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E-COMMERCE IN THE DIGITAL AGE: EMPIRICAL EVIDENCE FROM SERBIA

Sanela Arsić*

University of Belgrade, Technical Faculty in Bor, Serbia

Abstract: Electronic commerce or e-commerce has become integral to the contemporary business landscape. Organizations widely adopt e-commerce technologies to enhance efficiency and gain a competitive edge. As one of the crucial driver of economic growth, adopting e-commerce is essential for developing countries to promote their prosperity and contribute to sustainable economic development. The factors influencing e-commerce are diverse, and understanding them is vital for businesses aiming to thrive in this competitive digital landscape. Therefore, this study aims to identify the factors that impact consumers' online repurchase intentions. Employing quantitative methods, including partial least squares-structural equation modeling (PLS-SEM) and fuzzy set qualitative comparative analysis (fsQCA), the research analyses survey data from Serbia. This study contributes to the literature by offering new insights into the relationship among the predictors of online shopping behaviour and advancing the theoretical ground of how site quality, customer satisfaction, trust and commitment combine to explain high repurchase intentions better. The findings provide deeper insights into priority areas for strategic improvements in adopting e-commerce services and pave the way for future research.

Keywords: E-commerce, repurchase intention, consumers, PLS-SEM, fsQCA

1. INTRODUCTION

The widespread adoption of e-commerce worldwide has reshaped traditional commercial practices and emphasized the essential role of digital marketplaces in contemporary economies (Turban et al., 2015). The digital age has ushered in a remarkable surge in technological advancement, transforming how businesses conduct transactions and how consumers engage in shopping (Sharma, 2023). Recently, the increase in interest in online shopping has been significantly influenced by the COVID-19 pandemic.

E-commerce was significantly reshaping the global economy. By dismantling geographical barriers, e-commerce facilitates seamless cross-border transactions, fostering an inclusive and interconnected marketplace that is accessible to businesses and consumers

* Corresponding author: saarsic@fbor.bg.ac.rs

Sanela Arsić, ORCID: 0000-0002-1957-566X

worldwide (Jauhar et al., 2024). This digital transformation has enabled small and medium-sized enterprises (SMEs) and individual entrepreneurs to engage in global trade without the financial burden of maintaining a physical store (Mahesh et al., 2022). Furthermore, e-commerce has enhanced accessibility in commerce by equalizing opportunities, allowing smaller businesses to compete with larger firms through innovative digital strategies. This change improved market access and supported economic growth, innovation, and diversification, establishing e-commerce as a key element of contemporary commerce (Mahesh et al., 2022).

This shift has not only transformed how businesses operate but has also significantly altered consumer behaviour (Kim et al., 2012; Raji et al., 2024). The rapid expansion of e-commerce was also reflected in consumer behavior in Serbia, as preferences shifted from traditional retail to the dynamic realm of online shopping. Etha et al. (2024) suggest that for an online store to profit from a customer, their spending must be four times the cost of their first purchase. Therefore, it is essential for e-commerce companies to understand the factors that encourage customers to participate in repeat online shopping. This research aims to identify the factors that influence consumers' propensity to shop online again or their intention to repurchase online, employing a quantitative methodology that includes partial least squares-structural equation modeling (PLS-SEM) and fuzzy set qualitative comparative analysis (fsQCA). PLS-SEM methodology was used to assess the direct and indirect effects of various factors influencing consumers' online repurchase intentions, providing insights into their significance and predictive power. On the other hand, fsQCA was employed to identify different combinations of conditions (factors) that lead to the same outcome. Unlike conventional regression-based methods that assume linear relationships, fsQCA recognizes that multiple pathways can lead to the same consumer behavior. By integrating PLS-SEM and fsQCA, this study provides a comprehensive analysis, leveraging the strengths of both methods. This combined approach ensures robust and insightful findings, contributing to both theoretical advancements and practical implications in the field of e-commerce and consumer behavior. Understanding the factors that drive online repurchase intentions is crucial for e-commerce businesses aiming to achieve sustainable growth and maintain a competitive edge. Repurchase intention serves as a vital determinant of e-commerce success, reflecting customer loyalty and the overall health of an online business.

2. THEORETICAL BACKGROUND AND RESEARCH HYPOTHESES

E-commerce has experienced exponential growth over the past two decades, driven by advancements in internet technology, increased accessibility to online platforms, and evolving consumer preferences (Chen et al., 2020). Initially, concerns regarding security and trust hindered widespread adoption, but as technology progressed and security measures improved, consumers became more comfortable engaging in online transactions. The COVID-19 pandemic further accelerated e-commerce growth, as lockdowns and social distancing measures compelled consumers to rely on online channels for essential goods and services. This surge in online activity has created both opportunities and challenges for businesses (Paștiu et al., 2020). While e-commerce offers access to a global customer base, it also intensifies competition and necessitates a profound understanding of consumer behavior to thrive in this environment. The growing number of internet users in countries like Serbia presents an opportunity for businesses to expand through e-commerce. This growth is supported by the increasing number of internet users and the government's initiatives to develop the digital economy. The percentage of individuals in Serbia using the Internet to purchase goods or services exhibited a consistent upward trend, increasing from 38.38% in 2020 to 59.69% in 2024 (Source of data: Eurostat,

2025). This represents a significant growth of 21.31 percentage points over four years, reflecting the country's rapid digital transformation of consumer behaviour. In Serbia, the e-commerce market is projected to experience a Compound Annual Growth Rate (CAGR, 2024) of 22.3% by 2027. Compared to other Balkan countries, Serbia stands out as the most developed in terms of e-commerce adoption. This trend shows a significant and ongoing rise, influenced by multiple factors such as enhanced internet infrastructure, broader access to e-commerce platforms, increased consumer confidence in online purchases, and the rapid digital transformation of businesses. Additionally, the younger, tech-savvy population and rising disposable incomes have further stimulated the shift toward digital consumption (Ljubicic & Štokić, 2024). As a result, Serbia is positioning itself as a regional leader in online shopping, with the potential for continued expansion in the coming years.

Online repurchase intention is a complex construct influenced by numerous factors. In recent years, an increasing number of researchers have examined this issue, including Mosavi and Ghaedi (2012), Shin et al., (2013), Keiningham et al. (2015), Sullivan and Kim (2018), Mbango (2018), Aslam et al. (2018), Chen et al. (2020), and Etha et al. (2024). Building on this growing body of research, the present study explores the roles of site quality, customer satisfaction, trust, and commitment, seeking to assess their distinct effects on consumer repurchase behavior and provide a more comprehensive understanding of the mechanisms that drive loyalty in online shopping contexts.

Site quality refers to the overall performance and usability of an online shopping platform. A well-designed website that is easy to navigate, visually appealing, and provides relevant information enhances the user experience and increases the likelihood of repeat purchases. E-commerce websites serve not only as tools to facilitate business transactions but also as channels for companies to interact and communicate with their consumers (Sullivan & Kim, 2018). Key aspects of website quality encompass information quality, website design, shopping convenience, security, and communication. High-quality information fosters consumer trust, while a user-friendly website design smooths navigation and mitigates frustration. Website design is essential for marketing activities aimed at enhancing customer loyalty. Extensive research has demonstrated a significant relationship between website quality and customer satisfaction. According to Kim et al. (2012), satisfaction is perceived as an assertiveness that arises from a psychological comparison of the service and quality that a customer or consumer expects to receive from a transaction after purchase. Customer satisfaction denotes an expected outcome of service that involves assessing whether the service has met the customer's desires and expectations (Mbango, 2018). High-quality websites, characterized by superior information, system, and service quality, enhance customer satisfaction and trust, thereby strengthening customer relationships. Furthermore, Saleem et al. (2022) highlighted that website quality not only boosts customer satisfaction but also encourages electronic word-of-mouth and purchase intentions, with gender differences playing a moderating role in risk-taking behaviors. The following hypothesis was formulated based on the literature review:

Hypothesis 1. *Site quality positively impacts customer satisfaction.*

Trust and security are essential for online repurchase intentions. Consumers hesitate to engage in online transactions if they perceive a risk of fraud, identity theft, or data breaches. E-commerce businesses must implement robust security measures to safeguard customer data and foster a sense of trust. Trust can be built through various mechanisms, including clear privacy policies, secure payment gateways, and third-party certifications (Sullivan & Kim, 2018). The quality of a website significantly impacts customer trust in e-commerce. This relationship is examined in several studies, which highlight various dimensions of site quality and its effect on

customer perceptions (Shin et al., 2013; Hong & Cha, 2013; Masturoh & Mugiono, 2020; Guo et al., 2023). E-service quality has been demonstrated to positively influence customer trust. For instance, studies show that higher e-service quality of the site enhances customer satisfaction and trust, both of which are essential for fostering customer loyalty and encouraging repeat purchases (Etha et al., 2024). Hence, this study assumes the following:

Hypothesis 2. *Site quality positively impacts customer trust.*

Website quality is crucial for fostering customer commitment in e-commerce. A well-designed, user-friendly website with intuitive navigation and aesthetic appeal enhances commitment and loyalty (Guo et al., 2023). Efficient organization and responsiveness increase perceived value while reducing risk, thereby fostering trust and encouraging repeat purchases. Conversely, poor design and complicated checkout processes deter customers, leading to cart abandonment and diminished trust. According to Kessel (2024), nearly 80% of shoppers abandon purchases due to cumbersome checkout experiences. Therefore, investing in high-quality website design is essential for maintaining customer commitment. Based on that, the following state is developed:

Hypothesis 3. *Site quality positively impacts customer commitment.*

In general, online purchasing behavior can be conceptualized as a two-stage process. The first stage involves stimulating customers' initial purchase intentions, while the second stage focuses on fostering the actual realization of these intentions into completed transactions. Both stages are critical in determining the overall success of e-commerce platforms, as they influence not only consumer engagement but also long-term customer retention and business sustainability (Kumar et al., 2024). Customer satisfaction is a crucial factor in the business-to-consumer (B2C) online marketplace, serving as a key measure of success. It is an overall attitude developed from a customer's experience after purchasing a product or utilizing a service. Satisfaction stems from the evaluation of interactions with a service provider and helps customers anticipate future experiences (Mosavi & Ghaedi, 2012). Customer satisfaction reflects the strength of a customer's belief that a service will generate a positive outcome. It is shaped by the purchasing experience and significantly influences future behaviors, including online repurchases and brand loyalty (Rita et al., 2019; Pereira et al., 2017). Satisfied customers are more likely to return for future purchases and recommend the online retailer to others (Pereira et al., 2017), while dissatisfied customers may abandon the retailer without voicing their concerns. Based on these findings, the following hypothesis arises:

Hypothesis 4. *Customer satisfaction positively impacts repurchase intention.*

Trust in e-commerce is generally analyzed in two separate phases: before and after the purchase (Kim et al., 2012). Since this study focuses on analyzing the impact of trust on repurchase intention, trust is measured specifically at the post-purchase stage. Unlike initial trust, which is formed before a consumer's first transaction, post-purchase trust develops after consumers have directly experienced the online retailer's service quality, product reliability, and transaction security. At this stage, trust is shaped by prior interactions and plays a crucial role in influencing customers' willingness to engage in repeat purchases (Sullivan & Kim, 2018). Based on the statements provided, a hypothesis can be formulated as follows:

Hypothesis 5. *Customer trust positively impacts repurchase intention.*

Keiningham et al. (2015) emphasize that commitment is a lasting desire to uphold a valued relationship. Customer commitment is frequently perceived as a psychological attachment or a dedication to maintaining an ongoing relationship with a brand or organization. Research by Mbango (2018) highlights that commitment enhances cooperation between buyers and sellers, fostering continued engagement and brand loyalty. Mosavi & Ghaedi (2012) have

demonstrated a direct correlation between commitment and repurchase behavior, particularly in banking services and branded products, confirming that committed customers are more likely to remain loyal and continue purchasing from the same provider. Ultimately, commitment cultivates trust, stability, and cooperative behavior, all of which contribute to sustained consumer relationships and increased repurchase intentions. Hence, the following hypothesis is proposed:

Hypothesis 6. *Customer commitment positively impacts repurchase intention.*

Based on the literature review and the formulated hypotheses, the conceptual model depicted in Figure 1 was developed.

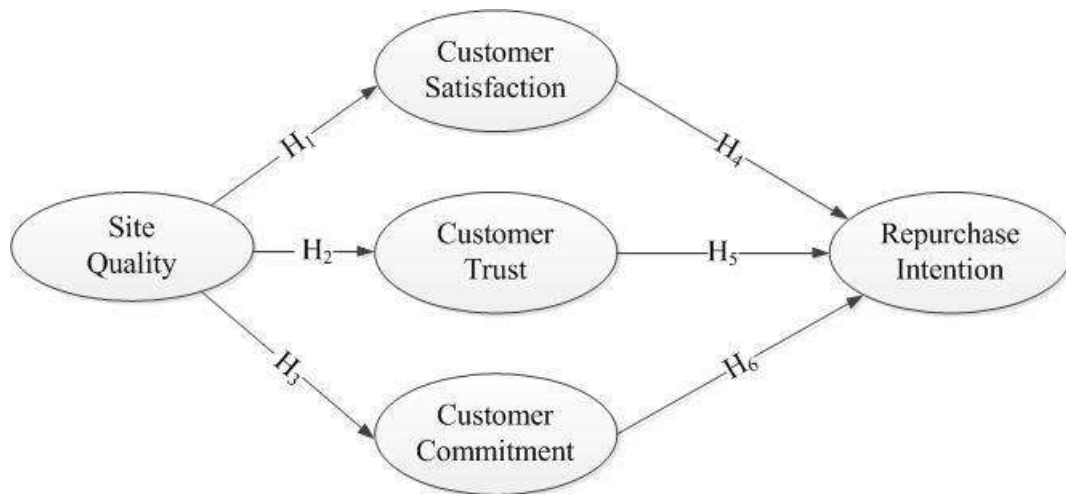


Figure 1. The conceptual model

3. METHODOLOGY

This section outlines the research methodology employed to investigate the factors influencing consumers' online repurchase intentions. It describes the data collection methods, measurement scales used, and the statistical techniques applied to analyses the data.

3.1. Sampling and data collection

The study employed a survey questionnaire to collect data from a sample of online consumers in Serbia. A convenience sampling method was applied, and data were collected through both digital survey platforms and printed forms, ensuring accessibility for e-commerce users. The data collection process occurred during 2024. All analyses were conducted using IBM SPSS Statistics v.24.0 and SmartPLS v.4 software packages (Ringle et al., 2024).

The sample consisted of 252 respondents, with 49.2% being female and 50.8% being male. The age distribution of the respondents was as follows: 34.1% were between 18-30 years old, 25.8% were between 31-40 years old, 24.6% were between 41-50 years old, and 15.5% were 51 years old or older. The majority of respondents (47.2%) had a bachelor's degree or higher.

3.2. Measuring instrument development

The questionnaire included validated scales to measure the key constructs of interest, including site quality, customer satisfaction, customer trust, customer commitment and repurchase intention.

The primary dependent variable, Repurchase Intention (RI), was measured using the questionnaire proposed by Rita et al. (2019) and Shin et al. (2013) composed of 3 items measured on a 5-point Likert scale. Exploratory factor analysis (KMO = 0.660, Bartlett's test: chi-square = 309.136 with 3 degrees of freedom, $p < 0.001$) revealed that repurchase intention is a one-dimensional construct, and one factor explains roughly 74.2% of the variance of all the items, which is well above the commonly recommended threshold of **60%**.

Site Quality (SQ) was measured using a 6 item long scale developed and tested by Rita et al. (2019) and Shin et al. (2013). Exploratory factor analysis revealed that a single construct explains nearly 61.2% of the cumulative variance of all the items (KMO = 0.874, Bartlett's test: chi-square = 707.924, with 15 degrees of freedom, p -value < 0.001).

Customer Satisfaction (CS) was measured using scales assessing overall satisfaction with the purchase experience and operationalized following the framework proposed by Shin et al. (2013) and Rita et al. (2019). The scale, comprising 3 items constituted a one-dimensional construct (KMO = 0.752; approx. chi-square = 580.059 with 3 degrees of freedom, $p < 0.001$), explaining over 86.7% of the cumulative variance of the items.

Customer Trust (CT) was measured using the scale developed by Hong and Cha (2013), and Shin et al. (2013) composed of 4 items measured on a 5-point Likert scale. Exploratory factor analysis (KMO = 0.834, Bartlett's test: chi-square = 1001.104, with 6 degrees of freedom, $p < 0.001$) showed that organizational unlearning is a unidimensional construct, and one factor explains over 85.8% of the variance of all the items.

Customer Commitment (CC) were measured using a 4 item research tool measured on a 5-point Likert scale, previously developed and tested by Shin et al. (2013) and Masturoh and Mugiono (2020). Exploratory factor analysis (KMO = 0.715, Bartlett's test: chi-square = 501.045, with 6 degrees of freedom, and $p < 0.001$) revealed that one factor explains over 65.4% of the items' variance.

3.3. Data analysis techniques

To evaluate the proposed interrelationships among site quality, customer satisfaction, customer trust, customer commitment, and repurchase intention, structural equation modeling (SEM) was utilized with partial least squares (PLS) analysis. The SEM methodology facilitates the examination of causal relationships between the constructs within the model while assessing the model's overall fit with the observed measurement data (Hair et al., 2022). Furthermore, to investigate the mediating roles of customer satisfaction, customer trust, and customer commitment in the relationship between site quality and repurchase intention, this study followed a mediation analysis procedure. In addition to PLS-SEM, this study employed fuzzy set qualitative comparative analysis (fsQCA) to gain deeper insights into the complexity of customer behavior. Unlike PLS-SEM, which focuses on linear relationships and the significance of individual predictors, fsQCA identifies various combinations of factors that lead to high repurchase intentions. FsQCA goes beyond traditional multiple regression analyses (MRAs) and allows for the exploration of multiple pathways to the same outcome, capturing the nuanced and non-linear nature of consumer decision-making (Pappas & Woodside, 2021). By integrating PLS-SEM and fsQCA, this study offers a comprehensive analysis.

4. RESULTS

4.1. Common method bias

Harman’s single-factor test was performed to assess common method bias (CMB). The results revealed that the variance explained by a single factor was 43.7%, which is below the 50% threshold value suggested by Kock (2015), indicating that CMB is unlikely to be a concern. These findings suggest that the study’s model is free from common method bias, ensuring the validity and reliability of the data collected. The lack of CMB indicates that the connections between constructs are not overstated due to measurement artifacts, thus enhancing the reliability of the statistical conclusions. Consequently, the results can be regarded as a robust reflection of the actual patterns within the sample, enhancing the credibility of the study’s findings and their theoretical and practical implications.

4.2. Measurement model evaluation

The measurement model was first assessed through internal consistency reliability, convergent validity, and discriminant validity (Hair et al., 2021). Cronbach’s Alpha, Spearman-Brown’s coefficient and Composite Reliability (CR) were evaluated to assess the reliability of the variables. The factor loadings, validity, and reliability results are presented in Table 1.

Table 1. Construct reliability and validity

Construct	Items	Loadings	Cronbach alpha ($C\alpha$) ^a	Spearman-Brown Coefficient ^b	Composite reliability (ρ_{oa}) ^c	Composite reliability (ρ_{oc}) ^c	(AVE) ^d
Customer Commitment (CC)	CC_1	0.704	0.825	0.864	0.831	0.896	0.741
	CC_2	0.883					
	CC_3	0.910					
	CC_4	0.870					
Customer Satisfaction (CS)	CS_1	0.914	0.923	0.918	0.924	0.951	0.867
	CS_2	0.946					
	CS_3	0.934					
Customer Trust (CT)	CT_1	0.932	0.945	0.921	0.945	0.961	0.859
	CT_2	0.944					
	CT_3	0.933					
	CT_4	0.898					
Repurchase Intention (RI)	RI_1	0.807	0.879	0.813	0.896	0.910	0.632
	RI_2	0.917					
	RI_3	0.857					
Site Quality (SQ)	SQ_1	0.823	0.809	0.845	0.826	0.879	0.651
	SQ_2	0.852					
	SQ_3	0.821					
	SQ_4	0.821					
	SQ_5	0.777					
	SQ_6	0.703					

Notes: ^a $C\alpha \geq 0.70$; ^bSpearman-Brown Coefficient ≥ 0.70 ; ^c $\rho_{oa} \geq 0.70$; ^c $\rho_{oc} \geq 0.70$; ^dAVE ≥ 0.50 ;

Cronbach’s alpha (α) coefficients above 0.70 indicate strong internal consistency, as do Spearman-Brown coefficients, whose values range above 0.8 and 0.9. The CRs surpass the recommended threshold of 0.7 and suggest that the measurement model is dependable, which means that the items used to assess the construct are internally consistent and yield reliable results. The average variance extracted (AVE) and factor loadings were utilized to evaluate convergent validity (Fornell & Larcker, 1981). As shown in Table 1, all AVE values were above 0.5, with factor loadings exceeding 0.7, confirming convergent validity.

Table 2. Results of discriminant validity using Fornell-Larcker criteria and Heterotrait-Monotrait (HTMT) method

Construct	Mean	STD	Fornell-Larcker Criterion					Heterotrait-Monotrait (HTMT) ratio				
			CC	CS	CT	RI	SQ	CC	CS	CT	RI	SQ
CC	3.96	0.64	0.807					-				
CS	4.17	0.81	0.352	0.931				0.416				
CT	3.82	0.97	0.409	0.660	0.927			0.469	0.706			
RI	3.23	0.94	0.576	0.573	0.544	0.861		0.705	0.648	0.607		
SQ	3.67	1.00	0.430	0.719	0.730	0.559	0.795	0.532	0.792	0.788	0.654	-

Discriminant validity was assessed using the Fornell and Larcker criterion and the Heterotrait-Monotrait (HTMT) method. The results for the Fornell and Larcker criterion and findings from the HTMT matrix are presented in Table 2. The factor loadings exceeded their respective cross-loadings, and all HTMT values remained below 0.9, confirming discriminant validity through both approaches. Consequently, the study established both convergent and discriminant validity while ensuring internal consistency reliability.

4.3. Structural model evaluation

After confirming that each construct has good reliability and validity, this research evaluated the structural model, including evaluating the prediction of the model and the relationship between the constructs. Structural model evaluation was conducted using SmartPLS (Ringle et al., 2024) to examine the relationships among the established constructs and ascertain their statistical significance. The model was tested employing a bootstrapping procedure with 5,000 resamples and 95% bias-corrected confidence intervals, thereby ensuring robust estimation of path coefficients and hypothesis testing. This methodology facilitated the calculation of key model parameters, including the coefficient of determination (R^2), effect size (f^2), t-values (one-tailed test), standardized beta coefficients (β), and the Q^2 test of predictive relevance using the blindfolding technique. To evaluate potential collinearity issues, Variance Inflation Factor (VIF) values were assessed for all predictor constructs, following the guidelines of Hair et al. (2019). The results indicated that all VIF values were below the threshold of 5, confirming that this research does not have a collinearity problem. The one-tailed test assumes a t-value of 1.96 or higher at a 5% significance level, indicating statistical significance (Hair & Alamer, 2022). The hypothesized relationships between the variables were examined, with the analysis results shown in Table 3 and Figure 2.

In the first part of the model, the direct impact of the construct site quality on customer satisfaction ($\beta = 0.719$, $t = 17.666$, $p < 0.01$), customer trust ($\beta = 0.730$, $t = 24.344$, $p < 0.01$), and customer commitment ($\beta = 0.430$, $t = 7.207$, $p < 0.01$) was analyzed. The results obtained indicate that all hypothesized relationships are statistically significant and confirmed. Therefore, hypotheses H_1 , H_2 , and H_3 were accepted. Additionally, three further hypotheses were tested, examining the direct impact of the constructs of customer satisfaction ($\beta = 0.322$, $t = 4.617$, $p < 0.01$), customer trust ($\beta = 0.170$, $t = 2.100$, $p < 0.01$), and customer commitment ($\beta = 0.393$, $t = 6.052$, $p < 0.01$) on customer repurchase intention. The results indicate that hypotheses H_4 , H_5 , and H_6 are statistically significant and have been confirmed.

Table 3. Results of hypothesis testing

Hypotheses	Path coefficient(β)	t-value	p-value	f^2	VIF	R^2	Q^2	Result
H1: SQ \rightarrow CS	0.719	17.666	0.000*	1.068 ^c	1.000	0.516	0.488	Supported
H2: SQ \rightarrow CT	0.730	24.344	0.000*	1.140 ^c	1.000	0.533	0.518	Supported
H3: SQ \rightarrow CC	0.430	7.207	0.000*	0.227 ^b	1.000	0.185	0.176	Supported
H4: CS \rightarrow RI	0.322	4.617	0.000*	0.116 ^a	1.796	0.503	0.295	Supported
H5: CT \rightarrow RI	0.170	2.100	0.036**	0.031 ^a	1.890			Supported
H6: CC \rightarrow RI	0.393	6.052	0.000*	0.255 ^b	1.218			Supported

Note: Path significance: * $p < 0.01$; ** $p < 0.05$; f^2 thresholds: $a > 0.02$ (weak effect); $b > 0.15$ (moderate effect); $c > 0.35$ (strong effect).

The coefficient of determination (R^2) quantifies the predictive accuracy of a model by assessing the proportion of variance in the endogenous variables explained by all exogenous variables. R^2 values range from 0 to 1, with higher values indicating greater predictive power. According to Hair and Alamer (2022), R^2 values of 0.75, 0.50, and 0.25 are classified as substantial, moderate, and weak, respectively. In the structural model (Figure 2), the R^2 values for customer satisfaction (0.516), customer trust (0.533), and repurchase intention (0.503) suggest moderate predictive accuracy, while the R^2 for customer commitment (0.185) is weak.

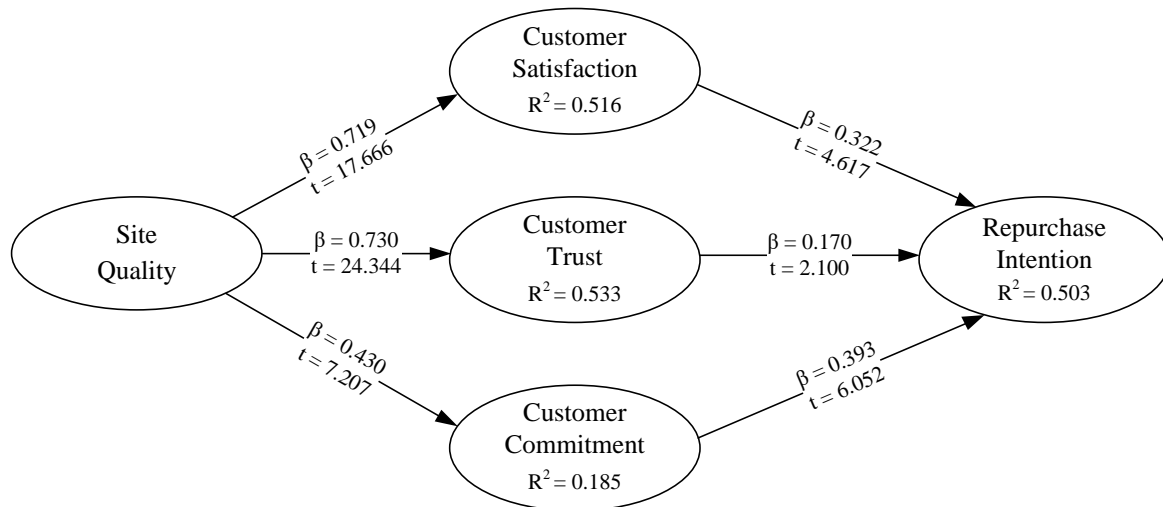


Figure 2. Structural path results

To assess the predictive validity of the structural model, Q^2 predict was examined (Shmueli et al., 2016). When the results are confirmed to have predictive relevance, it indicates that the model can accurately predict the endogenous construct of the reflective measurement model and the indices of the endogenous construct for a single item. In the structural model, the Q^2 value of the reflective endogenous latent constructs exceeded 0, suggesting that both the path models and the construct possess predictive relevance. The Q^2 predict values for all constructs were positive (Table 3), indicating that the model exhibits acceptable predictive relevance (Hair et al., 2021). Notably, customer satisfaction (0.488) and customer trust (0.518) demonstrated the highest predictive power, suggesting that the model can reliably forecast

variations in these constructs. Conversely, customer commitment (0.176) and repurchase intention (0.295) exhibited relatively lower, albeit still acceptable, predictive strength.

Table 4 presents the total indirect effects within the structural model, providing a comprehensive analysis of the relationships between constructs and their influence on repurchase intention. Indirect effects illustrate the extent to which an independent variable affects the dependent variable through one or more mediating variables.

Table 4. Results of indirect effects

Influence relation	Original sample	Sample mean	2.50 % LB	97.50 % UB	t-value	p-value	Result
SQ → CS → RI	0.232	0.230	0.127	0.326	4.585	0.000*	Significant
SQ → CT → RI	0.124	0.126	0.011	0.246	2.061	0.039**	Significant
SQ → CC → RI	0.169	0.170	0.104	0.246	4.693	0.000*	Significant

*Note: *significant at the level of 0.01; **significant at the level of 0.05*

The results presented in Table 4 indicate that evaluating the influence of site quality on repurchase intention is mediated by customer satisfaction, customer trust, and customer commitment. SQ → CS → RI ($\beta = 0.232$, $p < 0.001$) suggests partial mediation, where CS enhances the impact of site quality on repurchase intention. SQ → CT → RI ($\beta = 0.124$, $p = 0.039$) is significant but weaker, showing that trust plays a role, albeit less pronounced. SQ → CC → RI ($\beta = 0.169$, $p < 0.001$) is also significant, underscoring the importance of customer commitment in driving repurchase behavior.

4.4. Fuzzy set qualitative comparative analysis

Fuzzy set qualitative comparative analysis (fsQCA) analysis was conducted using software fs/QCA 3.0 (Ragin & Davey, 2016). The following section presents the results of the analysis, highlighting the necessary and sufficient conditions that lead to high and low online repurchase intention.

4.4.1. Calibration - transforming data into fuzzy sets

The most important step in configurational analysis is data calibration, which involves transforming all variables into fuzzy set values ranging from 0 to 1 (Ragin, 2008). This process ensures that each case is assigned a degree of membership within a given set, allowing for a more nuanced analysis of causal relationships. Data calibration can be performed using either the direct or indirect method. In the direct method, the researcher establishes three qualitative breakpoints to define full membership, full non-membership, and intermediate membership in a set. Conversely, in the indirect method, data are rescaled based on qualitative assessments rather than predefined thresholds, with the choice of method depending on the nature of the data and the theoretical framework guiding the analysis (Ragin, 2008). For this study, the direct method was applied, with qualitative breakpoints determined using percentiles, as recommended by Pappas and Woodside (2021). The 95th percentile was set as the threshold for full-set membership, the 5th percentile for full-set non-membership, and the 50th percentile for intermediate-set membership. These values were calibrated using a logistic function within the fsQCA software to ensure an appropriate distribution across the three membership levels. The statistics used for data calibration are presented in Table 5.

Table 5. Percentile chosen for data calibration

Variable → Thresholds ↓	Customer Commitment (CCc)	Customer Satisfaction (CSc)	Customer Trust (CTc)	Site Quality (SQc)	Repurchase Intention (RIc)
5 th percentile	1.75	3.00	2.00	2.87	1.88
50 th percentile	3.25	4.00	4.00	4.00	3.67
95 th percentile	5.00	5.00	5.00	4.95	5.00

Following the calibration of the fuzzy-set dataset, the next analytical phase involves conducting a Necessary Condition Analysis (NCA). This step aims to determine the extent to which a given causal condition exhibits fuzzy-set scores that meet or fall below a predefined threshold necessary for achieving a particular outcome. Following established methodological guidelines, the necessity analysis assessed whether a condition met the consistency threshold of 0.90 (Ragin, 2008). A condition is classified as necessary if its consistency value exceeds this threshold, signifying that the outcome cannot be achieved without the presence of that condition. Additionally, conditions with consistency values ranging between 0.80 and 0.90 are considered “almost always necessary” provided their coverage score exceeds 0.75.

Table 6. Results of Necessary Condition Analysis for Repurchase Intention

Conditions	High RI		Low/ Medium RI	
	Consistency	Coverage	Consistency	Coverage
CSc	0.855	0.750	0.576	0.474
~ CSc	0.400	0.500	0.695	0.819
CTc	0.732	0.791	0.462	0.470
~CTc	0.509	0.502	0.794	0.736
CCc	0.743	0.799	0.482	0.488
~CCc	0.524	0.518	0.801	0.746
SQc	0.749	0.757	0.522	0.497
~SQc	0.502	0.528	0.745	0.736

The results of the necessary condition analysis (Table 6) indicate that customer satisfaction satisfies the criteria for a necessary condition in achieving repurchase intention, with a consistency score exceeding 0.80. Conversely, other examined factors, including customer satisfaction, customer trust, and site quality, did not meet the threshold necessary to influence repurchase intention.

4.4.2. Obtaining the solutions

Following the data calibration process, the next step in fuzzy-set Qualitative Comparative Analysis (fsQCA) involves running the fsQCA algorithm, which generates a truth table. This table consists of 2^k rows, where k represents the number of predictor variables, and each row corresponds to a unique combination of these predictors (Ragin, 2008). The truth table is then systematically analyzed by sorting rows based on two critical metrics: frequency and consistency. Frequency refers to the number of observations that correspond to each specific combination of conditions. To ensure reliable assessment, a minimum frequency threshold is established. According to Fiss (2011) and Ragin (2008), for datasets with more than 150 cases, the threshold should be set at 3, while for smaller samples, a threshold of 2 may be appropriate. In this study, a threshold of 3 is adopted, and all combinations with lower frequencies are excluded from further analysis. Consistency measures the extent to which cases conform to the set-theoretic relationships defined in a given solution (Fiss, 2011). A recommended consistency threshold of 0.75 is applied (Ragin, 2008), meaning that only combinations meeting or

exceeding this threshold are considered valid explanatory configurations. After filtering the truth table based on these thresholds, combinations that surpass the consistency threshold are classified as those that fully explain the outcome. In such cases, the outcome variable is set to 1, while all remaining combinations are assigned a value of 0.

Finally, the outcomes of the analysis encompass complex, parsimonious, and intermediate combinations of configurations. The complex solution encompasses all possible configurations of conditions derived through traditional logical operations. Complex solutions are refined into parsimonious and intermediate solutions, which are more straightforward and open to interpretation. The parsimonious solution represents a streamlined version of the complex solution, derived through simplifying assumptions (Pappas et al., 2016). It highlights the most essential conditions that must be included in any valid solution, referred to as “core conditions” (Fiss, 2011), which are automatically identified by fsQCA. The key distinction between parsimonious and complex solutions lies in their treatment of counterfactual cases, the complex solution excludes them and applies minimal simplification, whereas the parsimonious solution incorporates counterfactual combinations to achieve a more concise and logically simplified outcome (Pappas & Woodside, 2021). Intermediate solution is a balance between the complex and parsimonious solutions. The intermediate solution uses a subset of those simplifying assumptions used to compute the parsimonious solution, which should be consistent with theoretical and empirical knowledge. Typically, results are presented with intermediate solutions, clearly indicating (often highlighted) the parsimonious components contained within. The parsimonious and intermediate solutions for both high and low levels of repurchase intention are detailed in Table 7. Specifically, black circles (●) indicate the presence of a condition, while crossed-out circles (⊗) signify its absence (Fiss, 2011; Pappas & Woodside, 2021). Blank spaces represent the “do not care” situation. The conditions displayed include both core and peripheral conditions.

Table 7. Configurations that lead to high and low/medium Repurchase Intention

Configuration	Solutions for high RI					Solutions for low/medium RI			
	1	2	3	4	5	6	7	8	9
Customer commitment		⊗	●	●	●		⊗	⊗	●
Customer satisfaction	●	●	⊗	●				●	⊗
Customer trust		⊗		●	●	⊗	⊗		
Site quality	⊗		●		●	⊗		⊗	●
Consistency	0.797	0.772	0.872	0.934	0.924	0.801	0.832	0.825	0.818
Raw Coverage	0.417	0.348	0.252	0.572	0.552	0.683	0.659	0.377	0.251
Unique Coverage	0.029	0.019	0.015	0.012	0.003	0.086	0.069	0.031	0.018
<i>Overall Solution Coverage</i>	0.776					0.789			
<i>Overall Solution Consistency</i>	0.811					0.816			

Note: (●) indicates the presence of a condition, and (⊗) indicates its absence. Large circles represent core conditions; small circles represent peripheral conditions. Blank spaces imply “don’t care” condition.

Table 7 displays both consistency and coverage for the overall solution and for each individual solution. All values exceed the recommended threshold of 0.75 (Ragin, 2008). Consistency reflects how well a relationship has been approximated, while coverage assesses the empirical relevance of the consistent subset. Therefore, the overall solution coverage indicates how high repurchase intention in e-commerce may be influenced by the configurations

set, which can be compared to the R^2 value (Pappas & Woodside, 2021). The study explores two outcomes: high repurchase intention and low repurchase intention. Solution coverage, representing the degree to which identified solutions explain observed outcome cases, is notably high. This indicates that the recognized combinations of conditions account for a substantial portion of the observed outcomes, specifically reaching coverage rates of 77% and 79%, respectively. That reveals that the five solutions (1-5) and four solutions (6-9) represent a significant portion of high and low/medium repurchase intentions in e-commerce. In contrast, the consistency, which pertains to maintaining uniformity across various cases in the dataset, is also high, at 0.81 and 0.82, respectively. This indicates that the results are reliable and account for the majority of the cases examined. Additionally, fsQCA assesses the empirical relevance of each solution by measuring both raw and unique coverage. Raw coverage refers to the share of the outcome attributed to a specific alternative solution, whereas unique coverage denotes the share of the outcome that only a particular alternative solution can account for. The solutions detailed in Table 7 clarify a considerable amount of high and low/medium repurchases intentions, accounting for 25.1% to 68.3% of the associated cases.

The presence of customer satisfaction leads to high repurchase intentions when site quality is absent, regardless of the other factors (solution 1). Next, when customer satisfaction is present, high purchase intention may be achieved with an absence of customer commitment and trust, regardless of the site quality (solutions 2). Furthermore, the combination of customer commitment and site quality leads to high purchase intention in e-commerce, regardless of customer trust (solution 3). Furthermore, customer commitment, satisfaction, and trust contribute to a high repurchase intention in e-commerce when site quality is deemed to be in a “do not care” state (solution 4). Ultimately, customer commitment and trust, combined with site quality, also result in a high repurchase intention when customer satisfaction beliefs are in a “do not care” state (solution 5). Consistency values of 0.934 (solution 4) and 0.924 (solution 5) indicate that these solutions are highly reliable in predicting high repurchase intention. Raw coverage values of 0.572 and 0.552, respectively, suggest that these are dominant pathways, explaining a large proportion of cases.

The four solutions leading to low/medium repurchase intention (Solutions 6-9) suggest different combinations of conditions that hinder customer repurchase behavior. Solution 6, with a consistency score of 0.801, indicates that the absence of both customer commitment and trust significantly contributes to low repurchase intention in e-commerce. Additionally, when customer commitment and satisfaction beliefs are in a “do not care” state, it reinforces the notion that a lack of trust and commitment plays a crucial role in reducing the likelihood of repurchasing. The absence of customer commitment and trust leads to low repurchase intention regardless of the other factors (solution 7). Further, the absence of customer commitment and site quality with the presence of customer satisfaction, regardless of customer trust, leads to low repurchase intention (solution 8). Finally, the same outcome may be achieved by the presence of customer commitment site quality with the absence of customer satisfaction (solution 9).

5. DISCUSSION OF THE RESULTS

Firstly, this paper evaluated six developed hypotheses using the PLS-SEM methodology. The results show that all the analyzed hypotheses proposed in the model have been supported. In the developed research model, the positive and statistically significant influence of site quality on customer satisfaction, customer trust, and customer commitment was analyzed and confirmed. Hypothesis H_1 suggests that site quality positively influences customer satisfaction, a finding supported by the results obtained. This result indicates that a well-designed, user-friendly, and reliable website enhances customers' overall satisfaction,

reinforcing their positive perception of the platform. This finding aligns with previous studies that emphasize the critical role of site quality in shaping customer experiences and behaviors. For instance, Saleem et al. (2022) highlight that key elements such as website usability, visual appeal, and navigation efficiency significantly contribute to customer satisfaction. Similarly, Rita et al. (2019) stress that a seamless and engaging online experience fosters a higher level of satisfaction, ultimately influencing customer retention. Additionally, Shin et al. (2013) demonstrate that security, ease of use, and website performance play a crucial role in ensuring customer satisfaction, further validating the results of this study. The results of hypothesis H₂ indicate a positive relationship between site quality and customer trust. These findings align with previous research highlighting the significance of site quality in fostering customer trust (Shin et al., 2013; Rita et al., 2019). For example, Rita et al. (2019) underscore that intuitive design, quick loading speed, and relevant content positively influence users' perceptions of a website's reliability. Likewise, Shin et al. (2013) emphasize that factors such as security, ease of use, and visual appeal bolster customer trust, further supporting the outcomes of this study. The results confirm hypothesis H₃, highlighting the positive impact of site quality on customer commitment. A well-structured and user-friendly website fosters a sense of reliability and engagement, encouraging customers to develop long-term relationships with the platform. High-quality websites that offer seamless navigation, security, and appealing design elements enhance user experience, leading to greater emotional and behavioral commitment. This finding is consistent with previous research indicating that a well-designed website fosters customer attachment and loyalty by creating a positive and trustworthy online environment (Shin et al., 2013; Saleem et al., 2022). According to Wijaya et al. (2021), the quality of the website significantly influences customer loyalty in e-commerce, indicating that better website service quality leads to higher customer commitment. Hsu et al. (2018) highlighted that customer satisfaction significantly impacts trust and commitment, indicating that a high-quality website experience fosters stronger relationships with customers. Furthermore, the effects of customer satisfaction, customer trust, and customer commitment on repurchase intention are examined and confirm hypotheses H₄, H₅, and H₆. The obtained results align with prior studies, such as those conducted by Rita et al. (2019) and Chen et al. (2020) which similarly found that customer satisfaction has a significant positive impact on repurchase intention. This relationship suggests that when customers are satisfied with their online shopping experience, they are more inclined to continue purchasing from the same platform. Satisfied customers are not only more likely to make repeat purchases but also to develop brand loyalty, which increases long-term engagement and fosters positive word-of-mouth recommendations. Similarly, Chen et al. (2020) emphasize that customer satisfaction enhances the likelihood of returning to the same e-commerce platform for future transactions, reinforcing the importance of maintaining high service quality and user experience.

Beyond mere satisfaction, trust plays a crucial mediating role in the relationship between various factors and repurchases intention. Shin et al. (2013) indicate that trust significantly affects customers' willingness to make future purchases, as it diminishes perceived risk and strengthens their confidence in the online retailer. This finding is supported by Rita et al. (2019) and Wandoko and Panggati (2022), who show that heightened levels of customer trust are directly associated with an increased likelihood of repeat purchases. When customers regard an online retailer as trustworthy, they are more inclined to engage in long-term transactions, thereby enhancing the platform's sustainability and growth. Moreover, commitment stands out as a key element influencing repurchase behavior. Iqbal et al. (2024) highlight that fostering customer commitment is crucial for marketing strategies designed to build loyalty and promote repeat purchases. When customers feel a strong commitment, their retention rates improve, as those connected to a specific online retailer are more likely to come

back for additional purchases. This suggests that online retailers should focus on tactics that enhance both trust and commitment, as these factors together boost repurchase intention and cultivate enduring customer relationships.

Additionally, in this study, it was confirmed that site quality through the mediating variables of customer satisfaction, customer trust, and customer commitment has a significant effect on repurchase intention, which is in line with the findings of Shin et al. (2013).

The results of the fsQCA analysis reveal that specific combinations of customer commitment, satisfaction, and trust are key contributors to high repurchase intention in the context of e-commerce.

6. CONCLUSION

In the vast digital landscape, e-commerce has emerged as a transformative force, changing the way businesses operate and how consumers engage with commercial activities. Given that repeat purchases are a key driver of long-term business success, understanding consumer expectations is crucial. Consumers' purchasing needs are not static, and each customer may have distinct expectations concerning the terms of purchase. Therefore, e-commerce companies must continually recognize and respond to their customers' changing needs in order to remain competitive. By integrating PLS-SEM and fsQCA methods, this research paper evaluates the factors influencing consumers' online repurchase intentions. The findings indicate that customer satisfaction, customer trust, and customer commitment are important determinants of online consumers' repurchase intentions.

This research offers both theoretical and practical contributions. It builds upon previous scientific studies by exploring the relationship between these factors and their relative significance in influencing repurchases decisions. The research was conducted in Serbia, where similar research is still limited. Consequently, the study fills the gap in the existing literature and provides new insights into this field of study within the Serbian context.

However, despite its contributions, this study has certain limitations. Firstly, the research is geographically limited to Serbia, which may affect the generalizability of the findings to other markets characterized by different consumer behaviors and economic conditions. Additionally, the study concentrated on specific factors influencing consumers' repurchases intentions. Future research could expand the scope by incorporating additional elements such as price, product quality, and social influence, thereby achieving a more comprehensive understanding of the factors driving repurchase decisions.

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