultural products in the market, especially in developing countries such as Vietnam, where Shopee

helps in the sale of vegetables, rice, and organic fruits in order to enhance food security. According to the Food and Agriculture Organization (2021)^[11], the impact of artificial intelligence is significant in that it reduces agricultural losses by 30% through demand forecasting, pricing, and personalization of recommendations to young consumers. Recent updates from the Food and Agriculture Organization from 2024 to 2025 highlight the impact of artificial intelligence in crop monitoring and digital trade, especially through the use of large language models to assist smallholder farmers in predicting prices^[18].

Recent studies also show the impact of artificial intelligence on agricultural trade. For example, Huang and Rust (2021)^[3] show the impact of artificial intelligence on e-commerce recommendations, which can improve the access of small-scale farmers to markets and increase the revenue earned by Asian countries by 20–25%. Furthermore, artificial intelligence image search helps Generation Z understand organic products, thus promoting sustainable consumption. Artificial intelligence image search also helps bridge the gap between the rural and urban populations. For example, artificial intelligence helps Shopee promote farm products in Vietnam through the Sustainable Agriculture Strategy 2021–2030, thus contributing to the 14% GDP contribution in 2024. The artificial intelligence market in Vietnam's agricultural sector was worth 8.72 million US dollars in 2024, with Shopee Food Map contributing to the Viet-GAP standard for farm products^[19]. Despite the positive impact of artificial intelligence on the agricultural sector, there are still some challenges associated with artificial intelligence, especially with regard to the gap that might arise between the rural and urban populations. Artificial intelligence has the potential to increase disparities among farmers in rural areas, thereby posing a threat to food security at the global level. This article bridges the gap that exists in previous studies by using the technology acceptance model with regard to artificial intelligence and Shopee-based e-commerce, targeting Generation Z as the consumer of farm products in Vietnam^[20].

2.2.1. Artificial Intelligence

Artificial intelligence represents a set of systems that have the ability to simulate intelligence, such as

learning, reasoning, and adapting^[1]. Artificial intelligence within the e-commerce environment involves the use of algorithms to personalize, perform analytics, and automate^[2]. Artificial intelligence is represented by the use of chatbots, recommendations, image search, and prices, which improve the behavior of e-commerce platforms such as Shopee. Artificial intelligence revolutionizes the interaction between the customer and the online platform, retains the customer with personalized solutions, and is essential for perishable agricultural products^[21].

2.2.2. AI-Chatbot

Chatbots in artificial intelligence integrate intelligence and machine learning, which allows for the simulation of human communication in the form of dialogue, processing queries such as requests for information, order tracking, and suggestions^[22]. In agricultural e-commerce, Shopee chatbots help answer Generation Z queries about the origin of the produce and its sustainability^[23].

2.2.3. AI-Initiated Pricing

With artificial intelligence pricing, prices are dynamically adjusted in real-time based on competitors, demand, and behaviors to ensure efficiency^[24]. In e-commerce, artificial intelligence pricing can be applied in real-time during promotions. In agriculture, artificial intelligence pricing stabilizes prices of volatile products like fruits to reduce losses for farmers^[11].

2.2.4. AI-Recommendation System

Recommendation systems, which use artificial intelligence and analyze trends of users and peers, can also be employed for suggesting matches based on their history^[17]. These systems have the potential for increasing engagement, conversion, and satisfaction, particularly for Gen Z, who are identified by their ecological awareness and demand for sustainable products^[7].

2.2.5. AI-Image Search

The application of artificial intelligence technology in image search involves image processing using computer vision technology, which enables keywordless search or search using images^[25]. This enables images to be matched with catalogs, thus improving the rate of

discovery and search^[3, 26]. In agriculture, Generation Z can use image search to find new items such as vegetables.

2.3. Customer Experience

Customer experience is the customers' overall cognitive, emotional, and behavioral responses to their interactions with an e-commerce website throughout the entire shopping process. In virtual environments, customer experience is no longer solely dependent on the quality and price of the products, but also on the level of effectiveness of technology in facilitating the interaction between customers and the virtual platforms^[2]. For Generation Z, who are born in the age of digital technology, their customer experience is mainly influenced by speed, convenience, and personalization, rather than traditional aspects of customer service^[5].

Artificial intelligence is one of the key factors in the customer experience in the context of e-commerce. It helps the e-commerce business analyze the data related to the customers, predict the preferences of the customers, and make the customer experience more efficient. This creates a fast, personalized, and efficient customer experience in the context of e-commerce^[2, 3]. In the context of agricultural e-commerce, artificial intelligence is considered one of the key factors in the customer experience, as it helps in reducing information asymmetry, which is considered important in the context of agricultural product purchase decisions, especially for the younger generation who are not aware of the products^[21, 27].

The use of AI technology chatbots is also helpful in improving the customer experience because instant response is provided to the customers regarding their queries, order-related issues, and product information without the intervention of human beings, thus enhancing the efficiency of the service provided^[22, 28]. The use of AI technology in the form of recommendation systems is also helpful in improving the customer experience because the relevant information is provided to the customers regarding the product based on the browsing and purchase history of the customers, thus enhancing the efficiency of the service provided^[9, 17]. The use of AI technology is also helpful in enhancing the overall satisfac-

tion of the customers regarding the product, particularly in the agricultural sector, because the prices of the product are volatile^[24].

Additionally, the use of AI in image search helps in improving the customer experience through the ease of product discovery. This is due to the fact that the technology allows customers to search for products based on images rather than the technical or agricultural terms of the product, thus improving the ease of searching and accuracy, which is beneficial for Generation Z customers^[25].

From the Technology Acceptance Model, customer experience is viewed as the outcome of the user's judgment of the system's usefulness and ease of use. For example, if the AI system makes the shopping process efficient, accurate, and convenient, then the AI system is useful. Moreover, if the AI system is easy to use and needs the least amount of effort, then it is easy to use. Consequently, the customer will experience satisfaction and trust the AI system, and thus continue using the e-commerce platform^[12, 15]. Therefore, customer experience is viewed as the outcome of the interaction between Generation Z and the AI system in the agricultural e-commerce environment facilitated by Shopee.

3. Hypothesis Development and Research Model

In addition, chatbots using AI technology are increasingly playing an important role in enhancing the online shopping experience, especially for the younger generation, including the Millennials and Gen Z. They can simplify online communication by providing fast responses to support customers with their queries, such as order tracking and product recommendations, and meet the demands of speed and accuracy in online shopping^[22]. In addition, owing to the ability of chatbots to analyze data, they are also able to provide personalized responses, which create a sense of care. This is also highly valued by Gen Z, as noted by Venkatesh et al. (2003)^[15]. Chatbots are highly appreciated by Gen Z owing to the fact that they respond quickly and provide satisfaction, as noted by the study conducted by Rita et al. (2026)^[29]. Additionally, the 24/7 availabil-

ity also meets the constant demands of the technology-loving Gen Z. Nevertheless, according to Kikani and Ramchandani (2025)^[30], chatbots also have the limitation of sometimes failing to recognize customer requests, causing customer annoyance. Nevertheless, in the context of Vietnam's e-commerce, where the main customers are Gen Z, including their queries on agriculture^[29], the AI chatbot is still promising to improve the efficiency of customer interaction.

However, previous studies also suggest that the effect of AI chatbots on customer experience may not be entirely favorable. For example, if the chatbots fail to comprehend the requests of the customers, make irrelevant responses, and over-automate the customer service process, this could potentially lead to negative customer experience, lack of trust, and poor perceptions of service quality^[30]. This, therefore, suggests that the relationship between the use of chatbots and customer experience may not be linear. It may, therefore, be possible that the relationship may not be linear, and the moderate and appropriate use of chatbots may have the potential to improve customer experience, but the excessive and inappropriate use may result in negative customer experience. However, owing to the fact that Generation Z has a very high affinity for fast self-service technology-mediated interactions, the use of AI chatbots on Shopee may have a positive impact on customer experience.

H1. *Artificial intelligence-powered chatbots positively influence young users' customer experiences on e-commerce platforms that incorporate agricultural products.*

AI-Initiated Pricing is a new application of AI, in which the price is changed dynamically in response to user behavior and market conditions. This not only enhances the competitiveness of businesses but also provides a sense of price fairness to the customer. If the price is determined by the actual price of the products, then the customers, especially the youth, feel secure and satisfied with the service provided^[31]. However, dynamic and transparent pricing must also be ensured; otherwise, consumers will be suspicious and will lack trust in the business. Therefore, it is essential to maintain transparency and consistency in AI pricing. The research study carried out by Banerjee (2025)^[24] involved 284 young Chinese consumers ranging in age from 21 to

30 years and found that AI pricing not only enhances the efficiency of shopping but also provides a sense of objectivity, as the product is priced according to actual data and not according to human emotions. Therefore, personalization of prices according to actual needs makes consumers feel well-served, thereby enhancing the experience. Since the behavior of consumers and access to technology are similar, AI pricing is expected to bring positive effects for e-commerce in Vietnam. Specifically, AI pricing benefits Generation Z in Vietnam due to fluctuations in agricultural prices^[32].

However, previous research suggested that AI-initiated pricing may have negative or non-linear effects on customer experience. For instance, if prices fluctuate too frequently, are not transparent, or are inconsistent across customers, customers may feel that they are being treated unfairly, manipulated, or discriminated against, which may negatively affect their satisfaction^[24, 31]. In agricultural e-commerce, prices fluctuate frequently due to seasonal factors. Hence, AI-initiated pricing may have a negative effect on customer experience. The relationship between AI pricing and customer experience may take an inverted U-shape. In other words, prices adjusted by AI within an optimal range may have a positive effect on customer experience, while excessive AI pricing may have a negative effect. However, for Generation Z customers in Vietnam, AI pricing on e-commerce platforms like Shopee is expected to be within an optimal range, as customers value efficiency, data-driven objectivity, and real-time responsiveness.

H2. *AI-initiated pricing enhances young consumers' experiences on e-commerce platforms that incorporate agricultural products.*

In the context of e-commerce, the role of AI-based image search technology is increasingly asserting its presence as an effective supporting tool. The system is currently much faster in giving feedback to the search enquiries of the users through the option of uploading images, thereby providing a fast and convenient shopping experience, which is what the new generation of young consumers expect^[25]. While providing the facility of search, AI technology is also capable of providing suggestions related to the product, thereby personalizing the shopping experience, which is also likely to result

in the purchase. The combined facility of convenience and speed makes the shopping experience smoother and more convenient. The study conducted in Malaysia among 208 young users (18 years old) showed that AI technology-based image search has a positive impact on the user experience through its capability to search accurately using images. As the characteristics of the survey group are similar to those of the youth in Vietnam, it is reasonable to conclude that AI-based image search technology is likely to show similar effects in the Vietnamese market as well^[10].

Nevertheless, despite the advantages of AI-based image search, there is also the possibility that it might bring some negative or diminishing effects on the customer experience. For instance, there is the possibility that the visual search system might misrecognize the product, so it recommends the products that might not perform the same functions as the product in the image, or fail to accurately recognize the freshness, sizes, or quality of the product, especially in agricultural products. Additionally, the system might fail to provide the customers with the feeling that they are in control of the search process, as it relies too much on the AI-based visual search suggestions. Therefore, the relationship between AI image search and the customer experience is non-linear, where the benefits of the AI-based image search in the platform will fall within the positive zone, thus having a positive effect on the customer experience in agricultural e-commerce, given the fact that Generation Z favors the use of visual search.

H3. *Artificial intelligence image search positively impacts young customer experiences in e-commerce, which incorporates agricultural products.*

For young and tech-savvy consumers who are used to personalized interactions, AI-based product recommendation systems have a number of practical benefits. For example, by analyzing consumers' behavior in terms of browsing and purchasing history, as well as their personal preferences, AI can provide them with product recommendations, which can save them time searching for a product and make them feel satisfied with the recommendation system^[17]. By being recommended products according to their needs, consumers will feel understood by the system, which can lead to increased loyalty to the

recommendation system. However, if the recommendation is not accurate or there are too many recommendations, the consumer will feel annoyed and lose interest in the system^[16]. A study in Saudi Arabia by Beyari and Garamoun (2022)^[9] with 148 participants, most of whom were 18 years old and above, revealed that the use of AI recommendation systems could increase the satisfaction and loyalty of consumers. However, in the study in Vietnam by Thi Mai Anh and Huong (2019)^[10] with 204 users, it has been pointed out that one of the consequences of the use of the AI recommendation system is that there might be information overload and a lack of trust in the system due to inaccurate recommendations. Even though there are some limitations in the aforementioned studies, the majority of the studies, including Beyari and Garamoun (2022)^[9], have confirmed the positive effect of the AI recommendation system on young consumers. If the AI recommendation system technology is used in the right way, not only will the consumer experience a convenient experience, but the experience itself will also be enhanced, especially in the context of the use of e-commerce platforms that sell agricultural products^[7].

However, the literature suggests that the effect of AI-based recommendation systems on customer experience is not linearly positive. For example, if the number of recommendations provided by the AI system is too many, too repetitive, or too mismatched, then the customer might experience information overload and feelings of manipulation and control. This may eventually lead to low customer satisfaction^[16]. This problem may be more significant in the case of agricultural e-commerce, as the recommendations may not be appropriate from the perspective of the customer's dietary needs or product quality. Therefore, the impact of rec-

ommendation systems on customer experience could be non-linear, with moderate recommendations being more appropriate in order to enhance the customer experience. However, in the case of Generation Z customers who are accustomed to efficiency, personalization, and AI-based recommendations, the impact of AI-based recommendation systems could be linear in nature.

H4. *Artificial intelligence-based recommendation systems positively influence young customers' experiences in e-commerce, which incorporates agricultural products.*

4. Methodology

4.1. Data and Sampling

The sample size of 336 Generation Z consumers was found sufficient to elicit information on the impact of artificial intelligence on experiences. The sample included consumers who were exposed to e-commerce, thus being digitally savvy^[33]. The random sample design gave all the participants equal probability, hence eliminating biases and ensuring a representative sample. It maintained socio-cultural uniformity, although variances in the sample members' exposure to artificial intelligence needed to be analyzed carefully.

4.2. Variables

Artificial intelligence served as the independent variable, impacting Generation Z customer experience, the dependent variable. Artificial intelligence was measured via four components: Recommendation systems (X1), Chatbots (X2), Initiated pricing (X3), and Image search (X4), see **Table 1**.

Table 1. Variable Description.

Factor	Number of Items	Explanation	Source
AI-Recommendation System	4	Assesses alignment of Shopee recommendations with preferences and discovery.	Beyari and Garamoun (2022) ^[9]
AI-Chatbot	4	Measures quick, accurate assistance without human intervention.	Beyari and Garamoun (2022) ^[9]
AI-Initiated Pricing	3	Evaluates fair, competitive pricing consistent with habits.	Beyari and Garamoun (2022) ^[9]

Table 1. Cont.

Factor	Number of Items	Explanation	Source
AI-Image Search	3	Gauges effectiveness in product recognition and interest matching.	Beyari and Garamoun (2022) ^[9]
Customer Experience	4	Assesses artificial intelligence's role in optimizing processes, confidence, and overall experience.	Pires et al. (2025) ^[34]

Source: Author's compilation.

5. Results and Discussion

5.1. Respondent Demographics

Demographics included gender, age, frequency, Shopee tenure, and motivations (Table 2).

Females dominated at 76.4%, indicating potential gender bias in using the platform: women bought agricultural products more often. The ages of the respondents centered on 21 at 58.6%. Longer users, 68.5% with more than two years, showed artificial intelligence familiarity, mainly females. Affordability motivated most at 56.7%, especially youth; diversity appealed to older Generation Z. Service lagged at 10.3%, but artificial intelligence could elevate it.

5.2. Variable Descriptions

Descriptive statistics, including minima, maxima, means, skewness, and kurtosis, outlined distributions (Table 3).

The mean of all variables ranged from 1.96 to 4.31, with Recommendation system and Initiated pricing

above 4.0 indicating agreement, while Chatbot and Image search remained neutral. Negative skewness for the recommendation system and initiated pricing suggested high consensus; positive for chatbot and image search indicated neutrality. Kurtosis showed consistency in the recommendation system and initiated pricing, with dispersion in others^[35].

Reliability and Validity

Cronbach's alpha assessed internal consistency, with values above 0.7 deemed reliable^[35] (Table 4).

All values exceeded 0.7, with no redundancy above 0.95, confirming reliability.

5.3. Exploratory Factor Analysis, KMO, and Bartlett's Test

Exploratory factor analysis clarified latent structures; Kaiser-Meyer-Olkin and Bartlett's tests assessed suitability (Tables 5–7)^[36].

Variables grouped into Recommendation system, Chatbot, Initiated pricing, and Image search with high loadings, validating the structure.

Table 2. Demographic Information.

Characteristic	Category	Percentage (%)
Age	19	13.8
	20	11.8
	21	58.6
	22	15.8
Gender	Male	23.6
	Female	76.4
Shopping Frequency	Daily	47.3
	Weekly	25.1
	Monthly	23.6
	Less than monthly	3.9
Shopee Tenure	More than 2 years	68.5
	1 to 2 years	11.3
	Less than 6 months	9.9
	6 to 12 months	10.3

Table 2. Cont.

Characteristic	Category	Percentage (%)
Motivation	Affordable prices	56.7
	Product diversity	33.0
	Service quality	10.3

Source: Author's calculations using SPSS 27.

Table 3. Descriptive Statistics.

Variable	Minimum	Maximum	Mean	Standard Deviation	Skewness	Standard Error	Kurtosis	Standard Error
RS1	2	5	4.31	0.83	-1.253	0.171	1.23	0.34
RS2	2	5	4.29	0.789	-1.115	0.171	1.071	0.34
RS3	2	5	4.25	0.79	-1.087	0.171	1.114	0.34
RS4	2	5	4.25	0.789	-1.079	0.171	1.116	0.34
CB1	1	5	1.98	0.97	1.356	0.171	2.176	0.34
CB2	1	5	1.96	0.884	1.034	0.171	1.256	0.34
CB3	1	5	2.00	0.931	1.143	0.171	1.626	0.34
CB4	1	5	1.96	0.914	1.19	0.171	1.751	0.34
IP1	1	5	3.58	0.807	-0.41	0.171	0.262	0.34
IP2	1	5	3.60	0.903	-0.778	0.171	1.009	0.34
IP3	1	5	3.57	0.906	-0.457	0.171	0.448	0.34
IS1	1	5	2.87	0.80	0.303	0.171	-0.016	0.34
IS2	1	5	2.88	0.844	0.178	0.171	-0.263	0.34
IS3	1	5	2.87	0.858	0.297	0.171	-0.554	0.34
CE1	1	4	2.73	0.862	0.086	0.171	-0.923	0.34
CE2	1	4	3.05	0.698	-0.956	0.171	1.927	0.34
CE3	2	5	3.73	0.862	0.086	0.171	-0.923	0.34
CE4	2	5	3.73	0.862	0.086	0.171	-0.923	0.34

Note: Standard deviation and standard error are abbreviated in the original.

Source: Author's calculations using SPSS 27.

Table 4. Cronbach's Alpha.

Factor	Alpha	Standardized Alpha	Items
RS	0.866	0.866	4
CB	0.907	0.907	4
IP	0.854	0.854	3
IS	0.834	0.834	3

Source: Author's calculations using SPSS 27.

Table 5. KMO and Bartlett's Test.

Measure	Value
Kaiser-Meyer-Olkin Sampling Adequacy	0.773
Bartlett's Test Significance	Less than 0.001

Note: Kaiser-Meyer-Olkin at 0.773 and significance less than 0.001 confirmed factorability.

Source: Author's calculations using SPSS 27.

Table 6. Total Variance Explained.

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	3.374	24.102	24.102	3.374	24.102	24.102	3.147	22.477	22.477
2	2.881	20.58	44.682	2.881	20.58	44.682	2.861	20.437	42.914
3	2.268	16.201	60.883	2.268	16.201	60.883	2.338	16.698	59.612
4	2.094	14.956	75.839	2.094	14.956	75.839	2.272	16.227	75.839
5	0.507	3.625	79.464						
6	0.440	3.142	82.606						
7	0.386	2.756	85.361						
8	0.358	2.554	87.916						

Table 6. Cont.

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
9	0.350	2.498	90.413						
10	0.337	2.405	92.818						
11	0.306	2.183	95.001						
12	0.259	1.850	96.851						
13	0.221	1.581	98.432						
14	0.220	1.568	100.000						

Table 7. Exploratory Factor Analysis Rotated Component Matrix.

Code	Items	Component			
		CB	RS	IP	IS
RS1	Based on your previous shopping experience, the product recommendations from Shopee align with your personal preference		0.842		
RS2	Based on your previous shopping experience, the product recommendations from Shopee align with your personal preference		0.829		
RS3	Based on your shopping experience, Shopee's recommendation systems significantly help you save time in searching for products		0.842		
RS4	Product suggestions from Shopee are based on your search history to provide suggestions that suit your needs.		0.854		
CB1	Based on your shopping experience, Shopee's AI chatbot provides quick responses to your questions.	0.902			
CB2	In your opinion, the information provided by Shopee's AI chatbot is accurate and useful to your needs.	0.870			
CB3	Based on the shopping experience, Shopee's AI chatbot solves your problems without human intervention.	0.883			
CB4	Your customer service experience has been significantly improved thanks to Shopee's AI chatbot.	0.878			
IP1	In your opinion, the pricing system initiated by AI on Shopee offers competitive deals that suit your shopping behavior.			0.860	
IP2	As a shopper, you trust that Shopee's AI pricing system provides transparent and fair prices.			0.878	
IP3	Based on your shopping experience, Shopee's AI-initiated pricing system enhances your overall satisfaction with shopping.			0.889	
IS1	Based on your shopping experience, Shopee's AI image search feature helps you quickly find similar products you want to buy.				0.846
IS2	In your opinion, Shopee's AI image search feature makes it easier to find a product even if you don't know its name.				0.860
IS3	Your experience with Shopee's AI systems has significantly improved your overall experience.				0.890

5.4. Pearson's Correlation

Pearson correlation analysis was then used to measure the strength and direction of the linear relationship between continuous variables, through the correlation coefficient^[24]. Correlations measured associations^[29] (Table 8).

Initiated pricing to customer experience correlation at 0.507, with p less than 0.01, was the strongest; Image search to customer experience was moderate at

0.394. The recommendation system and Chatbot showed weaker but significant links. Low inter-independent correlations suggest no multicollinearity.

5.5. Regression

To assess the impact and direction of the independent variables on the dependent variable, linear regression was used, and the statistical significance of each predictor variable in the model was tested^[35] (Tables 9–11).

Table 8. Pearson Correlations.

	RS Average	CB Average	IP Average	IS Average	CE Average
RS Average	1				
CB Average	-0.063	1			
IP Average	0.165*	-0.060	1		
IS Average	0.001	0.030	0.015	1	
CE Average	0.232**	0.123*	0.507**	0.394**	1

Note: * p less than 0.05. ** p less than 0.01.

Source: Author's calculations using SPSS 27.

Table 9. Analysis of Variance.

Model	Sum of Squares	Degrees of Freedom	Mean Square	F-Value	Significance
Regression	58.277	4	14.569	40.891	Less than 0.001
Residual	70.546	198	0.356		
Total	128.832	202			

Note: Dependent: Customer experience average. Predictors: Image search average, Recommendation system average, Chatbot average, and Initiated pricing average. Sum of squares, mean square as abbreviated; The model explained 58.277 variance units with F at 40.891 and p less than 0.001.

Source: Author's calculations using SPSS 27.

Table 10. Model Summary.

R	R-Squared	Standard Error of Estimate	Durbin-Watson
0.673	0.452	0.596	1.832

Note: R-squared at 0.452; Durbin-Watson at 1.832 indicated no autocorrelation.
Source: Author's calculations using SPSS 27.

Table 11. Coefficients.

Predictor	Unstandardized Coefficient B	Standard Error	Standardized Coefficient Beta	t-Value	Significance
Constant	-0.812	0.371		2.187	0.030
Recommendation System	0.190	0.063	0.161	3.017	0.003
Chatbot	0.148	0.052	0.151	2.865	0.005
Initiated Pricing	0.503	0.056	0.484	9.066	Less than 0.001
Image Search	0.422	0.058	0.382	7.265	Less than 0.001

Source: Author's calculations using SPSS 27.

All betas were positive and significant; initiated pricing was strongest at 0.484, followed by image search at 0.382.

5.6. Discussion

5.6.1. Hypothesis 1 (Supported)

This hypothesis evaluates the relationship between the recommendation system and customer experience, as shown in **Table 12**. The results confirm that the AI-recommendation system improves customer experience through personalization and efficiency, especially for Generation Z Customers, a young, tech-savvy generation that prioritizes speed and relevance. This result is in line with previous studies, such as Ricci et al. (2015)^[17], who found that the AI-Recommendation system improves the overall customer experience because it analyzes users' past behaviors to provide rel-

evant product suggestions, saving customers' time and increasing the level of interaction between Generation Z customers and e-commerce platforms. The results of the study also reflect similarities with the study of Beyari and Garamoun (2022)^[9]; both studies show that the AI recommendation system improves customer shopping experience and increases loyalty through suggesting results based on behavior. However, this result is contrary to the study of Thi Mai Anh and Huong (2019)^[10], which states that this system will have negative impacts, such as information overload, feeling manipulated and reduced trust, which negatively affects customer experience. This difference comes from the difference between the two demographic groups. While middle-aged people value transparency and are easily overwhelmed by novelty, Generation Z prioritizes speed and accuracy, which makes them satisfied if the system works effectively.

Table 12. Hypothesis Results.

Hypothesis	Relationship	Beta	Significance	Result
1	Recommendation system to customer experience	0.161	0.003	Supported
2	Chatbot to customer experience	0.151	0.005	Supported
3	Initiated pricing to customer experience	0.484	Less than 0.001	Supported
4	Image search to customer experience	0.382	Less than 0.001	Supported

Source: Author's calculations using SPSS 27.

Therefore, for Shopee, where the user group is mainly Generation Z, the AI-recommendation system is an important system in improving customer experience

through personalization and response speed, especially when it comes to daily agricultural products, i.e., organic fruits, herbs, and the like^[7].

5.6.2. Hypothesis 2 (Supported)

This hypothesis examines the relationship between AI-Chatbot and customer experience based on the data presented in **Table 12**, and the results revealed that AI-Chatbot has assisted e-commerce sites in improving customer satisfaction for Generation Z customers based on the fact that it responds instantly, is good at personalization, and is efficient in serving customers. This result is consistent with the finding by Adamopoulou and Mousiadis (2020)^[22] since both studies revealed that AI-Chatbot is essential in improving customer experience since it responds to customer questions instantly, mostly about orders, which is consistent with the needs of Generation Z customers for accuracy and high speed. This result is consistent with the finding by Rita et al. (2026)^[29] since both studies revealed that AI-Chatbot influences Generation Z customer satisfaction since it serves them 24/7 and is good at personalization. However, this result is inconsistent with the finding by Kikani and Ramchandani (2025)^[30] since both studies revealed that AI-Chatbots are not good at understanding customer requests, which makes them disappointed. This is due to the difference in expectations and behaviors between generations. Older customers generally prefer direct interactions, while young people want speed, accepting small errors as long as their experience is continuous, fast and convenient. Therefore, for Shopee, AI-Chatbot is an important tool to serve Generation Z customers because it provides 24/7 support, meeting simple and repetitive needs such as order tracking or personalized product recommendations, including farm queries^[23].

5.6.3. Hypothesis 3 (Supported)

The results of **Table 12** evaluate the relationship between AI-Indicated Pricing and customer experience, which shows that this system helps improve customer satisfaction through personalization, transparency and fairness, making Generation Z customers satisfied because they prioritize efficiency, fairness and speed based on data. This result is similar to the study of Elmaghraby and Keskinocak (2003)^[31] who also stated that an AI-recommendation system can make users more satisfied when balancing personalization and high security, besides also providing competitive prices that match the

product value. This result is also similar to the study of Banerjee (2025)^[24], as they both stated that this system helps personalize the customer experience because they can adjust prices based on behavior and market demand, making users feel more objective and trustworthy. However, this result is different from Elmaghraby and Keskinocak (2003)^[31], who identified the risk of losing trust if the price changes too quickly or a lack of transparency. This reflects the difference between user groups as Generation Z customers often appreciate the modification of the product's value in accordance with its price, while the older group cares about fairness and transparency. Therefore, AI-initiated pricing helps Shopee gain an advantage in meeting the requirements of Generation Z customers because real-time price adjustment is a more transparent and competitive platform, which is vital for agricultural volatility^[11].

5.6.4. Hypothesis 4 (Supported)

The result of this analysis assesses the relationship between AI-Image Search and customer experience according to the statistics shown in **Table 12**. The result shows that AI-Image Search is beneficial in enhancing the customer shopping experience because it facilitates the process of searching for products by Generation Z customers, as reflected in the fast and convenient trend of this group of customers. This result tends to be similar to the study of Guo et al. (2016)^[25] who also found that AI-Image Search helps users overcome all the limitations of keyword searching, allowing customers to upload images quickly and conveniently. This result is also similar to Huang and Rust (2021)^[3], who both said that this technology enhances personalization by recommending products with similar images, making the shopping experience more efficient, closer to personal preferences, increasing satisfaction and loyalty. This technology also reduces the need for exact keywords, eliminating a common barrier to online shopping and increasing customer satisfaction. Through this result, it can be concluded that AI-Image Search is an effective solution when serving the Generation Z Customer group because it meets the requirements of speed and convenience, especially when Generation Z nowadays are not very familiar with agricultural colloquiums^[37].

5.7. Key Findings

The study found that AI technologies are playing a key role in enhancing the online shopping experience of young consumers. On one hand, the AI image search tools minimize the search time required to find a product and allow users to access their desired product with ease, which can be considered a significant advantage to young and tech-savvy consumers. On the other hand, AI chatbots provide a sense of convenience due to their quick response and timely support. However, their inability to answer complex questions may cause dissatisfaction among users. Another impact of AI-based pricing is related to young consumers' perceptions, as fairness in pricing is considered a significant factor in building trust among them. Furthermore, AI technology in creating personalized recommendations for agricultural products helps in building customer experience; however, when such recommendations are not relevant and come up frequently, it can work against the brand. These factors can be applied in the agriculture sector to promote sustainable trade^[21].

6. Conclusions

These results confirm the significance of artificial intelligence in enhancing Generation Z experiences on Shopee, with Initiated pricing at beta 0.484 and Image search at beta 0.382 being the most significant. These results support the hypotheses and highlight the significance of artificial intelligence in global agricultural economics towards sustainable farm trade. In Vietnam, agriculture makes 14% of GDP (Shopee at 20% of online farm sales in 2024), and artificial intelligence helps Generation Z access quality products, reducing wastage and increasing agricultural exports towards the United Nations Sustainable Development Goal 2^[18].

From the research findings, recommendations:

- (1) Enhance the AI Image Search feature with Augmented Reality (AR) and Virtual Reality (VR) technology. This helps users visualize agricultural products better, such as virtual try-on or previewing products in real farms and factories. Shopee should incorporate AR/VR technology units to de-

velop mobile-compatible tools, and deploy testing across farm products' categories.

- (2) Improve the AI-Chatbot system through a hybrid support model (Hybrid Support), combining advanced NLP and transferring to real agriculture-specialized staff when needed. This will enable the chatbot to better understand the context and provide more precise answers, ensuring the satisfaction of the users, especially in the context of agriculture.
- (3) Utilize the "Price Insights" feature to enhance the transparency of the AI-based pricing process. Shopee can create a feature that explains the determinants of price, like the demand in the agriculture market, to enhance the trust and sense of justice among young people.
- (4) Develop the Smart Personalization Dashboard to enable customers to personalize the suggestions related to agricultural products according to their personal preferences and category priorities. Personalized dashboards related to sustainable agriculture align with the values of Shopee^[23].

The scope and methods of the research should also be included in future research. This includes the simplicity and effectiveness of the survey tool. The sources should also be credible in order to develop a strong theory base. Moreover, quantitative and qualitative methods should also be used for the research. This will give further insight into the research topic. The sample size should also be expanded to other industries. The use of AI, behavioral data, and sentiment analysis will open avenues for further research. Shopee and Alibaba platforms should also be used for further research, which will open avenues for policy implications^[38].

Author Contributions

Conceptualization, H.T.T.H., H.T.T.D. and A.P.; methodology, H.T.T.D. and A.P.; investigation, A.P.; resources, A.P.; data curation, A.P.; writing—original draft preparation, H.T.T.H., H.T.T.D. and A.P.; writing—review and editing, H.T.T.H. and H.T.T.D.; visualization, H.T.T.H.; supervision, H.T.T.H.; funding acquisition, H.T.T.H. All authors have read and agreed to the published version of

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Informed Consent Statement

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Data Availability Statement

The data that support the findings of this study are available from the corresponding author upon reasonable request.

Conflicts of Interest

The authors declare that there is no conflict of interest.

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