



Influencing Mechanism of Guizhou Consumer Satisfaction on Rural E-Commerce Logistic Model in Agricultural Products

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Abstract: *The rapid advancement of technology has fundamentally transformed our daily lives, particularly in the internet and databases. In the agricultural sector, integrating e-commerce platforms in rural areas has ushered in a new era of opportunity for farmers and producers. By leveraging efficient logistics systems, these platforms have enabled them to tap into broader markets. Furthermore, they have proven instrumental in enhancing rural farmers' growth, efficiency, and market access. As rural areas undergo revitalization, e-commerce platforms play a pivotal role in the development of agriculture. Their impact is far-reaching, fostering diversification, adopting intelligent agricultural practices, and establishing e-commerce trading and delivery platforms. The number of respondents for this study was 390, with its focus on the intricacies of the e-commerce development strategy for consumer satisfaction in rural areas is of utmost importance. It aims to spotlight the logistics model and specific development strategies that will further the advancement of e-commerce in rural regions, all within the broader context of rural revitalization.*

Keywords: *Consumer Satisfaction, Rural E-Commerce Logistic Model, Agricultural Products*

1. INTRODUCTION

Over the past few decades, China has achieved remarkable agricultural development and reform progress by implementing innovative rural institutions, advanced agricultural technology, market reforms, and increased agricultural input. The role of agricultural logistics, which is integral to the modernization of agriculture, is intricately linked to the well-being of farmers (Hu & Hu., 2023). The objective is to employ state-of-the-art logistical methods to enhance the value of agricultural activities and products, reduce production and distribution costs, improve market responsiveness, enhance the quality of agricultural product delivery, and elevate customer satisfaction levels (Guo et al., 2018). These efforts ultimately enhance the overall efficiency of the agricultural supply chain and effectively address issues concerning "agriculture, rural areas, and farmers." Supported by policies aimed at the agricultural industry chain and driven by the growing demand for agricultural products, the volume of agricultural product logistics has experienced consistent growth. The agricultural logistics market has witnessed a surge in growth opportunities, particularly with the advent of "Internet + agriculture" and e-commerce platforms, with its value reaching several trillion yuan (He, 2021). Additionally, the No. 1 document of the Chinese Central Committee in 2023 emphasized the need to expedite the enhancement of e-commerce and logistics distribution systems in counties and villages. It proposed various strategies to accelerate agricultural economic growth by

improving its logistics, including the development of regional agricultural logistics aligned with new rural planning, the establishment of diverse agricultural logistics systems, the promotion of characteristic agricultural logistics, and the expansion of the circulation of agricultural products (Su et al., 2020).

Problem Objectives

The research models will be based on three vital theories of the Technology Acceptance Model (TAM), the Theory of Planned Behavior (TPB), and the Innovation Diffusion Theory (IDT) for this study to explain the relationship between consumer satisfaction and the use of rural e-commerce logistic model in agriculture products in Guizhou. This study investigates the factors that influence the consumer satisfaction of Guizhou consumers on the rural e-commerce logistic model in agricultural products. The study has two main objectives:

1. To explore how perceived functionality, perceived service quality, and perceived value impact consumer satisfaction on the rural e-commerce logistic model in agricultural products.
2. To further understand the mechanisms underlying customer usage behavior and formulate feasible strategies to contribute to the sustainable development of the e-commerce logistic model in agricultural products.

Therefore, this study will examine the impact of three key independent variables, perceived functionality, perceived service quality, and perceived value, on the dependent variable of students' consumer satisfaction.

2. THEORETICAL FOUNDATION

Definition of The Technology Acceptance Model (TAM)

The Technology Acceptance Model (TAM) is a commonly used theoretical framework that provides insights into user behavior and their inclination toward embracing new technologies (Wu et al., 2012). It is especially relevant in various industries, including information technology, which sheds light on users' willingness to engage in online learning and shopping activities. TAM draws from the theory of reasoned action and delves into computer usage behavior, primarily focusing on users' perceptions of functionality, quality, and value and how these influence the acceptance of technology based on their attitudes and intention to use (Nguyen et al., 2021). Moreover, TAM highlights the importance of website functionalities, particularly in e-commerce settings, and emphasizes their role in user acceptance. The model holds significant implications for applying technology from theoretical

and conceptual perspectives. Therefore, factors such as perceived functionalities, service quality, and risk within the TAM model play a critical role in understanding how comprehensive models for rural e-commerce can effectively implement logistics platforms to enhance overall consumer satisfaction (Schillewaert et al., 2005).

Definition of Theory of Planned Behavior (TPB)

Fishbein & Ajzen., (1977) developed the theory of planned behavior to expand the rational behavior theory. The theory suggests that human behavior is influenced by factors beyond voluntary control, introducing the concept of perceived behavioral control as a new variable. According to this theory, individual behavior is influenced by willingness, which is determined by three key variables: attitudes, subjective norms, and behavioral control. Ajzen further explained these variables as the strength of behavioral beliefs, assessment of behavioral outcomes, normative beliefs, motivation to conform, control beliefs, and perceived strength. The theory of planned behavior finds applications in studies on pro-environmental behavior, food behavior, entrepreneurial behavior, and public behavior in agricultural product usage. This theory has produced valuable experimental results, enhancing our understanding of behavioral motivation in these specific areas (Wallace & Buil., 2023)

Definition of Innovation Diffusion Theory (IDT)

Rogers' Innovation Diffusion Theory (IDT) posited that five critical perceptions influence the decision to adopt an innovation: 1) relative advantage, 2) compatibility, 3) complexity, 4) trialability, and 5) observability. The type of innovation decision plays a crucial role in the adoption process. When the decision-making unit is independent, the process tends to be more straightforward and less time-consuming than when it involves multiple individuals. According to Rogers (2003), four basic types of innovation decisions can be identified: 1) optional, 2) collective, 3) authority, and 4) contingent. Time also plays a significant role in categorizing social system members based on their adoption of an innovation. Rogers developed five adopter categories: 1) innovators, 2) early adopters, 3) early majority, 4) late majority, and 5) laggards. It was found that early adopters differ from later adopters in several ways. For example, an individual who utilizes mass media channels and possesses a vast interpersonal network will likely be an innovator. It can decide earlier to adopt an innovation without relying heavily on input from others in its system (Haryanti & Subridadi., 2020).

Definition of Terms

1. Consumer satisfaction - Satisfied online customers play a vital role in the success of a business. They are not only expected to make repeat purchases themselves but also to recommend the online retailer to others. Customer satisfaction is strongly tied to their attitudes and intentions, impacting their behavior and positive actions towards the brand (Pereira et al., 2016). Future purchasing behavior hinges greatly on online customer satisfaction, as happy customers increase their usage level and show long-term loyalty to the service provider (Rita et al., 2019). To boost customer confidence and loyalty, online shopping systems allow customers to personalize the screening, pre-purchase, and search process while reducing future purchase costs. Many studies have found a significant correlation between online service quality and customer satisfaction in logistic systems.
2. Perceived functionality - Brand trust in functionality refers to a psychological state in which one party relies on the reliability and integrity of another. According to Lin et al. (2016), this trust is established when a consumer believes in a brand's ability to deliver on its promised function. In marketing literature, brand trust is often viewed through two dimensions. The first dimension, reliability, encompasses the technical and competency-based nature of the brand's capacity and willingness to fulfill promises and satisfy consumer needs. The second dimension, intentions, involves attributing positive intentions to the brand regarding consumer well-being, interests, and welfare (Huang, 2015).
3. Perceived service quality - The researcher examined whether the traditional components of distribution service quality, commonly used in business-to-business (B2B) research, are applicable in the business-to-customer (B2C) space, considering the rise of online retail. Distribution service quality has been extensively studied in online research. For instance, Heim & Sinha., (2001) conducted an empirical study on the eB2C activities of agricultural product retailers, focusing on order buying, order fulfillment, and customer loyalty practices from the consumer's viewpoint. In a different approach, Rabinovich & Bailey., (2004) utilized economic and search cost theories to evaluate the accessibility, timeliness, and dependability of online channels' physical distribution service quality.
4. Perceived value - Customer perceived value can be calculated in two ways: desired or perceived value. The desired value refers to the customer's expectations before using the product or service, while perceived value considers the cost. One method of measuring perceived value is the equation: $\text{Perceived value} = \frac{\text{Tangible benefits}}{\text{Costs paid}}$. Actual value is determined after the product is purchased and used. If the actual value exceeds the perceived value, the customer's perceived value is very high (Han & Xie., 2019). On the

other hand, if the actual value is lower than the perceived value (resulting in low customer value), it can lead to buyer's remorse, and the customer may be unlikely to make a repeat purchase. Customer perceived value is a crucial metric for enhancing service in e-logistics and ensuring customer satisfaction in emerging market offerings (Kim et al., 2019).

Conceptual Framework

In the context of online sales, it has been noted that despite customers expressing satisfaction with the functionality of products, their loyalty to a specific online retailer may not be guaranteed. Extensive research has elucidated a noteworthy connection between customer satisfaction and loyalty, particularly emphasizing the crucial role of improved delivery time, service availability, and information quality within e-logistic systems (Bouzaabia et al., 2013). The way customers perceive the quality of service is intricately intertwined with the process of delivering that service, which is deeply connected to the interactions between customers and salespeople (Vasic et al., 2021). Consequently, the quality of customer care is pivotal in shaping the relationship between the seller and the buyer. According to this theoretical framework, customers are particularly interested in whether the seller demonstrates understanding and empathy and takes an active role in helping them resolve their issues, making them feel understood and cared for. Based on the study of Parasuraman et al., (2005), the study establishes that within logistics service performance, consumer care and costs are recognized as separate and distinct from operational and relational components. Furthermore, the research reveals a significant correlation between perceived value caused by consumers and their satisfaction in the context of e-logistic platforms.

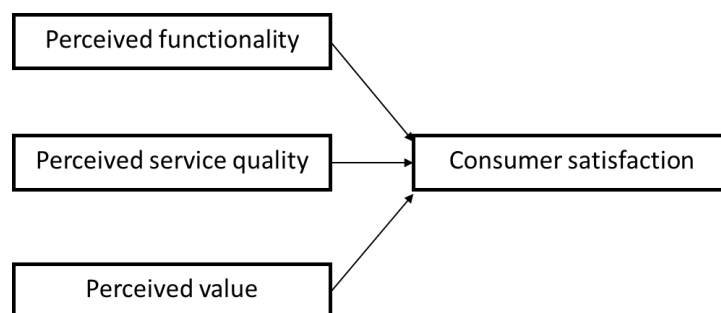


Figure 1. The Conceptual Framework

3. RESEARCH HYPOTHESIS

The Impact of Perceived Functionality on Consumer Satisfaction

Krishnamurthy (2001) posited that active online shoppers often tend to develop a strong sense of trust in specific brands. Various factors, such as delivery time, service quality, and the reliability of information, influence brand trust. On the other hand, individuals who are disinterested in online shopping are more likely to cease using online platforms due to functional issues rather than cost-related concerns, particularly when needing dependable services. Ha & Perks., (2005) also suggested that consumers are more likely to remember their most recent experiences (the recency effect). This means that a positive recent experience can significantly alter their perception of multiple previous negative experiences, which is crucial for building brand trust.

H1 Perceived functionality does not significantly impact consumer satisfaction with agricultural products' rural e-commerce logistic model.

The Impact of Perceived Service Quality on Consumer Satisfaction

Customer satisfaction can be described as the positive emotional response customers experience when comparing their actual consumption experiences with their expectations. As Shukla (2004) outlined, this psychological evaluation is closely tied to the perceived quality of the services received. It involves customers making a mental assessment, comparing the value they receive from a product or service with the sacrifices made in terms of cost and quality, from the moment of purchase to the end of the product's life cycle or the end of use.

H2 Perceived service quality does not significantly impact consumer satisfaction with agricultural products' rural e-commerce logistic model.

The Impact of Perceived Value on Consumer Satisfaction

Every company must emphasize factors such as customer retention and enhancing Perceived Value. Perceived Value holds immense importance in fostering customer loyalty as it reflects customer satisfaction with the service and the extent to which their needs are being addressed. Perceived Value plays a pivotal role in attaining a sustainable competitive advantage in marketing as it measures a company's efficacy in providing value to its customers (Tankovic & Benazic, 2018).

H3 Perceived value does not significantly impact consumer satisfaction with agricultural products' rural e-commerce logistic model.

4. RESEARCH METHODS

Population and Sample

For this research study, 390 Guizhou consumers were collected in June 2024 through the WeChat Survey Platform. The study aimed to analyze the consumers' satisfaction with a rural e-commerce logistic model that could help improve their consumption of agricultural products.

This study's minimum research sample size is based on the following formula for the standard deviation of 0.5, which is widely accepted for analysis (Etikan & Babatope., 2019).

- The margin of error (confidence interval) – 95%
- Standard deviation 0.5
- 95% - Z Score = 1.96
- Sample size formula = $(Z\text{-score})^2 * Std\ Dev*(1-StdDev) / (\text{margin of error})^2$
- $(1.96)^2 * 0.5(0.5) / (0.05)^2$
- $(3.8416 * 0.25) / 0.0025$
- $0.9604 / 0.0025 = 385$
- 385 respondents would be needed for this study based on a confidence level of 95% from the calculation.

Research Model

Correlation Analysis

Correlation analysis is commonly used to study the relationship between two variables. The Pearson correlation coefficient assesses the strength of this relationship. The correlation coefficient (r) value shows the strength of the relationship, while the P-value indicates the significance level of the correlation.

Table 1. Correlation Coefficient Classification

Correlation coefficient r	Degree of relevance
$ r = 1$	Absolute Correlated
$0.70 \leq r < 0.99$	Highly correlated
$0.40 \leq r < 0.69$	Moderately correlated
$0.10 \leq r < 0.39$	Low correlation
$ r < 0.10$	Weak or unrelated

Correlation Analysis of Perceived Functionality and Consumer Satisfaction

The correlation coefficient r between perceived functionality and consumer satisfaction is 0.668, and $P=0.002$ is less than 0.01. Thus, they show a significant relationship.

Table 2. Correlation analysis results between perceived functionality and consumer satisfaction

	Perceived functionality
Consumer satisfaction Sig. (1-tailed)	1
Perceived functionality Sig. (2-tailed)	.668** (.002)

Correlation Analysis of Perceived Service Quality and Consumer Satisfaction

Table 3. Correlation analysis results between perceived service quality and consumer satisfaction

The correlation coefficient r between perceived service quality and consumer satisfaction is 0.639, and $P=0.022$ is less than 0.05. Thus, they show a significant relationship.

	Perceived service quality
Purchase intention Sig. (1-tailed)	1
Perceived service quality Sig. (2-tailed)	.639* (.022)

Correlation Analysis of Perceived Value and Consumer Satisfaction

The correlation coefficient r between perceived value and consumer satisfaction is 0.772, and $P=0.018$ is less than 0.05. Thus, they show a significant relationship.

Table 4. Correlation analysis results between perceived value and consumer satisfaction

	Perceived value
Purchase intention Sig. (1-tailed)	1
Perceived value Sig. (2-tailed)	.772* (.018)

Regression Analysis

Regression analysis is a statistical method used to analyze the relationship between multiple independent variables of a hypothesis and a set of dependent variables. It also helps to assess the strength of relationships between variables and model future relationships between them. In this study, SPSS 26.0 was used to conduct tests on correlation and determination coefficients, perform multiple linear regression, and test the study's hypotheses.

Regression analysis of various variables on consumer satisfaction

The model summary shows that $R=0.922$, $R^2=0.941$, and the adjusted R^2 is 0.946. This means the model can account for 94.6% of the relationship between performance expectation, effort expectation, social impact, and purchase intention. Additionally, the Durbin-Watson test result is 1.998, close to 2, indicating that the residuals are independent and the model has no serial correlation problems.

Table 5. Summary of the regression analysis model of constructs and consumer satisfaction

Model	R	R ²	Adjust R Square	Standard estimate error	Durbin-Watson
1	0.922a	0.941	0.946	0.92351	1.998

The analysis shows significant differences between the independent and dependent variables. The regression sum of squares is 3411.312, and the residual sum is 441.233, with a significance of 0.000, which is lower than the significance level of 0.01. This indicates a substantial effect in the study between perceived functionality, perceived service quality, perceived value, and consumer satisfaction.

Table 6. ANOVAa

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	3411.312	3	422.345	5211.785**	0.000 ^c
	Residual	441.233	386	.552		
	Total	3852.545d	389			

** $p \leq .01$

- Dependent variable: Consumer satisfaction
- Predictor variables: Perceived functionality, perceived service quality, and perceived value

Table 7. Multiple Linear Regression Analysis Test

Model	Unstandardized coefficient		Standardization factor	t	Sig
	B	Standard error			
1 (Constant)	2.558	1.588		4.221	.023
Perceived functionality	.228*	.066	.287	2.356	.019
Perceived service quality	.334*	.059	.387	4.235	.026
Perceived value	.503*	.073	.523	2.884	.015

* $p \leq .05$

- Dependent variable: Consumer satisfaction
- Predictor variable: Perceived functionality, perceived service quality, and perceived value

The regression equation of the multiple linear regression analysis

$$Y = \alpha + \beta X_1 + \beta X_2 + \beta X_3 + e$$

$$Y = 2.558 + 0.228x_1 + 0.334x_2 + 0.503x_3$$

Description:

Y = Consumer satisfaction

α = Constant

X1 = Perceived functionality

X2 = Perceived service quality

X3 = Perceived value

e = Error

β_1 = First Regression Coefficient Number

β_2 = Second Regression Coefficient Number

β_3 = Third Regression Coefficient Number

After adding constants to the inequality, the coefficient table shows perceived functionality, perceived service quality, perceived value, and consumer satisfaction. It can be inferred that there is a significant relationship between these levels.

Interpretation of Research Results

This research seeks to create a robust measurement tool for assessing the quality of e-logistics services. This multifaceted scale will encompass crucial aspects, including delivery timeliness, service availability, information accuracy, product quality and condition, reverse logistics capabilities, customer support efficacy, shipping cost-effectiveness, and payment method convenience. Understanding the significance of these factors is instrumental in shaping customer satisfaction and fostering loyalty in the Guizhou region.

The Effect of Perceived Functionality and Consumer Satisfaction

The test results of the first hypothesis indicate that the level of perceived functionality significantly impacts the consumer satisfaction of rural e-commerce logistics in agricultural products. This is based on the standard regression coefficient of the perceived functionality level, 0.228, $t=2.356$, and a significance level of $0.019 < 0.05$, which shows the significance of impact.

H1 Perceived functionality significantly impacts consumer satisfaction with agricultural products' rural e-commerce logistic model.

The Effect of Perceived Service Quality and Consumer Satisfaction

The test results for the second hypothesis indicate that the perceived service quality significantly impacts consumer satisfaction with rural e-commerce logistics in agricultural products. This is based on the standard regression coefficient of the perceived service quality, 0.334, and a t-value of 4.235. The significance level of $0.026 < 0.05$ shows the impact's significance.

H2 Perceived service quality significantly impacts consumer satisfaction with agricultural products' rural e-commerce logistic model.

The Effect of Perceived Value and Consumer Satisfaction

The result of testing the third hypothesis indicates that perceived value significantly impacts consumer satisfaction with rural e-commerce logistics in agricultural products based on the standard regression coefficient of personal level is 0.503, $t=2.884$, and the significance level is $0.015 < 0.05$, which shows the significance of impact.

H3 Perceived value significantly impacts consumer satisfaction with agricultural products' rural e-commerce logistic model.

5. CONCLUSIONS

Managerial Implications:

This study indicates that to promote the high-quality development of rural e-commerce, the following aspects should be considered:

1. Promoting the popularization of new infrastructure in rural areas and accelerating the coverage of digital infrastructure construction to improve delivery time, service availability, and information quality.
2. Guiding the normalization of rural digital e-commerce and strengthening the construction of farmers' operational thinking, rural digital-market brand cultivation for product quality and condition, and reverse logistics.
3. Promoting the modernization of the rural digital governance system and mechanism to improve consumer care services and to maintain the excellent value of logistic costs.

REFERENCE

- Bouzaabia, R., Bouzaabia, O., & Capatina, A. (2013). Retail logistics service quality: A cross-cultural survey on customer perceptions. *International Journal of Retail & Distribution Management*, 41(7), 627–647.
- Chaudhuri, A., & Holbrook, M. B. (2001). The chain of effects from brand trust and brand affect to brand performance: The role of brand loyalty. *Journal of Marketing*, 65(2), 81–93.
- Etikan, I., & Babatope, O. (2019). A basic approach in sampling methodology and sample size calculation. *Medtext Publications*, 1(1), 50-54.
- Fishbein, M., & Ajzen, I. (1977). Belief, attitude, intention, and behavior: An introduction to theory and research. *Philosophy & Rhetoric*, 41(2), 842–844.
- Gao, Y. Q., Chang, D. F., Fang, T., & Luo, T. (2018). The correlation between logistics industry and other industries: An evaluation of the empirical evidence from China. *The Asian Journal of Shipping and Logistics*, 34(1), 27–32.
- Ha, H. Y., & Perks, H. (2005). Effects of consumer perceptions of brand experience on the web: Brand familiarity, satisfaction, and trust. *Journal of Consumer Behavior*, 4(6), 438–452.
- Han, Y., & Xie, G. (2019). Determinants of customer perceived online shopping logistics service quality value: An empirical study from China. *International Journal of Logistics Research and Applications*, 22(6), 614-637.
- Haryanti, T., & Subridadi, A. (2020). Factors and theories for e-commerce adoption: A literature review. *Marketing Issue for E-Commerce*, 11(2), 10-22.
- He, C. X. (2021). Study on the impact of the evolution of the world food trade network on China's food security. *Journal of Jiangxi University of Finance and Economics*, 11(1), 11-21.
- Heim, G. R., & Sinha, K. K. (2001). Operational drivers of customer loyalty in electronic retailing: An empirical analysis of electronic food retailers. *Manufacturing & Service Operations Management*, 3(3), 264–271.
- Hu, C., & Hu, X. (2023). An analysis of China's agricultural economic growth model from the perspective of production factors: An international comparison of panel data from 75 countries. *Journal of China Agricultural University*, 28(4), 238–247.
- Huang, L. (2015). Quality or responsibility? The impact of two categories of corporate social responsibility on the consumer-brand relationship. *Marketing Management Journal*, 25(1), 27–41.
- Kim, H., Kim, K., & Shin, J. (2019). The relationship between e-perceived value, e-relationship quality, and e-loyalty. *Journal of Theoretical and Applied Information Technology*, 97(1), 4811-4823.
- Krishnamurthy, S. (2001). A comprehensive analysis of permission marketing. *Journal of Computer-Mediated Communication*, 6(2), 4–6.

- Lin, Y., Luo, J., Cai, S., Ma, S., & Rong, K. (2016). Exploring the service quality in the e-commerce context: A triadic view. *Industrial Management & Data Systems*, 116(3), 388–415.
- Nguyen, T. K. C., Cao, K. D., & Le, T. P. (2021). The impact of organizational factors on E-CRM success implementation. *VINE Journal of Information and Knowledge Management Systems*, 12(1), 33-42.
- Parasuraman, A., Zeithaml, V. A., & Malhotra, A. (2005). ES-QUAL: A multiple-item scale for assessing electronic service quality. *Journal of Service Research*, 7(3), 213–233.
- Pereira, H. G., Salgueiro, M. F., & Rita, P. (2016). Online purchase determinants of loyalty: The mediating effect of satisfaction in tourism. *Journal of Retailing and Consumer Services*, 30(1), 279-291.
- Rabinovich, E., & Bailey, J. P. (2004). Physical distribution service quality in internet retailing: Service pricing, transaction attributes, and firm attributes. *Journal of Operations Management*, 21(6), 651-672.
- Rita, P., Oliveira, T., & Farisa, A. (2019). The impact of e-service quality and customer satisfaction on customer behavior in online shopping. *Heliyon*, 5(3), e02690.
- Rogers, E. (2003). *Diffusion of innovations* (5th ed.). New York: The Free Press.
- Schillewaert, N., Ahearne, M. J., Frambach, R. T., & Moenaert, R. K. (2005). The adoption of information technology in the sales force. *Industrial Marketing Management*, 34(4), 323-336.
- Shukla, P. (2004). Effect of product usage, satisfaction, and involvement on brand switching behavior. *Asia Pacific Journal of Marketing and Logistics*, 16(4), 82-104.
- Su, L., Peng, Y., Kong, R., & Chen, Q. (2021). Impact of e-commerce adoption on farmers' participation in the digital financial market: Evidence from rural China. *Journal of Theoretical and Applied Electronic Commerce Research*, 16(1), 1434–1457.
- Tankovic, A. C., & Benazic, D. (2018). The perception of e-servicescape and its influence on perceived e-shopping value and customer loyalty. *Online Information Review*, 42(7), 1124–1145.
- Vasić, N., Kilibarda, M., Andrejić, M., & Jović, S. (2021). Satisfaction is a function of users of logistics services in e-commerce. *Technology Analysis & Strategic Management*, 33(8), 813–828.
- Wallace, E., & Buil, I. (2023). Antecedents and consequences of conspicuous green behavior on social media: Incorporating the virtual self-identity into the theory of planned behavior. *Journal of Business Research*, 157(1), 113-149.
- Wu, H. C., Lindell, M. K., & Prater, C. S. (2012). Logistics of hurricane evacuation in Hurricanes Katrina and Rita. *Transportation Research Part F: Traffic Psychology and Behaviour*, 15(4), 445-461.