БЕЛОРУССКИЙ ЭКОНОМИЧЕСКИЙ ЖУРНАЛ. 2026. № 1. С. 136–153.
Belarusian Economic Journal. 2026. No 1. PP. 136–153.

HOW DOES OMNICHANNEL SERVICE QUALITY STIMULATE CONSUMER DELIGHT?

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ABSTRACT. The development of the mobile internet has enabled real-time connectivity between online and offline channels, making the omnichannel model a fashionable new marketing approach. Grounded in the Stimulus-Organism-Response (S-O-R) theoretical framework, this study investigates how omnichannel service quality stimulates consumer delight. Based on a questionnaire survey and empirical analysis of 486 consumers, five dimensions of service quality: Physical stores, staff service, digital interface, privacy and security, and seamless experience – are examined as independent variables; three dimensions of consumer perception are introduced as mediating variables: Perceived fluency, perceived flexibility, and perceived risk, while consumer delight is treated as the dependent variable. The findings provide practical implications for firms seeking to optimize the omnichannel service experience and enhance consumer delight.

KEYWORDS: omnichannel, service quality, consumer perception, consumer delight, empirical study.

JEL-code: M31, D12.

DOI: 10.46782/1818-4510-2026-1-136-153

Received 16.12.2025

Introduction

With the emergence and rise of social media, mobile applications, and other digital technology channels, an increasing number of consumers prefer to use mobile Internet platforms to enhance their personal shopping experience. The omnichannel model – characterized by real-time integration of online and offline channels—has evolved into a more convenient shopping approach and a marketing strategy increasingly favored by firms.

Current research on omnichannel integration mainly proceeds from two levels: the firm level and the customer level. At the firm level, studies primarily focus on business models, marketing strategy planning, and channel portfolio optimization. Burford et al. identified information consistency and cross-channel experience as the two most fundamental aspects of omnichannel design (Burford, Resmini, 2017); Deng Qi et al., from the perspective of manufacturers, designed and tested information consistency, information sharing, and functional coordination as the key elements of channel integration for manufacturing enterprises (Deng, Zhuang, Lu, 2021); Melero et al. pinpointed several critical issues that firms must consider when formulating successful omnichannel retail strategies, including channel integration, unified cross-channel touchpoints, and personalized customer experiences. Customer-oriented research concentrates on issues related to omnichannel service experiences (Melero, Sese, Verhoef, 2016). Chen et al. investigated the barriers customers encounter when using omnichannel services and the synergy across channels (Chen, Lu, Gong, 2019); Li Yue examined, from the customer perspective, how omnichannel retail experiences and customer participation in value co-creation shape brand image (Li, 2022); Chatterjee and Kumar found that demographic variables such as age, income, and education level influence consumers' purchase intentions (Chatterjee, Kumar, 2017).

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In citation: Song Zhengyi. 2026. How Does Omnichannel Service Quality Stimulate Consumer Delight? *Belorusskiy ekonomicheskiy zhurnal*. No 1. PP. 136–153. DOI: 10.46782/1818-4510-2026-1-136-153

In summary, although firms have begun to recognize the importance of omnichannel strategies and are actively implementing them, the realization of expected outcomes largely depends on customers' perceptions and experiences with omnichannel services. Existing research on customer experience mostly adopts the S–O–R model, but relatively few studies incorporate customer perception as a mediating variable. Moreover, as the omnichannel retail model has evolved from multi-channel to cross-channel retailing, scholars have yet to reach consensus on the classification standards of channel service quality. How to improve service quality based on existing foundations and attract a sufficient number of omnichannel shoppers remains crucial for the success of firms' omnichannel strategies.

Therefore, this study adopts a customer-centric perspective and introduces customer perception as a mediating variable to examine how firms' channel service quality influences customers' omnichannel usage behavior, thereby providing practical guidance for firms to enhance their channel service quality.

Theoretical Model and Research Hypotheses

SOR Model

The S–O–R model, first proposed by Mehrabian and Russell, conceptualizes behavior as a response (R) that is influenced by both external stimuli (S) and the internal state of the organism (O).

Stimulus (S): External factors or environmental cues, such as physical store layout, online website design, advertising messages, or sensory stimuli (e.g., music, lighting, or scent). Organism (O): The internal state or psychological and emotional processes of the individual, including emotions, perceptions, attitudes, and cognition. Response (R): The observable behavior triggered by the interaction of stimuli and the organism's internal state, such as approach/avoidance behavior, purchase intention, or engagement with a brand (Mehrabian, Russell, 1974).

The S–O–R model has been widely applied in consumer behavior research, particularly in understanding how environmental cues influence purchasing decisions. Kotler, Donovan and Rossiter demonstrated that stimuli such as music, lighting, and store layout influence consumers' emotional states (organism), which in turn affect approach or avoidance behavior (response) (Kotler, 1973; Donovan, Rossiter, 1982).

The S–O–R model has also been extended to digital environments. Eroglu et al. showed that website design, color schemes, and interactivity serve as stimuli that shape consumer affective responses, which then influence behavioral outcomes like purchase intention and time spent on the site (Eroglu, Machleit, Davis, 2001). Similarly, Kim and Lennon found that perceived ease of use and aesthetic appeal of online stores impact users' emotional states, affecting online purchase behavior (Kim, Lennon, 2010).

Advertising stimuli can trigger emotional and cognitive responses in consumers, mediating purchase behavior. According to Brakus et al., brand experience stimuli—such as visuals, sounds, and messaging—can evoke internal states like pleasure, arousal, or dominance, which strongly predict consumer behavior such as brand loyalty and recommendation intention (Brakus, Schmitt, Zarantonello, 2009).

The S–O–R model provides a robust framework for understanding the mechanisms linking external stimuli to behavior via internal states. By considering emotional and cognitive mediators, the model enhances prediction of consumer behavior beyond simple stimulus–response relationships.

Dimensions of Service Quality (Independent Variable)

The measurement of service quality is a central topic in the marketing field, and analyzing its dimensional structure can help brands enhance their strategic approaches. Existing measurement methods classify service quality into two-dimensional, three-dimensional, and multidimensional frameworks. Grцnroos divided service quality into two aspects: functional quality and technical quality (Grцnroos, 1984). Parasuraman, Zeithaml, and Berry developed the gap model and subsequently proposed the SERVQUAL perceived quality evaluation model. They argued that perceived service quality consists of five dimensions: responsiveness, tangibility, reliability, assurance, and empathy. However,

due to the ambiguity of evaluating the service process within the SERVQUAL model, they further refined the framework by constructing a gap analysis model to more thoroughly investigate factors influencing service quality (Parasuraman, Zeithaml, Berry, 1985).

Since then, most scholars have conducted studies on service quality measurement based on the SERVQUAL model, adapting it to different industries and contextual settings. Dabholkar et al. argued that service quality in the retail industry encompasses five dimensions: physical aspects, reliability, personal interaction, problem-solving, and store policies (Dabholkar, Thorpe, Rentz, 1995). Building on this, Zhao Hui extended Dabholkar's research and categorized retail service quality into four dimensions: trustworthiness, responsiveness, convenience, and appearance (Zhao, 2007). Li et al. demonstrated that trust, ease of use, responsiveness, and reliability determine electronic service quality (Li, Sun, Guo, 2004).

Given the increasing integration of the Internet and the physical economy, some scholars have also evaluated service quality in emerging business models. Zhang et al. examined unmanned retail—one of the typical forms of new retail—and expanded traditional service quality models by adding the dimensions of recovery, security, and interactivity, offering related optimization suggestions (Zhang, Jiang, Wu, 2018). He Xueping analyzed key brand touchpoints in omnichannel shopping experiences and divided service quality evaluation into seven dimensions: store layout, employee interaction, functionality, aesthetic design, security, integration, and logistics fulfillment. The study particularly highlighted the critical role of integration — based on «seamless» experience — in measuring omnichannel service quality (He, 2016). Guo Junhui and Xu Cuiwei synthesized service characteristics across offline and online channels and proposed the Dual-Channel Service Quality Integrated Model (DC-SQ-IM), conducting empirical research across six dimensions: store atmosphere, store customer service, online store functionality, online responsiveness, online assurance, and channel coordination quality (Guo, Xu, 2019).

Drawing on the above research foundations, this study analyzes service quality within the context of omnichannel services across five dimensions: physical stores, staff service, digital interface, privacy and security, and seamless experience.

Dimensions of Consumer Perception (Mediating Variable): Flow Theory

Flow theory was first proposed by the renowned psychologist Csikszentmihalyi and LeFevre, who argued that when individuals focus intensely on a particular task, they experience a psychological state known as flow, characterized by heightened concentration, a distorted sense of time, and feelings of pleasure (Csikszentmihalyi, LeFevre, 1989). Flow is a psychological state defined as an intrinsically rewarding optimal experience, which leads to deep involvement, altered time perception, loss of self-consciousness, and enhanced motivation. In this state, individuals feel efficient, positive, and joyful, becoming fully immersed in the activity at hand. Such experiences motivate individuals to repeatedly engage in the same activity. Flow theory has been extensively applied in the field of marketing. When consumers engage in purchasing activities and focus on an appealing experience, they enter an optimal psychological state. In the flow state, consumers lose self-awareness because their consciousness becomes absorbed in the activity itself—they are fully immersed in the shopping process, disregard other activities (such as losing track of time), and feel a sense of control over their environment (Novak, Hoffman, Yung, 2000).

Flow is a fundamental element in creating consumer experiences, and some scholars have noted its importance in omnichannel shopping environments (Ameen, Tarhini, Shah, Madichie, 2020; Quach, Barari, Moudrə, 2020). With the support of digital technologies, omnichannel shopping integrates traditional shopping methods with smart technologies to provide customers with unique experiences, which has become crucial for winning consumer preference today (Kim, 2021). For example, the flow experience generated during the search process in a specific channel can create memorable experiences, attract consumers, and exert a series of positive effects on their subsequent attitudes and behaviors (Ozkara, Ozmen, Kim, 2017).

Therefore, incorporating the concept of flow into research on omnichannel marketing

can yield valuable insights. Based on previous studies, this paper divides flow into three dimensions: perceived risk, perceived fluency, and perceived flexibility.

Consumer Delight (Dependent Variable)

In current research, scholars have offered different interpretations and measurement approaches for consumer delight. Waterman developed a scale for consumer delight through empirical studies, including dimensions of hedonic enjoyment and personal expression. He later proposed ten dimensions of delight, encompassing hedonic pleasure, achievement-related pleasure, flow experience, interest, self-determination, balance between challenge and skill, frequency and importance, and self-actualization value (Waterman, 1993). Lee et al. proposed a five-dimension model, including purchase, possession, usage, maintenance, and disposal (Lee D., Lee S., Lee R. 2002). Building on this, Sirgy et al. added the preparation stage as a consideration to comprehensively measure consumer delight across different phases (Sirgy, Grzeskowiak, Su, 2005). Peterson et al. proposed a delight scale consisting of two dimensions: meaning in life and pleasure (Peterson, Park, Seligman, 2005).

Hypotheses on the Relationship Between Channel Service Quality and Consumer Perception

Steinfield and Bouwman argued that consumers can more conveniently receive and access information through integrated channels, thereby influencing experiential value (Steinfield, Bouwman, 2002). Goersc confirmed through surveys that interconnection of information channels enables consumers to obtain complete personal information, which affects their perception of the experience; thus, collecting consumers' purchase records and information can help users plan and facilitate purchases (Goersc, 2002). Duncan and Moriarty found that when consumers interact with multiple channels of a retailer, they tend to obtain consistent product information such as prices, stock availability, and variety, which helps them avoid the confusion caused by inconsistent information (Duncan, Moriarty, 2006). Prasarnphanich and Gillenson argued that uncertainty in product quality in online shopping increases perceived risk, whereas online ordering with offline inspection and pickup can effectively reduce perceived risk (Prasarnphanich, Gillenson, 2003). Yang et al. categorized new and existing customers and found that service affects experiential value, which in turn influences customer satisfaction; new customers are more affected by peripheral services, whereas existing customers are more influenced by core services (Yang, Zhu, Shi, Jing, 2016).

Based on the literature review, this study proposes the following research hypotheses:

H1a: Physical stores have a significant positive effect on perceived fluency.

H1b: Staff service has a significant positive effect on perceived fluency.

H1c: Digital interface has a significant positive effect on perceived fluency.

H1d: Privacy and security have a significant positive effect on perceived fluency.

H1e: Seamless experience has a significant positive effect on perceived fluency.

H2a: Physical stores have a significant negative effect on perceived risk.

H2b: Staff service has a significant negative effect on perceived risk.

H2c: Digital interface has a significant negative effect on perceived risk.

H2d: Privacy and security have a significant negative effect on perceived risk.

H2e: Seamless experience has a significant negative effect on perceived risk.

H3a: Physical stores have a significant positive effect on perceived flexibility.

H3b: Staff service has a significant positive effect on perceived flexibility.

H3c: Digital interface has a significant positive effect on perceived flexibility.

H3d: Privacy and security have a significant positive effect on perceived flexibility.

H3e: Seamless experience has a significant positive effect on perceived flexibility.

Hypotheses on the Relationship Between Consumer Perception and Consumer Delight

Hypothesis on the Relationship Between Perceived Fluency and Consumer Delight.

Perceived fluency refers to the extent to which customers experience a smooth,

unobstructed, and continuous journey across different channels in the omnichannel shopping process (Shen, Li , Sun, Wang, 2018). In an omnichannel service environment, customers increasingly expect a seamless and unified service experience across channels, rather than merely using multiple channels simultaneously. Previous research has also shown that a fluent online shopping experience can evoke positive emotional responses (Mosteller, Donthu, Eroglu, 2014).

If omnichannel services provide customers with a seamless cross-channel experience, they are more likely to engage with these services. Prior studies have highlighted that cross-channel integration and the resulting fluency experience are key to the success of omnichannel business. Therefore, when customers perceive a fluent omnichannel experience, it is expected to generate consumer delight. Accordingly, the following hypothesis is proposed:

H4a: Perceived fluency has a significant positive effect on consumer delight.

Hypotheses on the Relationships Between Perceived Risk, Perceived Flexibility, and Consumer Delight.

Throughout the omnichannel shopping journey, consumers seek flexibility—namely, knowledge of any changes in product availability, the ability to modify orders before delivery, and support for post-purchase services. For instance, consumers expect to receive the ordered products at the desired time and place, and encounter no issues with delivery or returns. Consequently, retailers need to flexibly ensure customer satisfaction (Jafari, Nyberg, Hilletofth, 2016).

Furthermore, when customers switch between different channels, they may be concerned about payment security, product availability, and delivery performance (Kazancoglu, Aydin, 2018). Omnichannel shopping flexibility, however, ensures continuity across channels, facilitates convenience, and allows customers to freely switch channels at every stage of the shopping process. This enhances perceived control and reduces perceived risk (Juaneda-Ayensa, Mosquera, Murillo, 2016).

Based on the above reasoning, the following hypotheses are proposed:

H4b: Perceived risk has a significant negative effect on consumer delight.

H4c: Perceived flexibility has a significant positive effect on consumer delight.

Research Model Construction

Based on the above literature review and research hypotheses, this study constructs a model examining the impact of omnichannel service quality on consumer shopping delight, as shown in Figure 1.

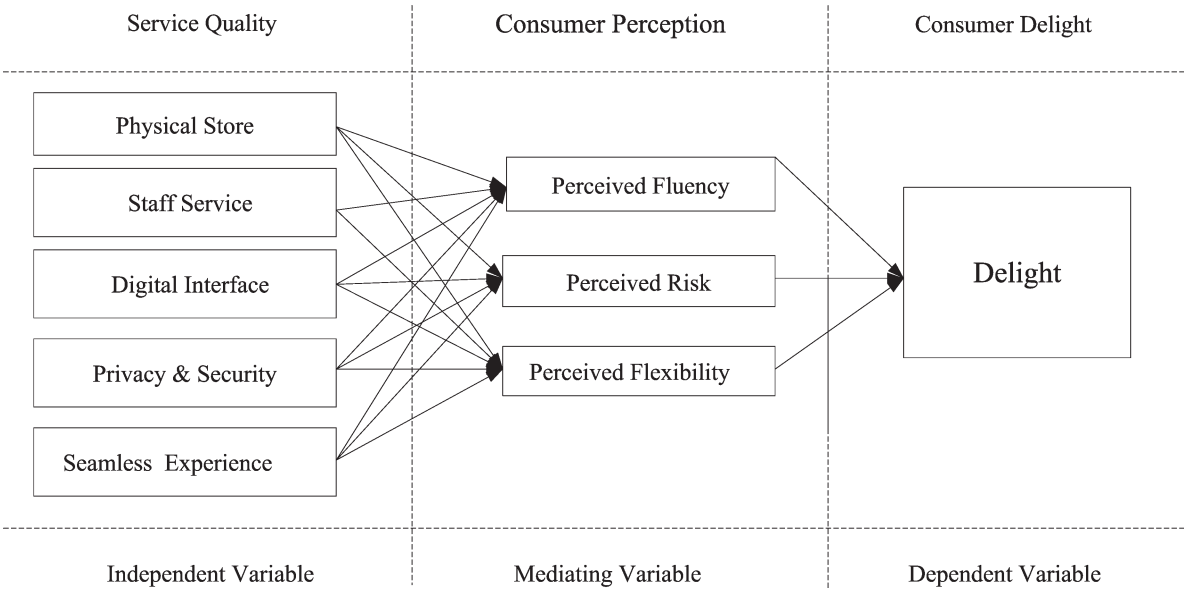

Fig. 1. Direct impact of trade on health

Source. Compiled by the authors.

Research Design

Selection and Measurement of Variables

This study modifies existing indicators and scale items from the literature and ultimately identifies nine key variables for the research. The independent variables include five dimensions: physical stores, personnel service, digital interface, privacy and security, and seamless experience. The mediating variables are perceived fluency, perceived risk, and perceived flexibility, while the dependent variable is consumer delight. The measurement indicators and their references are presented in Table 1.

Table 1

Measurement Indexes

Dimension	Code	Measurement Item	Reference
Physical Store	PST1	The physical store of the retailer is equipped with modern facilities such as self-service machines and virtual product display walls.	(Wang, 2015).
	PST2	The facilities and appearance of the retailer's physical store are attractive.	
	PST3	The retailer's physical store has product experience areas, rest areas, and other activity zones that are clean and comfortable.	
Staff Service	STF1	The retailer's staff have a high level of professional competence to respond to my questions.	(Terblanche, Boshoff, 2004; He, 2016).
	STF2	The retailer's staff demonstrate reliable behavior during the service process.	
	STF3	The retailer's staff are consistently polite to me.	
Digital Interface	DIT1	The webpage layout and arrangement of the retailer's virtual channel are reasonable, and the webpage design is aesthetically pleasing.	(He, 2016; Zhang, 2016).
	DIT2	Product information in the retailer's virtual channel is updated in a timely manner, and images, multimedia videos, and other content have good visual effects.	
	DIT3	The shopping steps in the retailer's virtual channel are simple, and transactions are time-saving.	
Privacy & Security	PRS1	The webpages of the retailer's virtual channel provide security identification marks or alert messages.	(He, 2016; Zhang, 2016).
	PRS2	The retailer's virtual channel does not disclose my personal information.	
	PRS3	The retailer's virtual channel ensures the safety of my financial assets.	
Seamless Experience	SML1	The product information (variety, specifications, inventory, etc.) across the merchant's channels is consistent.	(Parasuraman, Zeithaml, Malhotra, 2005; He, 2016).
	SML2	I can get consistent responses to the same service request submitted through different channels of the merchant.	
	SML3	Points or coupons are valid across all channels of the merchant.	
Perceived Fluency	PFL1	I can smoothly move from one retail channel to another.	(Shen, Li, Sun, Wang, 2018).
	PFL2	After switching from one channel of a retailer to another, I can easily find the same content.	
	PFL3	When interacting with the retailer, I do not need to explicitly consider the channels.	
	PFL4	I can smoothly transfer tasks between different channels.	
Perceived Risk	PRK1	I am worried that the products purchased on this platform might be counterfeit or not match the description.	(Featherman, Pavlou, 2003; Forsythe, Liu, Shannon, Gardner, 2006).
	PRK2	I am concerned that my payment information might be stolen on this platform.	
	PRK3	I worry that the post-purchase return or exchange process will be very troublesome.	
	PRK4	I am concerned about long delivery times or packages being lost/damaged during transit.	
Perceived Flexibility	PFX1	I can try on products in-store and then order them online.	(Shi, Wang, Chen, Zhang, 2020).
	PFX2	I can choose alternative channels for a given service.	
	PFX3	I can place an order online and pay/pick up offline.	
	PFX4	After-sales service can be provided across channels.	
Delight	DL1	The services provided by this retailer give me a greater sense of satisfaction.	(Waterman, 1993; Shen, Hu, Luo, 2021).
	DL2	The services provided by this retailer make me happier.	
	DL3	When shopping at this retailer, I feel good.	
	DL4	I find the services provided by this retailer to be thoughtful.	

Questionnaire Design and Sample Data Collection

The survey questionnaire used a 5-point Likert scale and included a questionnaire introduction, measurement items, and demographic variables[1]. The questionnaire was randomly distributed through Wenjuanxing (www.wjx.cn)[2]. A total of 500 questionnaires were collected, and after screening, 486 valid questionnaires were obtained, resulting in an effective response rate of 97.2%. This article uses SPSS 26.0 and AMOS 24.0 to analyze the collected sample data.

Descriptive Statistics

A total of 486 valid samples were collected in this study, and the demographic charac-teristics of the sample are shown in Table 2. The gender distribution was relatively balanced, with 50.62% male and 49.38% female respondents. Age covered various stages, with the majority being 36–45 years old (22.43%) and 46 years and above (21.40%). Monthly disposable income was concentrated in the ranges of 8,001–10,000 RMB (26.75%) and above 10,001 RMB (21.60%). In terms of online shopping frequency, respondents who shopped 6–10 times per month and more than 10 times per month accounted for the highest proportions (both 28.19%). Overall, the sample exhibited good diversity and representativeness, meeting the requirements for research on omnichannel consumer behavior.

[1] A 5-point Likert scale: Strongly disagree=1; Disagree=2; Neutral=3; Agree=4; Strongly agree=5.

[2] The link of questionnaire webpage : https://v.wjx.cn/vm/QCnVBUM.aspx#

Data Analysis and Hypothesis Testing

Reliability and Validity Testing

This study employed Cronbach's б coefficient to assess the internal consistency reliability of the scales for each latent variable. As shown in Table 3, the overall б values for all latent variables range from 0.768 to 0.882, exceeding the acceptable threshold of 0.7, indicating good reliability of the scales. All item CITC values are above 0.5, and the б coefficients do not increase significantly when any item is removed, suggesting that the design of the measurement items is appropriate and no item deletion is necessary.

Table 4 presents the results of the discriminant validity test for each latent variable obtained from the confirmatory factor analysis. The standardized factor loadings of all observed variables are greater than 0.5, and

Table 2

Sample Characteristics

Variable Name	Option Groups	Number of Cases	Percentage
Gender	Male	246	50.62%
	Female	240	49.38%
Age	18 years and below	95	19.55%
	19–25 years	90	18.52%
	26–35 years	88	18.11%
	36–45 years	109	22.43%
	46 years and above	104	21.4%
Monthly Available Income	3000 RMB and below	66	13.58%
	3001–5000 RMB	105	21.6%
	5001–8000 RMB	80	16.46%
	8001–10000 RMB	130	26.75%
	10001 RMB and above	105	21.6%
Online Shopping Frequency (Monthly)	1–2 times	115	23.66%
	3–5 times	97	19.96%
	6–10 times	137	28.19%
	10 times and above	137	28.19%

Table 3

Cronbach's Alpha Test

Latent Variable	Item	CITC	Alpha After Deleting Item	Overall Alpha	Number of Items
Physical Store	PST1	0.724	0.810	0.858	3
	PST2	0.737	0.797		
	PST3	0.736	0.798		
Staff Service	STF1	0.727	0.729	0.831	3
	STF2	0.651	0.804		
	STF3	0.694	0.762		
Digital Interface	DIT1	0.712	0.804	0.852	3
	DIT2	0.728	0.789		
	DIT3	0.729	0.788		
Privacy & Security	PRS1	0.734	0.539	0.768	3
	PRS2	0.584	0.706		
	PRS3	0.503	0.806		
Seamless Experience	SML1	0.651	0.715	0.798	3
	SML2	0.628	0.738		
	SML3	0.646	0.719		
Perceived Fluency	PFL1	0.742	0.848	0.882	4
	PFL2	0.734	0.852		
	PFL3	0.754	0.844		
	PFL4	0.742	0.848		
Perceived Risk	PRK1	0.677	0.836	0.862	4
	PRK2	0.725	0.817		
	PRK3	0.711	0.822		
	PRK4	0.721	0.818		
Perceived Flexibility	PFX1	0.714	0.836	0.869	4
	PFX2	0.696	0.843		
	PFX3	0.748	0.822		
	PFX4	0.727	0.831		
Delight	DL1	0.678	0.773	0.828	4

Table 4

Results of Confirmatory Factor Analysis and Convergent Validity Test

Latent Variable	Observed Variable	Standardized Factor Loadings	CR	AVE
PRS	PRS1	0.96	0.798	0.580
	PRS2	0.704		
	PRS3	0.568		
PRK	PRK1	0.741	0.862	0.610
	PRK2	0.798		
	PRK3	0.79		
	PRK4	0.793		
DIT	DIT1	0.789	0.853	0.659
	DIT2	0.822		
	DIT3	0.823		
PFL	PFL1	0.801	0.882	0.651
	PFL2	0.798		
	PFL3	0.823		
	PFL4	0.805		

Latent Variable	Observed Variable	Standardized Factor Loadings	CR	AVE
SML	SML1	0.792	0.797	0.568
	SML2	0.724		
	SML3	0.743		
PFX	PFX1	0.786	0.870	0.625
	PFX2	0.761		
	PFX3	0.822		
	PFX4	0.793		
DL	DL1	0.762	0.829	0.549
	DL2	0.735		
	DL3	0.714		
	DL4	0.75		
STF	STF1	0.849	0.832	0.625
	STF2	0.728		
	STF3	0.788		
PST	PST1	0.812	0.859	0.669
	PST2	0.827		
	PST3	0.815		

the composite reliability (CR) values range from 0.797 to 0.882, all exceeding the 0.7 standard, indicating good internal consistency of the scale. The average variance extracted (AVE) is above 0.5, and overall, each latent variable demonstrates good convergent validity and discriminant validity.

To test the discriminant validity of the measurement model, this study uses the Fornell-Larcker criterion for analysis. As shown in Table 5, the square root of the AVE for each latent variable (bolded values on the diagonal) is greater than the correlation coefficients between that variable and others (non-diagonal values), indicating that there is good discriminant validity among the constructs. Based on the results of Table 4 and Table 5, the measurement model in this study meets the acceptable standards for both convergent and discriminant validity, making it suitable for subsequent structural model testing.

Descriptive Statistics of Overall Data Characteristics and Normality Test of Each Measurement Item

Table 6 reports the descriptive statistical results of the latent variables in the study (N=486). All variables were measured using a 5-point Likert scale, with means ranging from 3.537 to 3.938. Among them, the mean of «Pleasure» is the highest (M=3.938), indicating that consumers have a relatively positive emotional response to omnichannel services. On the other hand, the mean of «Perceived

Table 5

Discriminant Validity Test Results (Fornell-Larcker Criterion)

Latent Variable	PST	STF	DIT	PRS	SML	PFL	PRK	PFX	DL
PST	**0.818**								
STF	0.281	**0.791**							
DIT	0.320	0.269	**0.812**						
PRS	0.235	0.194	0.179	**0.762**					
SML	0.232	0.244	0.267	0.103	**0.754**				
PFL	0.275	0.281	0.259	0.083	0.236	**0.807**			
PRK	-0.320	-0.278	-0.247	-0.125	-0.307	-0.314	**0.781**		
PFX	0.331	0.285	0.286	0.152	0.198	0.276	-0.389	**0.791**	
DL	0.418	0.498	0.460	0.261	0.466	0.475	-0.506	0.551	**0.741**

Table 6

Descriptive Statistics of Latent Variables (Dimensions)

Variable	Number of Cases	Minimum Value	Maximum Value	Mean Value	Standard Deviation
Physical Store	486	1	5	3.682	0.975
Staff Service	486	1	5	3.678	0.931
Digital Interface	486	1	5	3.597	0.961
Privacy & Security	486	1	5	3.613	1.019
Seamless Experience	486	1	5	3.587	0.917
Perceived Fluency	486	1	5	3.652	0.895
Perceived Risk	486	1	5	3.537	0.885
Perceived Flexibility	486	1	5	3.68	0.887
Delight	486	1	5	3.938	0.737

Risk» is relatively lower (M=3.537). The standard deviation for each variable ranges from 0.572 to 1.019, showing sufficient variation in the data.

Table 7 further presents the descriptive statistical results of each measurement item. The means of all items range from 3.488 to 3.975 (on a 5-point scale), with standard

Table 7

Descriptive Statistics of Measurement Items and Normality Test

Variable	Mean Value	Standard Deviation	Skewness	Kurtosis
PST1	3.731	1.086	-0.621	-0.252
PST2	3.638	1.099	-0.572	-0.377
PST3	3.679	1.129	-0.664	-0.237
STF1	3.671	1.102	-0.497	-0.47
STF2	3.685	1.052	-0.547	-0.241
STF3	3.679	1.076	-0.597	-0.266
DIT1	3.584	1.105	-0.476	-0.406
DIT2	3.621	1.069	-0.49	-0.384
DIT3	3.584	1.105	-0.448	-0.414
PRS1	3.689	1.184	-0.694	-0.307
PRS2	3.663	1.181	-0.632	-0.386
PRS3	3.488	1.33	-0.6	-0.803
SML1	3.564	1.123	-0.536	-0.386
SML2	3.611	1.053	-0.469	-0.357
SML3	3.586	1.084	-0.495	-0.354
PFL1	3.619	1.054	-0.432	-0.411
PFL2	3.667	1.013	-0.571	-0.112
PFL3	3.671	1.068	-0.515	-0.321
PFL4	3.652	1.034	-0.523	-0.227
PRK1	3.502	1.053	-0.388	-0.47
PRK2	3.535	1.073	-0.436	-0.302
PRK3	3.572	1.048	-0.358	-0.491
PRK4	3.537	1.038	-0.337	-0.479
PFX1	3.71	1.036	-0.48	-0.443
PFX2	3.658	1.045	-0.544	-0.227
PFX3	3.644	1.053	-0.473	-0.405
PFX4	3.708	1.056	-0.47	-0.464
DL1	3.967	0.882	-0.784	0.661
DL2	3.91	0.906	-0.587	0.073
DL3	3.899	0.957	-0.9	0.736
DL4	3.975	0.882	-0.745	0.489

deviations between 0.882 and 1.330. The absolute values of skewness are all less than 1, and the absolute values of kurtosis are all less than 2, indicating that the data distribution of each item generally meets the assumption of normality, making it suitable for subsequent structural equation modeling analysis based on maximum likelihood estimation.

Correlation Analysis of Key Variables

Table 8 presents the Pearson correlation coefficient matrix for the key variables. The analysis shows that consumer pleasure is significantly positively correlated with all five dimensions of omnichannel service quality (r = 0.242 ~ 0.420, p < 0.001), with the strongest correlation found with «Personnel Service». Additionally, pleasure is significantly positively correlated with perceived fluency and perceived flexibility, and significantly negatively correlated with perceived risk, providing preliminary support for the research hypo-theses. All correlation coefficients have absolute values less than 0.7, indicating that there are no severe multicollinearity issues between the variables, making it suitable for inclusion in subsequent structural equation modeling for path testing.

Structural Equation Modeling

Table 9 presents the hypothesis testing results based on the structural equation model, reporting the unstandardized coefficients, standard errors, z-values, p-values, and standardized coefficients for each path. All five dimensions of service quality have a significant positive impact on perceived fluency (â = 0.107–0.153, p < 0.05), with personnel service having the greatest impact (â = 0.153). Hypotheses H1a–H1e are fully supported.

Except for «Privacy and Security», which has an insignificant effect (в = 0.001, p = 0.982), the other four dimensions significantly negatively affect perceived risk (в = -0.094 ~ -0.189, p < 0.05), with physical stores having the strongest reducing effect. Therefore, hypotheses H2a–H2c and H2e are supported, while H2d is not.

All five dimensions significantly positively affect perceived flexibility (â = 0.134–0.186, p < 0.01), with physical stores having the most prominent impact (â = 0.186). Hypotheses H3a–H3e are fully supported.

Perceived fluency (â = 0.260, p < 0.001) and perceived flexibility (â = 0.321, p < 0.001) both significantly positively affect pleasure, supporting hypotheses H4a and H4c. Perceived risk significantly negatively affects pleasure (â = -0.253, p < 0.001), supporting hypothesis H4b.

The impact of «Privacy and Security» on «Perceived Risk» did not pass the significance test (p = 0.982). This may suggest that in the current omnichannel consumption environment, consumers regard privacy and security as basic service thresholds, and their level of

Table 8

Pearson Correlation Analysis Results Matrix

Variable	Delight	Physical Store	Staff Service	Digital Interface	Privacy and Security	Seamless Experience	Perceived Fluency	Perceived Risk	Perceived Flexibility
Delight	1								
Physical Store	0.354***	1							
Staff Service	0.420***	0.236***	1						
Digital Interface	0.385***	0.271***	0.236***	1					
Privacy and Security	0.242***	0.202***	0.166***	0.148**	1				
Seamless Experience	0.374***	0.190***	0.191***	0.217***	0.081	1			
Perceived Fluency	0.407***	0.240***	0.241***	0.225***	0.107*	0.195***	1		
Perceived Risk	-0.431***	-0.278***	-0.232***	-0.214***	-0.087	-0.257***	-0.272***	1	
Perceived Flexibility	0.469***	0.285***	0.244***	0.245***	0.170***	0.164***	0.242***	-0.336***	1

Table 9

Structural Equation Model

Result Variable	Predicted Variable	Estimate	Standard Error	z-value	*p*-value	Standardized Coefficient	Significance
Perceived Flexibility	Physical Store	0.169	0.041	4.119	<0.001	0.186	Significant
Perceived Flexibility	Staff Service	0.136	0.042	3.201	0.001	0.142	Significant
Perceived Flexibility	Digital Interface	0.124	0.042	2.988	0.003	0.134	Significant
Perceived Flexibility	Privacy and Security	0.138	0.039	3.568	<0.001	0.158	Significant
Perceived Flexibility	Seamless Experience	0.146	0.043	3.399	<0.001	0.151	Significant
Perceived Risk	Physical Store	-0.171	0.041	-4.193	<0.001	-0.189	Significant
Perceived Risk	Staff Service	-0.125	0.042	-2.960	0.003	-0.132	Significant
Perceived Risk	Digital Interface	-0.086	0.041	-2.088	0.037	-0.094	Significant
Perceived Risk	Privacy and	0.001	0.038	0.022	0.982	0.001	Not Significant
Perceived Risk	Seamless	-0.169	0.042	-4.015	<0.001	-0.175	Significant
Perceived Fluency	Physical Store	0.133	0.042	3.160	0.002	0.144	Significant
Perceived Fluency	Staff Service	0.147	0.043	3.401	<0.001	0.153	Significant
Perceived Fluency	Digital Interface	0.114	0.042	2.684	0.007	0.122	Significant
Perceived Fluency	Privacy and	0.094	0.040	2.377	0.017	0.107	Significant
Perceived Fluency	Seamless	0.107	0.043	2.467	0.014	0.109	Significant
Delight	Perceived Fluency	0.214	0.031	6.834	<0.001	0.260	Significant
Delight	Perceived Risk	-0.210	0.033	-6.438	<0.001	-0.253	Significant
Delight	Perceived Flexibility	0.267	0.032	8.247	<0.001	0.321	Significant

improvement is insufficient to significantly reduce consumers' perceived risks regarding products, logistics, payment, and other dimensions.

Mediation Effect Testing

This study employed the Bootstrap method (5,000 resamples) to examine the mediating role of consumer perceptions—perceived fluency, perceived risk, and perceived flexibility — in the relationship between service quality and consumer delight. The results are presented in Table 10. The indirect effects of service quality on delight through all three types of consumer perceptions are significant (effect sizes: 0.0758–0.1075, $p < 0.001$), indicating that consumer perceptions play a systematic mediating role in the impact of service quality on delight.

Among the mediators, perceived flexibility shows the strongest mediating effect (effect size = 0.1075, accounting for 14.08%), suggesting that the freedom of choice and switching convenience enabled by omnichannel services constitute a key psychological pathway that fosters delight.

Perceived fluency pathway: Significant mediation is present across all five service-quality dimensions, with effect proportions ranging from 9.93% to 16.15%. Physical stores (16.15%) and personnel service (12.61%) contribute more substantially, indicating that offline touchpoints play a particularly important role in shaping the sense of cross-channel process smoothness.

Perceived risk pathway: Except for the «Privacy and Security» dimension (whose mediating effect is not significant, $p = 0.065$), all other dimensions significantly promote delight by reducing perceived risk, with mediation proportions ranging from 8.97% to 17.80%. This finding aligns with Table 10, in

Table 10

Mediation Effect Test

Path	Effect Value	Effect Ratio	SE	Bias-corrected 95% CI		*P*
				Lower	Upper	
Physical Store → Perceived Fluency → Delight	0.0432	16.15%	0.0112	0.0233	0.0665	<0.001
Physical Store → Perceived Risk – Delight	0.0476	17.80%	0.0111	0.0272	0.0705	<0.001
Physical Store → Perceived Flexibility → Delight	0.0630	23.55%	0.0141	0.0375	0.0936	<0.001
Staff Service → Perceived Fluency → Delight	0.0419	12.61%	0.0109	0.0229	0.0652	<0.001
Staff Service → Perceived Risk → Delight	0.0403	12.12%	0.0103	0.0221	0.0617	<0.001
Staff Service → Perceived Flexibility → Delight	0.0545	16.40%	0.0124	0.0325	0.0816	<0.001
Digital Interface → Perceived Fluency → Delight	0.0392	13.26%	0.0109	0.0207	0.0621	<0.001
Digital Interface → Perceived Risk → Delight	0.0374	12.66%	0.0098	0.0199	0.0577	<0.001
Digital Interface → Perceived Flexibility → Delight	0.0534	18.07%	0.0123	0.0312	0.0796	<0.001
Privacy and Security → Perceived Fluency → Delight	0.0194	11.08%	0.0094	0.0030	0.0392	0.018
Privacy and Security → Perceived Risk → Delight	0.0157	8.97%	0.0094	-0.0009	0.0355	0.065
Privacy and Security → Perceived Flexibility → Delight	0.0369	21.08%	0.0115	0.0157	0.0609	<0.001
Seamless Experience → Perceived Fluency → Delight	0.0363	12.09%	0.0110	0.0170	0.0606	<0.001
Seamless Experience → Perceived Risk → Delight	0.0428	14.26%	0.0103	0.0240	0.0643	<0.001
Seamless Experience → Perceived Flexibility → Delight	0.0402	13.39%	0.0127	0.0168	0.0667	<0.001

which the «privacy and assurance → perceived risk» path is also nonsignificant.

Perceived flexibility pathway: All service-quality dimensions exert significant mediating effects through perceived flexibility. Notably, the mediating effect of privacy and assurance through flexibility accounts for the highest proportion (21.08%), suggesting that security assurance enhances delight not primarily by reducing risk, but by strengthening consumers' sense of control and freedom in channel usage.

Results Analysis and Recommendations

Results Analysis

This study tested all 18 proposed hypotheses, and the results are summarized in Table 11. Among them, 17 hypotheses were supported by the data, indicating that the four dimensions of omnichannel service quality — physical stores, personnel service, digital interface, and seamless experience—can significantly enhance perceived fluency and perceived flexibility, reduce perceived risk, and that all three forms of perception significantly influence consumer delight.

The only unsupported hypothesis is H2d («Privacy and assurance have a significant negative effect on perceived risk»). This suggests that in an omnichannel environment, the psychological mechanism through which privacy and security measures operate may involve more complex pathways.

Overall, the hypothesis testing results clearly reveal the complex mechanism by which omnichannel service quality influences consumer delight by shaping multiple dimensions of consumer perception. These findings provide strong empirical support for the core research model.

Table 11

Summary of Hypothesis Testing Results

Hypothesis Code	Hypothesis Path	Test Results
H1a	Physical stores have a significant positive effect on perceived fluency.	Supported
H1b	Staff service has a significant positive effect on perceived fluency.	Supported
H1c	Digital interface has a significant positive effect on perceived fluency.	Supported
H1d	Privacy and security have a significant positive effect on perceived fluency.	Supported
H1e	Seamless experience has a significant positive effect on perceived fluency.	Supported
H2a	Physical stores have a significant negative effect on perceived risk.	Supported
H2b	Staff service has a significant negative effect on perceived risk.	Supported
H2c	Digital interface has a significant negative effect on perceived risk.	Supported
H2d	Privacy and security have a significant negative effect on perceived risk.	**Not Supported**
H2e	Seamless experience has a significant negative effect on perceived risk.	Supported
H3a	Physical stores have a significant positive effect on perceived flexibility.	Supported
H3b	Staff service has a significant positive effect on perceived flexibility.	Supported
H3c	Digital interface has a significant positive effect on perceived flexibility.	Supported
H3d	Privacy and security have a significant positive effect on perceived flexibility.	Supported
H3e	Seamless experience has a significant positive effect on perceived flexibility.	Supported
H4a	Perceived fluency has a significant positive effect on consumer delight.	Supported
H4b	Perceived risk has a significant negative effect on consumer delight.	Supported
H4c	Perceived flexibility has a significant positive effect on consumer delight.	Supported

Recommendations

1) Maintain Consistency of Information and Processes Across Channels.

Firms can establish an order management system centered on Standard Operating Procedures (SOPs). On the one hand, they should continuously integrate new technologies into supply chain operations to track orders and inventory, synchronize order information across all available channels through multiple nodes, and provide customers with real-time and accurate responses to ensure consistency. This also supports the coordinated com-munication of promotions and brand image. On the other hand, firms should supervise service processes across channels to ensure that service personnel operate in accordance with SOPs.

It is important to note that while maintaining consistency of information and processes across channels, complete uniformity in product assortments and pricing may not always be achievable, as certain exclusive products may be offered in specific channels. Therefore, firms should meet the needs of their primary target consumers in each channel: while ensuring consistency in core product categories across channels, they may introduce channel-specific items tailored to the dominant consumer group of that channel. Cross-channel coordination should aim to maximize overall efficiency and benefits.

2) Implement Differentiated Marketing Activities Across Channels and Strengthen Customer Interaction.

One prerequisite for allowing customers to move freely across different touchpoints in an omnichannel system is helping them clearly understand the functional differences across channels. Firms may encourage customers to actively engage with omnichannel services so that they can experience the unique features and service functions of each channel. For example, in physical stores, employees can recommend online services such as official websites, mobile apps, and social media accounts. Meanwhile, online product pages should update store locations and inventory information in real time and promote hybrid services such as BOPS (Buy Online, Pick Up in Store).

Through these shopping experiences, customers can better perceive the characteristics and distinctions of each channel, enabling seamless switching and smooth execution of tasks across channels.

3) Provide a Wide Range of Available and Alternative Channels to Fulfill Customer Needs.

Omnichannel service requires continuous improvement of online–offline coordination, optimizing channel management to provide customers with a seamless, consistent, and unified shopping experience. Specifically, firms

may connect various touchpoints to achieve coordinated promotion. Offline stores can promote online stores through QR codes on packaging, brochures, and posters; online stores can highlight physical store information on their homepages and product pages to strengthen cross-channel traffic flow.

Customer order databases should be centrally managed, and customer service across online and offline channels should be coordinated to ensure that customers' rights regarding pre-purchase consultation, payment, and after-sales services (returns, exchanges, repairs) can be fulfilled in all channels. Furthermore, integrating online and offline customer profiles enables more accurate personalization, enhancing customers' emotional experience.

4) Enable Functional Complementarity Across Channels.

In addition to coordinating and expanding online and offline channels, firms must optimize the configuration and combination of channel functions. Offline channels should support online order fulfillment by providing in-store pickup services, while physical stores should also allow online reservations to enable customers to complete purchase tasks smoothly based on personal preference. Likewise, offline stores can extend experiential services for online shoppers by offering product try-outs or consultations, improving pre-purchase engagement.

Unified standards for returns and exchanges across online and offline channels should be implemented to enhance the post-purchase service experience.

Conclusion

Drawing on a comprehensive review of the omnichannel service literature, this study proposed research hypotheses related to firms' channel service quality and developed a theoretical model encompassing channel service quality, consumer perceptions, and consumer delight. Based on empirical analysis of survey data, the results indicate that the five dimensions of omnichannel service quality are positively associated with consumer delight, and that the three dimensions of consumer perception serve as mediators between omnichannel service quality and consumer delight.

This study offers practical recommendations for enhancing firms' channel service quality. Future research may focus on the following directions:

1. With the rapid development of omnichannel retailing, firms continue to introduce new omnichannel services and adjust their integration strategies. Future studies can expand upon the framework of this research by identifying and incorporating emerging omnichannel service features and evaluating their effectiveness.

2. Although this study confirms that perceived fluency is a crucial component of customer experience and an outcome of channel integration quality, other important factors—such as perceived usefulness — were not included in the model. Future research could adopt a more multidimensional approach to assess customers' responses to channel integration quality.

3. This study focuses on the influence of channel service quality on consumers' willingness to use omnichannel services. Future research could explore other important outcomes of service quality, such as consumers' continued use intentions, customer stickiness, and customer loyalty.

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КАК КАЧЕСТВО МНОГОКАНАЛЬНЫХ КОММУНИКАЦИЙ СПОСОБСТВУЕТ УДОВЛЕТВОРЕНИЮ ПОТРЕБИТЕЛЕЙ?

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Аннотация. Развитие мобильного интернета обеспечило возможность оперативной интеграции онлайн- и офлайн-каналов, что сделало омниканальную модель современным и популярным маркетинговым подходом. Опираясь на теоретическую рамку «стимул – организм – реакция» (S–O–R), в данном исследовании анализируется, каким образом качество омниканального сервиса стимулирует потребительское удовольствие. На основе анкетного опроса и эмпирического анализа данных 486 потребителей в качестве независимых переменных рассматриваются пять измерений качества сервиса: физические магазины, обслуживание персоналом, цифровой интерфейс, конфиденциальность и безопасность, а также бесшовный опыт. В качестве медиаторных переменных выделяются три измерения потребительского восприятия: воспринимаемая плавность, воспринимаемая гибкость и воспринимаемый риск, тогда как потребительское удовольствие выступает зависимой переменной. Полученные результаты предоставляют практические рекомендации для компаний, стремящихся оптимизировать омниканальный сервисный опыт и повысить уровень потребительского удовольствия.

Ключевые слова: омниканальность, качество сервиса, потребительское восприятие, потребительское удовольствие, эмпирическое исследование.

JEL-классификация: M31, D12.

DOI: 10.46782/1818-4510-2026-1-136-153

Материал поступил 16.12.2025 г.

Для цитирования: Сун Чжэни. 2026. Как качество многоканальных коммуникаций способствует удовлетворению потребителей? *Белорусский экономический журнал*. № 1. С. 136–153. DOI: 10.46782/1818-4510-2026-1-136-153