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Exploring the Sustainable Usage Intention of BOPS: A Perspective of Channel Integration Quality

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Abstract: BOPS (Buy Online, Pick up in Store) is a popular channel strategy that plays an important role in promoting the sustainable development of omni-channel retailing. Focusing on consumer's sustainable usage intention of BOPS service, this paper uses a Technology Acceptance Mode (TAM) framework to investigate how the channel integration quality influences the willingness to adopt BOPS service from four dimensions: channel service transparency, channel choice breadth, content consistency, and process consistency. Our findings support previous research in the TAM field, as perceived usefulness and perceived ease of use strongly affect consumer's favorable attitude towards BOPS service. The pivotal roles of channel service transparency and process consistency in the formation of BOPS using intention is verified, as they both have positive effect on perceived usefulness and perceived ease of use. However, channel choice breadth indirectly affects the sustainable usage intention of BOPS through perceived usefulness but has no significant effect on perceived usefulness. In addition, content consistency positively affects perceived ease of use, but the diversity of channels does not necessarily make consumers find BOPS more useful. On this basis, the implications of BOPS service management are discussed.



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Keywords: channel integration quality; BOPS; sustainable usage intention; technology acceptance mode

1. Introduction

To promote business sustainability, retailers are embracing an omni-channel strategy as a priority for business development. Omni-channel aims to provide consumers with a consistent cross-channel shopping experience by coordinating decentralized service processes and technologies across channels [1,2]. BOPS is actually an omni-channel strategy commonly adopted by retailers today. Sales revenue from BOPS channel increased by an average of 35% during the 2019 holiday season. Further, the development of BOPS has been accelerated since the restrictions and lockdowns during the global pandemic in recent years have pushed more retailers to adopt a BOPS strategy. An omni-channel report released by Digital Commerce 360 shows that by the beginning of 2021, 68.7% of the U.S. retailers had offered a BOPS service [3]. For omni-channel retailers, the BOPS strategy can reduce the risk of single-channel sales and improve the chances of product sales as it is a hybrid channel strategy that can fill the gap between exclusively shopping in the brick-and-mortar store and ordering online for delivery [4]. On the other hand, BOPS is the perfect way to increase in-store customer flow, which may significantly lead to sustainable growth in brick-and-mortar store sales. For the customers, they can place orders anytime and anywhere online and choose to go to the nearest store or pickup location once the order is ready. With BOPS, customers do not have to deal with additional shipping cost and long delivery time and can return and quickly exchange the items that do not meet their expectation, which helps to promote sustainable satisfaction throughout the shopping process [5]. The BOPS strategy has played a key role not only in promoting sustainable growth in sales, but also in improving the sustainable satisfaction of consumers [6]. Therefore, from the perspective of consumers, exploring and enhancing consumers' sustainable usage intention of BOPS is

of great significance to the long-term sustainable development of the BOPS strategy and omni-channel retailing.

BOPS can be regarded as a new service system with both software (e.g., joint inventory management software; joint financial management software) and supporting establishment (e.g., pickup tower of Wal-Mart; pickup station of JD store) from the perspective of consumers. In the field of information system, sustainable usage intention usually means the people's continuous willingness to use a certain technology or system. For example, in the context of e-commerce, Lin et al. [7] conducted a study on consumer's sustainable usage intention of mobile payment technology. In the field of public administration, Si et al. [8] explored the public's continuous usage intention of bike-sharing systems. In this paper, we will focus on consumer's sustainable usage intention of BOPS. When studying user acceptance or using intention, the Technology Acceptance Model (TAM) proposed by Davis is one of the most mature research theories. In addition, the characteristics of the system itself are often considered to be an important factor affecting the willingness to use the system [9,10]. Hence, for BOPS, an online and offline collaborative information service system, the quality of cross-channel integration between online and offline channels is believed to have a key impact on the user experience with the system.

However, previous papers have not paid enough attention to this research direction. As far as we know, few papers have introduced the TAM to study whether channel integration quality has an impact on the sustainable usage intention of BOPS through perceived usefulness and perceived ease of use. Hence, this paper aims to create an appropriate theoretical framework for continuous BOPS usage based on TAM, which can help to identify the ways in which omni-channel retailers can promote the sustainable development of BOPS.

This paper is organized as follows: Section 2 puts forward the research model and hypotheses based on TAM. Section 3 details the design of the scale and the collection of data. Section 4 examines the measurement model and explains the hypotheses testing results. The research findings and implications from the perspectives of BOPS business management are discussed in Section 5. Section 6 summarizes the main findings, the contributions of this paper, and the limitations and possible future research directions.

2. Theoretical Background and Research Model

2.1. Technology Acceptance Mode (TAM)

In 1989, Davis adapted the Theory of Reasoned Action (TRA) by Ajzen and Fishbein [11] to obtain the Technical Acceptance Model to describe the user's acceptance of information technology. The theoretical model believes that behavior intention is mainly affected by user's positive or negative attitude towards using the information system. Furthermore, perceived usefulness and perceived ease of use are the two key factors that determine user's attitude [12].

Perceived usefulness mainly describes the user's subjective feelings about the utility of a certain technology or system, that is, the degree to which users believe that the information system helps them improve work efficiency [13]. In the context of BOPS service, consumer's perceived usefulness refers to the utility value that consumers perceive in the process of using BOPS services. For example, "buy online" may allow consumers to enjoy lower prices, and "pick up in store" saves consumers the time and cost of waiting for express delivery. BOPS service can help consumers make comprehensive use of online and offline channel advantages, optimize shopping decisions, and maximize their own utility [14]. Therefore, the higher the consumer's perceived usefulness, the more likely they are to use the BOPS service system. Based on the above analysis, the following hypothesis is proposed:

H1: *Consumers' perceived usefulness has a positive impact on the sustainable usage intention of BOPS.*

In the TAM theory, perceived ease of use reflects how easy it is for users to use a certain information system. Previous studies have shown that perceived ease of use can significantly affect users' satisfaction, loyalty, and the willingness to accept a certain shopping model [12,15]. In the BOPS scenario, perceived ease of use refers to consumers' belief that using BOPS services will not cost them much effort. The world-renowned clothing brand Uniqlo is a pioneer in providing BOPS services, and its BOPS channel has a high visibility among consumers. In the 2016 Double Eleven Online Shopping Carnival, Uniqlo officially offered the BOPS services in China, which was warmly welcomed by customers and significantly increased sales in that year [16,17]. When consumers place an order in the Uniqlo online store, the order page clearly provides two selection buttons of "delivered by express" and "pick up in store" for customers to choose. If the customer chooses to "pick up in store", the website will automatically provide a list of stores with stock available for pick-up based on the location information. In addition, the list will also display the distance information, the specific address information and the opening hours information of the store, which greatly improves the shopping efficiency of consumers. Therefore, it is reasonable to assume the following:

H2: *Consumers' perceived ease of use has a positive impact on the sustainable usage intention of BOPS.*

2.2. Channel Integration Quality

The quality of channel integration is considered to be the degree to which a retailer aligns the targeting, design, and deployment of its channels in order to create synergies for the company and provide specific advantages to its customers [18,19]. It refers to the ability of retailers to provide consumers with a continuous, unified, complete and seamless shopping experience across different channels [20]. Wu and Chang [21] find that improving the quality of multi-channel integration can increase the perceived value of consumers, thereby enhancing consumers' willingness to buy. High-quality channel integration can not only effectively improve consumer satisfaction and loyalty, but also help retailers rationally allocate channel resources, reduce channel operating costs, and improve corporate competitiveness [22–24].

The integration of online and offline channels is not a simple $1 + 1 = 2$ problem; more emphasis is placed on flexible and collaborative management between the two channels. In other words, both high-level services of online channel and offline channel may not necessarily be integrated into an efficient working system. For example, if the product information obtained through consultation in a physical store is inconsistent with the same product information displayed in an online store website, it is likely to cause confusion among consumers, which will lead to a negative impact on BOPS, even if the offline sales people are friendly and the online product information is clear and specific. Sousa and Voss [20] put forward the concept of channel integration quality, which is widely used to study the effect of channel integration quality on consumer satisfaction and purchase intention. They believe that channel integration quality includes two aspects: service configuration quality and integrated interaction quality. More in-depth, service configuration quality covers two dimensions of channel service transparency and channel choice breadth, and integrated interaction quality can be reflected in both content consistency and process consistency. We will describe these four dimensions separately in the following part.

2.2.1. Channel Service Transparency

Channel service transparency represents the extent to which consumers are aware of all available channel properties. Specifically, it refers to whether consumers are aware of the existence of all available channels and whether they understand the difference in service attributes between different channels [25]. In a real shopping scene, the online stores of some retailers are not so well-known that consumers do not know they can purchase through the online channel. Furthermore, not every consumer has an in-depth understanding of the large differences between services provided by online and offline channels, such as the product prices, customer service response time, and delivery time. These differences may directly affect consumers' purchasing decisions [26]. If the level of channel service transparency is high, consumers know the existence of all available channels and have a full understanding of their pros and cons. It is conceivable that they are more likely to discover the usefulness and convenience of BOPS. Conversely, if the level of channel service transparency is low, and consumers do not even know the existence of online channel, then consumers will not have the opportunity to explore the good features of BOPS. Based on the above analysis, we propose the following hypotheses:

H3: *Channel service transparency has a positive impact on consumers' perceived usefulness.*

H4: *Channel service transparency has a positive impact on consumers' perceived ease of use.*

2.2.2. Channel Choice Breadth

Channel choice breadth refers to the degree to which consumers can freely choose to obtain product information or service from online or offline channel to meet their needs [1]. In other words, the wider the channel choice breadth, the more freedom consumers have to choose their preferred channels to complete their shopping behavior. For example, compared with e-commerce companies that only accept phone orders or online orders, multi-channel retailers that can accept phone orders and online orders at the same time show better channel service configurations. Therefore, channel choice breadth is an important factor in promoting consumer participation [21]. When channel choice breadth is wide enough, customers have the flexibility to choose their preferred or familiar channel for shopping. However, when consumers have only one shopping channel to choose from, they may be at their wits' end if they run into trouble while shopping. Consumers can easily have a positive emotional experience during the shopping journey by freely switching between the available channels [27]. Therefore, they may be more willing to explore and compare the pros and cons of various channels. In this scenario, the unique advantages of BOPS service may be easier for consumers to discover. On the other hand, the high-level channel choice breadth means that the channels are highly interconnected and integrated, which will inevitably make consumers feel that the channels are more smooth to use, thus reducing the difficulty of using BOPS service. Li et al. [2] also believes that consumers can benefit from the combination of alternative channels as it enhances the consumer's overall cognitive experience of the product. Based on this, the following hypotheses are proposed:

H5: *Channel choice breadth has a positive impact on consumers' perceived usefulness.*

H6: *Channel choice breadth has a positive impact on consumers' perceived ease of use.*

2.2.3. Content Consistency

Content consistency refers to the degree of consistency of the product information obtained by consumers from different channels. It reflects the level of collaboration between online and offline channels in terms of product information, order fulfillment, and customer service. Cross-channel integration is committed to providing consumers with a consistent consumer service experience, so content consistency is an objective requirement for channel integration. It requires cross-channel retailers to use IT to keep synchronized

product information released in different channels, such as product attribute information, promotion information, and inventory information. For example, big data technology can be adopted to achieve information sharing, which helps eliminate information asymmetry resulting from poor visibility and transparency [28,29]. This is also a key factor in enhancing consumers' trust in cross-channel retailers [30,31]. If consumers receive different consultation feedback from online and offline channels, it will inevitably cause consumers' doubts, which will reduce their trust and loyalty to retailers, and thus have a negative attitude towards the usefulness of BOPS services. Conversely, a higher level of content consistency can help consumers better understand product information, especially inventory and promotion information, ensuring a transparent flow of information between retailing channels and reducing consumer confusion due to inconsistent information [32]. The more consistent content an omnichannel retailer can deliver, the more likely it will help reduce customer skepticism and confusion, and ultimately shorten the time it takes for consumers to make a purchase decision [33]. Therefore, there is reason to believe that content consistency can help consumers perceive the ease of BOPS service using, build positive shopping confidence, and improve consumers' perceived ease of use. Based on this, we propose the following assumptions:

H7: *Content consistency has a positive impact on consumers' perceived usefulness.*

H8: *Content consistency has a positive impact on consumers' perceived ease of use.*

2.2.4. Process Consistency

Process consistency requires the consistency of similar or comparable process attributes in different channels. Comparable process attributes of online and offline channels include the response time of the service, the decision-making level of the service staff, the service performance, and so on [20]. It has been proven that process consistency, such as visual consistency, is a key part of a seamless experience for consumers [33,34]. The higher the consistency of the process, the better the uniformity, reliability and stability of channel integration, which may directly improve the fluency of consumers using BOPS services, improve the efficiency of BOPS services, and enhance consumers' perceived usefulness. On the other hand, it will also reduce the difficulty for consumers to use BOPS services. Consequently, the following hypotheses are proposed:

H9: *Process consistency has a positive impact on consumers' perceived usefulness.*

H10: *Process consistency has a positive impact on consumers' perceived ease of use.*

2.3. Research Model

This study uses TAM as a basic conceptual framework, constructs a model of the influencing factors of BOPS use intention from the perspective of channel integration quality. Figure 1 shows that there are seven key variables in the research model, among them, we assume the four dimensions of channel integration quality as antecedent variables, perceived usefulness and perceived ease of use as intermediate variables, and BOPS using intention as dependent variable. The specific aspects of the research model and the hypotheses are discussed in the following part.

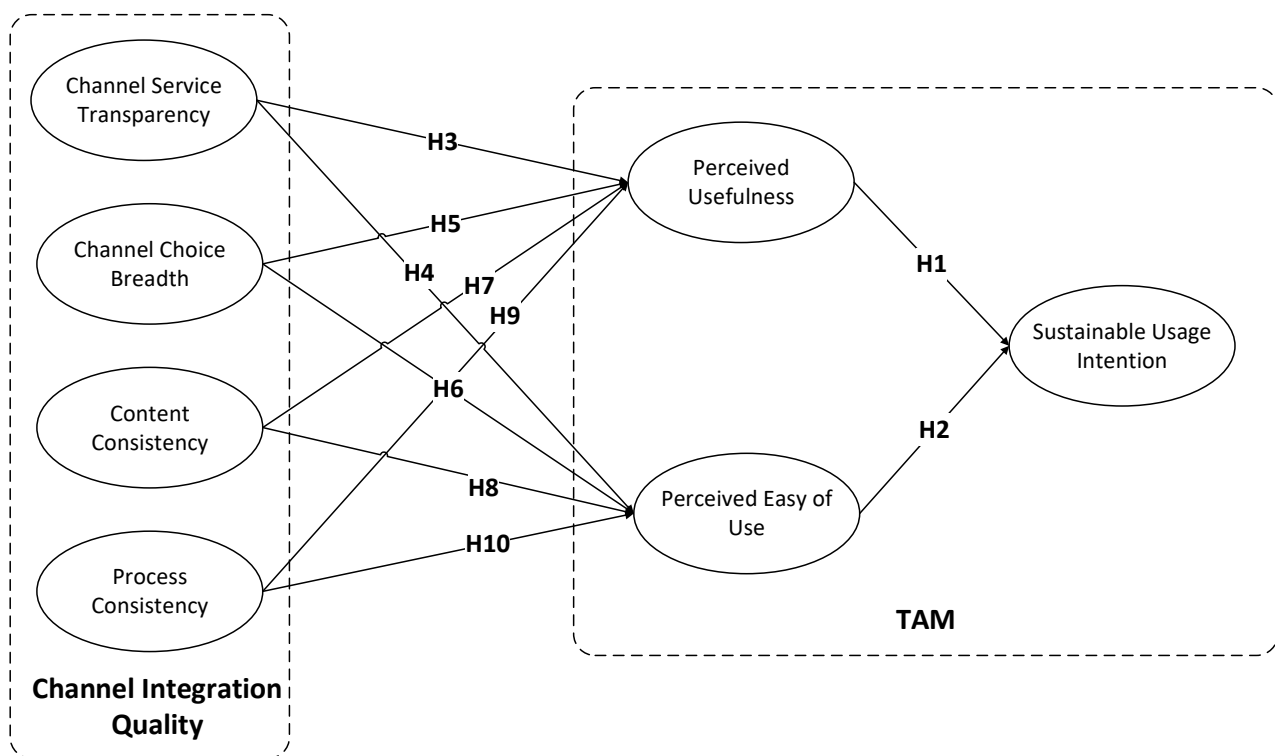


Figure 1. Proposed model.

3. Method

3.1. Measurement Development

This paper adopts the method of questionnaire survey to obtain the data, and the measurement of variables is mainly based on the mature scale of the relevant literature and revised based on the realistic background of BOPS service. We develop the questionnaire through the following series of steps. First, we review the previous literature to identify validated measures, and make appropriate modifications of the questions to fit the realistic background of BOPS service. Second, five professors with rich experience in scale design are invited to modify the items to make them more in line with the BOPS shopping context and questionnaire design specifications. Third, we conduct a pre-test questionnaire with 40 customers with rich BOPS using experience, analyze the experimental results, and gradually improve the details of the questionnaire.

The 18 items in this paper are all measured by Likert's 5-point scales ranging from 1 to 5. Twelve items are adopted from Shen et al. [1] and Shi et al. [35] to measure channel integration quality, including three items for channel service transparency, three items for channel choice breadth, three items for content consistency and three items for process consistency. Perceived usefulness and perceived ease of use are measured with four items adopted from Pavlou and Fygenson [36]. Finally, based on Li and Shang [37], two items are used to measure the sustainable usage intention of BOPS. Table 1 presents the items in detail.

Table 1. Research constructs and operationalization.

Latent Variable	Items	Constructs
Channel Service Transparency (Shen et al. [1]; Shi et al. [35])	CST1	I am aware of the existence of all available service channels.
	CST2	I am aware of the differences between service attributes across different channels.
	CST3	I know how to utilize different channels to meet my consumption needs.
Channel Choice Breadth (Shen et al. [1]; Shi et al. [35])	CCB1	I can choose alternative channels for a given service.
	CCB2	I can accomplish preferred tasks through individual channels.
	CCB3	Regardless of the channel I choose, I can use other channels to get information or help.
Content Consistency (Shen et al. [1]; Shi et al. [35])	CC1	I receive the same response through different channels.
	CC2	When I interact with one channel, my interactions with other channels are always taken into account.
	CC3	The information is consistent across different channels.
Process Consistency (Shen et al. [1]; Shi et al. [35])	PC1	The service performance is consistent across different channels.
	PC2	The service feelings are consistent across different channels.
	PC3	The service images are consistent across different channels.
Perceived Usefulness (Pavlou & Fygenon [36])	PU1	BPOS service would be useful in purchasing.
	PU2	Using BPOS service would enhance my effectiveness in purchasing.
Perceived Ease of Use (Pavlou & Fygenon [36])	PEU1	My interaction with BPOS would be clear and understandable.
	PEU2	Learning to use BPOS service would be easy for me.
Sustainable Usage Intention (Li & Shang [37])	SUI1	I intend to keep using BPOS service in the future.
	SUI2	I intend to recommend my friends to use BPOS service in the future.

3.2. Data Collection

We used Sojump, a famous online survey website in China, to collect the data. At first, a filter question was set up to weed out people with no BOPS using experience to ensure that only BOPS experienced consumers are surveyed. The process yielded a total of valid 284 responses after eliminating 21 responses for which answers had failed to meet some basic requirement, such as highly similar answers without logic, contradictory answers on forward and reverse items, too short a time to answer questions. The detail information of the sample profile is shown in Table 2.

Table 2. Demographic statistics (N = 284).

Demographics	Frequency	Percentage (%)
Gender		
Male	125	44.01
Female	159	55.99
Age		
<20	15	5.28
20–25	110	38.73
26–30	78	27.46
31–40	64	22.54
>40	17	5.90

Table 2. Cont.

Demographics	Frequency	Percentage (%)
Education level		
High school and below	3	1.06
College/university	135	47.54
Master and above	146	51.41
Purchase amount per month		
0–1000 yuan	75	26.41
1001–3000 yuan	118	41.55
3001–5000 yuan	54	19.01
5001–10,000 yuan	21	7.39
>10,000 yuan	16	5.63

4. Data Analysis and Results

The Structural Equation Modeling (SEM) is one of the most widely used empirical research methods in psychology and marketing fields because of its excellent performance to analyze direct and indirect relationships between constructs of complex models. Therefore, SEM is employed to examine the proposed relationship and research model in this paper [38,39]. Specifically, we use Smart PLS 3.0, a statistical analysis software widely used in modeling studies with formative structures, to test the proposed hypotheses and conceptual model. The measurement consists of two parts: the test of the measurement model and the test of the structural model. Specifically, we first test the reliability and validity of the measurement model. On the premise that the measurement model is qualified, we evaluate the structural model to verify the significance level the hypotheses and draw the theoretical explanatory power of the proposed TAM model.

4.1. Test of Measurement Model

According to Henseler et al. [40], when the estimates of the three indicators, the factorial loading, Cronbach's Alpha, composite reliability (CR) are all above the required threshold of 0.7, which implicates that the measurement model has a good reliability. The result of Table 3 indicates that factorial loading values range from 0.749 to 0.963, Cronbach's Alpha values range from 0.705 to 0.914, and CR values range from 0.835 to 0.958. These values all exceed the recommended benchmark value of 0.7.

We then conduct the convergent validity test for the measurement model. It is recommended that the AVE values should be greater than the benchmark value of 0.5. The results in Table 3 show that the AVE values are all reaching the required threshold of 0.5, ranging from 0.629 to 0.919. That indicates the scale has good convergent validity. Furthermore, according to Fornell and Larcker [41], the discriminant validity, which represents the extent to which a construct is truly different from other constructs, requires that the square root of AVE value should be greater than its inter-construct correlation coefficients. From the correlation matrix in Table 4, we can see that the square root of the AVE value for each latent construct is greater than the corresponding correlation coefficients. Therefore, a qualified discriminant validity is showed in this measurement model.

Table 3. Results of confirmatory factor analysis (CFA).

Construct	Items	Factorial Loading	Cronbach's α	CR	AVE
Channel Service Transparency	CST1	0.788	0.705	0.835	0.629
	CST2	0.758			
	CST3	0.831			
Channel Choice Breadth	CCB1	0.857	0.755	0.859	0.671
	CCB2	0.847			
	CCB3	0.749			
Content Consistency	CC1	0.848	0.746	0.854	0.661
	CC2	0.776			
	CC3	0.813			
Process Consistency	PC1	0.922	0.914	0.946	0.854
	PC2	0.937			
	PC3	0.913			
Perceived Usefulness	PU1	0.939	0.866	0.937	0.882
	PU2	0.940			
Perceived Ease of Use	PEU1	0.904	0.723	0.878	0.782
	PEU2	0.864			
Sustainable Usage Intention	SUI1	0.963	0.912	0.958	0.919
	SUI2	0.953			

Table 4. Inter-construct correlation matrix.

	Mean	S.D.	CST	CCB	CC	PC	PU	PEU	SUI
CST	4.231	0.755	0.793						
CCB	4.425	0.811	0.387	0.819					
CC	3.996	0.804	0.365	0.434	0.813				
PC	3.198	1.162	0.287	0.323	0.583	0.924			
PU	4.194	0.955	0.422	0.277	0.478	0.389	0.939		
PEU	4.310	0.856	0.489	0.535	0.431	0.392	0.568	0.884	
SUI	4.115	0.867	0.444	0.420	0.499	0.462	0.697	0.624	0.958

Note: CST = Channel Service Transparency; CCB = Channel Choice Breadth; CC = Content Consistency; PC = Process Consistency; PU = Perceived Usefulness; PEU = Perceived Ease of Use; SUI = Sustainable Usage Intention.

In addition, we conduct a multicollinearity test to further test the reliability of this scale. According to Hair et al. [42], a multicollinearity problem exists if the variance inflation factors (VIFs) are greater than the threshold of 10. The results in Table 5 show that the VIF values ranged from 1.253 to 1.735 and are lower than a more stringent threshold of 3, which implies that the multicollinearity problem is not considered a threat in this study.

Table 5. Results of multicollinearity test.

	PU	PEU	SUI
CST	1.253	1.253	—
CCB	1.338	1.338	—
CC	1.735	1.735	—
PC	1.537	1.537	—
PU	—	—	1.476
PEU	—	—	1.476

4.2. Test of Structure Model

We test the structure model, and the results of the data analysis are summarized in Table 6 and Figure 2. On the whole, 8 out of 10 hypotheses are supported by the data. The results show that BOPS using intention is positively affected by perceived usefulness and perceived ease of use, and the proportions of variances explained are 50.6% ($t = 6.133$) for perceived usefulness, and 33.7% ($t = 8.507$) for perceived ease of use. Thus Hypothesis 1 and Hypothesis 2 are supported. As expected, channel service transparency has a positive and significant impact on perceived usefulness and perceived ease of use, with path coefficient at 0.275 ($t = 4.395$) and 0.281 ($t = 5.206$), supporting Hypothesis 3 and Hypothesis 4. The positive effect of channel choice breadth on perceived ease of use confirms Hypothesis 6 ($\beta = 0.337$, $t = 5.705$), while the significant effects of channel choice breadth on perceived usefulness (Hypothesis 5) is not verified. Results show that content consistency relates positively to perceived usefulness ($\beta = 0.300$; $t = 3.784$), which substantiates Hypothesis 7, whereas the positive effect of content consistency on perceived ease of use (Hypothesis 8) is not confirmed. Results indicate that process consistency positively affect attitude towards perceived usefulness ($\beta = 0.137$; $t = 1.989$) and perceived ease of use ($\beta = 0.145$; $t = 2.374$), respectively. Therefore, Hypothesis 9 and Hypothesis 10 are supported.

Table 6. Results of hypotheses test (Note: * $p < 0.05$, *** $p < 0.001$).

Hypotheses	Path	Path Coefficient	t-Value	Result
H1	PU→SUI	0.506 ***	6.133	supported
H2	PEU→SUI	0.337 ***	8.507	supported
H3	CST→PU	0.275 ***	4.395	supported
H4	CST→PEU	0.281 ***	5.206	supported
H5	CCB→PU	−0.004	0.064	unsupported
H6	CCB→PEU	0.337 ***	5.705	supported
H7	CC→PU	0.300 ***	3.784	supported
H8	CC→PEU	0.098	1.406	unsupported
H9	PC→PU	0.137 *	1.989	supported
H10	PC→PEU	0.145 *	2.374	supported

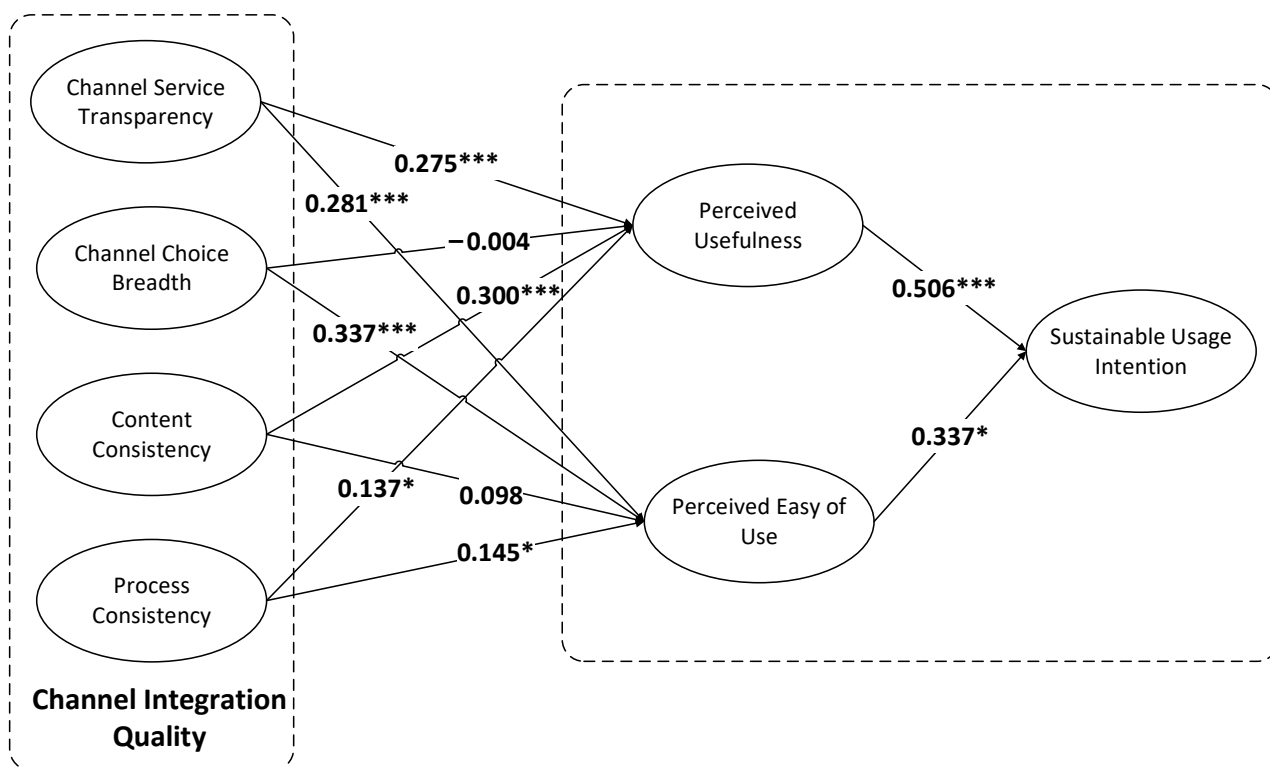


Figure 2. Results of structural model analysis. Note: * $p < 0.05$, *** $p < 0.001$.

We employ bootstrapping procedures to further examine the significance of the hypothesis. The analytical result shows that the 95% confidence interval (CI) does not include zero at the 0.05 level, which verifies the significance of the corresponding hypothesis.

5. Discussion and Implications

5.1. Discussion

The goal of the paper is to apply TAM to explore the influence of channel integration quality on people's sustainable usage intention of BOPS. The main findings are discussed below. Firstly, we examine the role of perceived usefulness and perceived ease of use in influencing consumers' willingness to adopt BOPS channel. The results indicate that perceived usefulness and perceived ease of use have significant positive effects on the sustainable using intention. That is to say, when consumers perceive that BOPS channel can help them improve shopping efficiency and satisfaction, they are more likely to adopt it. This finding is also consistent with the fact that consumers are always concerned about the characteristic advantage of the purchase channel, and high channel integration quality can help consumers to achieve the desired shopping effect and improve the satisfaction of their purchase [43,44]. In addition, the more consumers find BOPS service as convenient to use, the more likely they are to further visit and explore the BOPS channel. It supports that perceived ease of use remains important in the formation of shopping channel adoption intent [5].

Secondly, the result shows that channel service transparency has significant positive influence on both perceived usefulness and perceived ease of use. That means the more transparent the information about the available channels, the more useful the BOPS system will be to consumers. Additionally, with the clear information about available channels, it is getting easier for consumers to use BOPS. With a high level of channel service transparency, consumers can explore the advantages and disadvantages of each channel, and easily collect the information they need, effectively reducing the information asymmetry consumers perceive [45].

Thirdly, channel choice breadth has a significant positive impact on perceived ease of use but has no significant impact on perceived usefulness. The empirical results prove that the more channels consumers can choose, the easier consumers can use channels to satisfy their shopping tasks. Enough channel selection provides customers with the freedom to pick up different channels in different stages (e.g., purchase stage, payment stage). For example, consumers search for products through the website, because it is convenient and flexible to browse products on the web, and then go to the B&M store to buy, because they want to experience the product physically. Thus, it strengthens their self-control and creates a sense of security [46,47]. However, the diversity of channels does not necessarily make consumers find BOPS services more useful. Possible explanation for this might be that, in general, consumers are always concerned about how to improve their shopping benefits. However, the rich channel choices cannot essentially enhance the shopping utility. For example, channel diversity does not necessarily mean consumers can enjoy lower retail prices, shorter shopping times, or better product quality.

Fourthly, results indicate that the impact of content consistency on perceived usefulness is significant. This is consistent with our common sense. Consistent product information provides a basis for consumers to switch smoothly across different channels, which not only helps improve consumers' shopping efficiency, but also enhances users' confidence in using BOPS service. Coordinated marketing plan, similar product and price structure across channels can ease consumer uncertainty and strengthens their trust in retailers [48]. This result also aligns with the prior research that content consistency helps consumers improve perceived control in omnichannel retailing background [34]. However, since the hypothesis that content consistency positively affects perceived ease of use is not significant, content consistency does not seem to be an important factor affecting consumers' perceived ease of use. Previous studies have also found that the diversification of shopping channels also means that consumers need to spend more time comparing the quality differences of products from different channels before purchasing [49]. Products with the same description create difficulties for consumers to distinguish the authenticity of the product, which may in turn increase the difficulty of shopping.

Finally, we find that process consistency plays a significant role in the process of developing a positive attitude towards BOPS, as it positively affects both perceived usefulness and perceived ease of use. To some extent, the consistency of comparable attributes between channels means that omni-channel retailers show similar service images to consumers in different channels, which is conducive to cultivating consumers' trust in omni-channel retailers, and consumers are more willing to explore BOPS service. According to Avery et al. [50], positive associations that customers form through their knowledge of or visiting a brick-and-mortar store can be transferred to other channels like a halo effect. The presence of large brick-and-mortar stores should have helped increase consumer trust in other channels.

5.2. Implication

First of all, it can be seen from the above discussion that when the transparency of channel services is low, consumers have insufficient understanding of channels, which may reduce the frequency of consumers' use of BOPS services. Conversely, higher channel service transparency is conducive to deepening consumers' understanding of BOPS, thereby improving perceived usefulness and ease of use, and increasing consumers' sustainable usage intention of BOPS. In addition, the breadth of consumers' channel choices is also closely related to consumers' perceived ease of use. However, in fact, due to information asymmetry some consumers are not aware of the existence of online stores set up by physical store retailers, or do not know the existence of physical stores operated by online retailers. Therefore, balancing the online and offline publicity work to improve the transparency of channel services and the breadth of channel selection is the key to increasing the sustainable usage intention of BOPS.

Since omni-channel emphasizes providing consumers with a consistent service experience across channels, content consistency between online and offline channels is one of the basic requirements. If the retailer's physical store and the e-commerce platform sell the same product at different prices, it is easy to cause dissatisfaction among customers who purchase at a high price, which will lead to a bad experience of BOPS service. However, in reality, the operation of different channels may be mainly managed by different online or offline departments, so it is difficult to maintain the same sales information of different channels. Therefore, it is recommended that omni-channel companies can build a unified product information database, carry out the same online and offline employee training, and develop a rotation system between online employees and offline salespersons to ensure content consistency. In particular, the standardization and accuracy of offline sales work are expected to be improved.

The empirical results also show that physical stores and online stores provide consumers with a smooth and consistent service experience process that will allow consumers to perceive the usefulness and ease of use of omni-channel services, thereby affecting the sustainable usage intention of BOPS. A consistent process experience requires omni-channel retailers to formulate consistent service level standards, create a consistent service style, and implement consistent customer relationship management. It should be noted that, considering the relatively complex service process of physical stores, companies should devote more effort to improving the service environment and service quality of offline physical stores in order to balance the service level of the collaborative dual-channel and improve the customer's consumption experience.

6. Conclusions

This paper uses TAM as the basic conceptual framework to discuss the impact of channel integration quality on people's sustainable usage intention of BOPS. On this basis, some management opinions on the implementation of BOPS strategy to promote sustainable retailing are put forward. The main results are as follows. As expected, consumers' perceived usefulness and perceived ease of use have a positive effect on the sustainable usage intention of BOPS. This paper confirms that channel service transparency and process consistency play important roles in the formation of BOPS using intention, as they both promote the sustainable usage intention of BOPS by affecting perceived usefulness and perceived ease of use. However, channel choice breadth has no significant impact on perceived usefulness but has a significant positive impact on perceived ease of use. Finally, we find that content consistency has a significant positive impact on perceived usefulness, but the diversity of channels does not necessarily make consumers find BOPS more useful.

The following three key aspects signify the contributions of this research. First of all, some scholars have conducted empirical explorations on omni-channel retailing. However, the empirical research on BOPS in this sub-area are limited. Especially, few people have studied the influencing factors of sustainable usage intention of BOPS. Therefore, this study is expected to fill this gap. Secondly, this study verifies the effects of perceived usefulness and perceived ease of use on BOPS usage and provides case support for the TAM model in the new omni-channel context. Thirdly, the research explores the important influence of channel integration quality on the sustainable usage intention of BOPS, and the implications can provide reference for BOPS management practice.

Future contributions can be focused on the following research directions. Firstly, from the perspective of channel characteristics, the paper discusses the influence of limited variables on the sustainable usage intention of BOPS. We can further explore the variables that may influence BOPS usage intention from the perspective of consumers' personal characteristics, for example, personal extroversion and personal creativity. Secondly, different product categories may affect the sustainable usage intention of BOPS. For example, for some large household appliances (e.g., refrigerator, air conditioner, washing machine), BOPS allows consumers to inspect products in physical stores, which may greatly reduce

consumers' uncertainty about products [51]. Consumers are more inclined to use BOPS services for products in this category. Therefore, we can investigate the impact of specific categories on BOPS usage intention. Thirdly, we integrate channel integration quality and TAM to identify the factors influencing BOPS usage intention. We may consider other theories to develop and enrich the empirical model, for example, perceived risk and perceived value, to explore the impact of other elements in future research.

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