

Design of Evaluation Index System for Information Experience based on B2C e-Commerce Bigdata and Artificial Intelligence

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Abstract

The online retail market continues to grow, especially in China, as e-commerce has developed rapidly in recent years in many countries. Meanwhile, the development and use of new network information technology provides consumers with various contact and experience environments for online shopping. Based on the theory of media weakness, the study began to focus consumer experience on the nature of commercial transactions. The study proposed and designed an initial measure of the consumer information evaluation index, which combines previous findings with implications. Finally, the five-dimensional B2C system was established to evaluate consumers' information experience providing information display, information interaction, information support and information personalization. We researched on evaluation index system for information experience of B2C e-commerce consumers based on samples of Chinese consumers.

Keywords: B2C e-Commerce, Consumer Experience, Information Experience, Evaluation Index

1. Introduction

At the end of 2016, Ma Yun, Board Chairman of Alibaba Group, proposed “new retail”, a data-driven retail model centered on consumer experience, which marked the beginning of a new development stage of e-commerce. Since the current Internet traffic growth slows down and the E-Commerce Law of the People’s Republic of China was officially implemented from January 1, 2019, the Chinese e-commerce market has been further standardized with increasingly fierce competition, so whoever wins consumers wins the market. How to win consumers? It is critical to center on consumers and continue to improve consumer experience. According to some scholars, experience is a form of perception that is difficult to imitate and exists uniquely;

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personalized, dominated by rationality and driven by sensibility, experience exists at all moments of contact with consumers, which can be both attached to and be independent of products and services. As a series of interaction created by the retailer consciously based on a variety of contact points, experience in online shopping causes of consumers to respond in the interaction. In the shopping process, consumers use and access different contact points, each of them has direct or indirect effects on the purchase and consumer behavior. Some scholars define e-commerce consumer experience as the inner subjective response generated in the direct or indirect contact between consumers and enterprises. Other scholars argue that consumer experience has characteristics such as interactivity, uniqueness, embedded situation, multi-dimensionality and integrality and raise the differences and connections between overall experience and specific experience. In summary, consumer experience in online shopping is an important concept worth in-depth study.

2. Related Works

2.1 Definition of e-Commerce

Governments, scholars and businesspeople in different countries have defined e-commerce according to their different positions and perspectives of engagement. This research adopted the definition by China Science Communication Encyclopedia Entry Project. E-commerce is a series of commercial activities centered on product transactions by means of information network technology. It can also be understood as the activities of trade and related services on the Internet, intranets and value-added networks, which is characterized by electronization, cyberization and informatization in all aspects of traditional commercial activities. In summary, all Internet-based commercial actions belong to e-commerce.

2.2 Core Factors of e-Commerce

E-commerce is a kind of commerce in essence, which is a process of ownership transfer of products and funds based on information acquisition and interaction, even based on Bigdata [1-3, 11]. What are the core factors of e-commerce? According to some scholars, the whole e-commerce activity is a flow process of products, funds and information, and the “three-in-one flow” is the necessary condition for product transactions. Since buyers and sellers’ complete online transactions mainly through information acquisition and interaction, the information flow is the most important in the three flows, which is the key to the success of commercial transactions. Product information reflects the nature of products as well as their motion state and mode in economic circles, which includes both information of all products and information of all related commercial activities. Problems of delivery, security, customer service and website design that are often encountered in the entire process of e-commerce transactions can be summarized by fund flow, product flow and information flow.

As an e-commerce model, B2C e-commerce is defined based on e-commerce transaction subjects, namely business-to-consumer e-commerce, which specifically means that businesses and consumers carry out various commercial activities, trading activities, financial activities and comprehensive service activities through information networks and electronic data information and that consumers directly participate in economic activities through the Internet. In B2C, B represents businesses, which are product suppliers, 2 (two) is the homonym of “to”, and C represents consumers. The core factors of B2C e-commerce also include fund flow, product flow and information flow.

2.3 Research Status of Information Experience

The media richness theory, in various analytics even such as Artificial Intelligence [4-11, 13], was first put forward in the research on organizational communication. The media richness is measured at four dimensions,

namely information richness, effect of information interaction, accuracy of information display, and information personalization. The effects of media information richness on the information reception by people can be ranked from high to low as follows: face to face, video, audio, and text. The media richness determines the ability of the audience to receive the information, so with the richer media, the audience can ultimately form the purchase intention and make a decision with better experience, higher persuasiveness and improved recognition, which reflects the importance of information objectively. In this information technology era, it is easier for consumers to access information through the Internet, and human society has undergone unprecedented changes brought about by information technology. In particular, Web 2.0 characterized by openness, participation and interaction has shifted the information source from the elite to the public so that consumers have a platform to tell their consumption experience, explain their consumption behavior and evaluate the product with their personalized words.

In the actual research, scholars make studies and explorations from the perspective of information display. Some scholars apply the S-O-R model to the research on online consumption decision and behavior and believe that consumers make different purchase decisions due to the different information provided by online shopping sites. As is known to all, online shopping sites are mainly to provide price information and product information to help consumers reduce the search cost, and the richer online information with higher quality can lead to higher customer satisfaction. It is believed by consumers that most B2C e-commerce sites provide insufficient, incomplete and even obviously incorrect information so that they refuse to make a purchase decision. According to a survey by E-Tailing, 76% of respondents received insufficient information during online shopping and 72% complained of incomplete product information that led to their quit from online purchase. As far as the display of product information is concerned from the perspective of consumers, consumers limited by their own cognitive capabilities need a lot of information to understand the products in order to obtain better consumption experience and make purchase decisions. Information displayed in advertisements such as price, function, structure, use, promotional discount and outer packing can help consumers make better purchase decisions, so some scholars classify product information displayed into brand information, product attribute information, evaluation information and experience information, and some scholars use information as a stimulating factor as well to study how the display form and content can affect the pleasure, trust and social presence of online shopping and ultimately affect purchase decisions of consumers. Of course, the richness of shopping experience of consumers also affects their willingness. Some scholars argue that consumers mainly rely on experience and knowledge to make purchase decisions, but those with insufficient or none shopping experience refer to the information obtained to make decisions. Therefore, online shopping sites tend to display multimedia information online, including recommendations, product information, and related knowledge.

As found by some scholars, information content, design, security and privacy on e-commerce websites are the four key variables that stimulate the online purchase intentions of consumers. The quality of information can be evaluated at four dimensions, namely accuracy, understandability, integrity and relevance. Some scholars include information experience into the research on the experience of B2C e-commerce consumers as an independent dimension and find that information experience has positive effects on both willingness and loyalty of online shopping. Different consumer characteristics affect consumer experience at three dimensions, namely information experience, payment experience, and logistics experience.

3. Selection of Evaluation Indexes

3.1 Question Design of Evaluation Index System

Consumer information experience is a series of continuous reaction accompanying the entire shopping process. During online shopping, consumers identify, understand, analyze, ratiocinate and judge the

information obtained from all channels through information collection, browse, retrieval and interaction to make final purchase decisions. Based on the above-mentioned concept definition and theoretical research, this research used the literature method and observation method and combined with the characteristics of B2C online shopping to improve the existing measurement scale and put forward new questions for the initial measurement of consumer information experience, which mainly include the following five dimensions.

In this research, information display refers to the basic information of platform operation and descriptive information of communities provided by B2C online shopping sites. As the most basic information contact point perceived by consumers during shopping, information display affects the initial impression of consumers on B2C online shopping sites. Based on the research questions raised by Holbrook & Batra, Jiang & Benbasat, Liao Yichen, Zheng Chundong et al., and Yu Xin on information display and combined with the information classification criteria in this research, information display was described from six aspects, as shown in Table 1.

Table 1. Initial measurement questions of information display dimensions

Dimension	Measure the Multi-item	Reference
Information Display	ID1 The platform is rich in information and timely updated.	Holbrook and Batra (1987). Jiang and Benbasat (2007). Liao yichen (2012) Zheng chundong et al. (2016) Yu xin (2017) this research
	ID2 Commodity information classification is simple and easy to distinguish.	
	ID3 Commodity information display forms are diverse (text, pictures, video, 3D, etc.).	
	ID4 Product information related description is complete and detailed (sales status, brand history, parameter characteristics, appearance details, etc.).	
	ID5 Product information is clear and easy to understand.	
	ID6 I can easily find more accurate product information (through search, navigation, etc.).	

In this research, information interaction refers to the intelligent mutual aid of information and interaction with manual customer service provided by B2C online shopping sites. As the most flexible information contact point perceived by consumers during shopping, information interaction affects in real time consumer experience of B2C online shopping sites. Based on the research questions raised by Liu, Zheng Chundong et al., and Yu Xin on information interaction and combined with the information classification criteria in this research, information interaction was described from four aspects, as shown in Table 2.

Table 2. Initial measurement questions of information interaction dimensions

Dimension	Measure the Multi-item	Reference
Information Interaction	IInt1 Platform/merchant and I communicate in a smooth two-way interactive environment.	Liu (2003) Zheng chundong et al. (2016) Yu xin (2017) this research
	IInt2 Platform/merchants can quickly and effectively explain and respond to my questions.	
	IInt3 I can freely choose different interactive modes -- intelligent self-help consultation and manual consultation.	
	IInt4 I have the discretion to terminate the information exchange and interaction process with the platform/merchant.	

In this research, information incentives refer to the guarantees, promotions, reviews and applications of new technologies provided by B2C online shopping sites to stimulate the shopping desire of consumers. As the most critical information contact point perceived by consumers during shopping, information incentives to some extent determine the purchase decisions of consumers on B2C online shopping sites. Based on the research questions raised by Holbrook & Batra, Zhang Mengxue, and Yu Xin on information incentives and combined with the information classification criteria in this research, information incentives were described from three aspects, as shown in Table 3.

Table 3. Initial measurement questions of information incentive dimension

Dimension	Measure the Multi-item	Reference
Information Incentive	IInc1 The guarantee information provided by the platform/merchant (genuine product guarantee, false one-indemnity ten, freight insurance, unconditional return for seven days, payment guarantee, etc.) makes me confident in commodity trading.	Holbrook and Batra (1987).
	IInc2 The promotion information provided by the platform/merchants is highly matched with the commodities I pay attention to, which makes me more interested in purchasing commodities.	Zhang Mengxue (2016). Yu xin (2017)
	IInc3 The comment information provided by the platform/merchant contains a lot of valuable pictures and texts, which makes me look forward to the quality of the products.	this research

In this research, information support refers to the mutual aid information provided by B2C online shopping sites for members. Since WeChat has become an instant messaging tool widely used by Chinese consumers (2018 WeChat Data Report shows 1.082 billion monthly average active users), WeChat group belongs to the mutual aid information community for members in the broad sense. As the warmest information contact point perceived by consumers during shopping, information support affects their moods in experience of B2C online shopping sites. Based on the research questions raised by Liang and Yu Xin on information support and combined with the information classification criteria in this research, information support was described from three aspects, as shown in Table 4.

Table 4. Initial measurement questions of information support dimension

Dimension	Measure the Multi-item	Reference
Information Support	IS1 Friends of the platform's member mutual help community, WeChat group and other social circles will provide suggestions when I need help.	Liang (2011). Yu xin (2017) this research
	IS2 When I have a problem, friends on the platform's member mutual help community, WeChat group, and other social circles will provide information to help me.	
	IS3 When I have a problem, friends in the online social circle such as the member's mutual help community and WeChat group will help me find out the reason and give me advice.	

In this research, information personalization refers to the targeted pages, promotional advertisements and information services provided by B2C online shopping sites in terms of consumer propensity and interest. As the most humanized information contact point perceived by consumers during shopping, information personalization helps consumers strengthen their sense of belonging to online B2C shopping sites. Online personalization is an opportunity for retailers to provide customized information and implement strategies based on consumer preferences with a view to persuading them to choose a product or service. Based on the research questions raised by Kamis, Koufaris, & Stern and Kim & Ammeter on information personalization and combined with the information classification criteria in this research, information personalization was described from three aspects, as shown in Table 5.

Table 5. Initial measurement questions of information personalization dimension

Dimension	Measure the Multi-item	Reference
Information Personalization	IP1 The platform provides a product display page that is highly related to my consumption tendency or hobbies.	Kamis,Koufaris, &Stern(2008) Kim&Ammeter(2014) this research
	IP2 The platform provides promotional advertising information that is highly relevant to my consumption tendency or hobbies.	
	IP3 I feel as if the information on the platform has been specially screened for me, which is highly relevant to my consumption tendency or hobbies.	

3.2 Initial Measurement Scale of Evaluation Index System

Development of initial measurement scale of evaluation index system is shown in Table 6.

Table 6. Initial measurement scale of evaluation index system for information experience

Dimensions	Initial Indexes
Information Display	ID1 The platform provides simple and distinguishable product information classification
	ID2 The platform provides diverse forms for product information display (image-text, animation, video, etc.)
	ID3 The platform provides complete and detailed description of product information (sales status, transaction price, brand culture, parameter characteristics, appearance details, etc.)
	ID4 The platform provides clear and understandable product information display content
Information Interaction	IInt1 This platform provides convenient online information interaction tools and channels
	IInt2 The platform provides a variety of interactive methods - intelligent self-service and online customer service
	IInt3 This platform can explain and reply to my questions in a timely manner.
	IInt4 I can decide whether to terminate the information exchange and interaction with the platform customer service.
Information Incentives	IInc1 The platform/merchant provides guarantee information (genuine guarantee, ten-time compensation for the fake, guaranteed return of damaged products, payment guarantee, etc.) so that I can rest assured
	IInc2 The platform/merchant provides promotion information that highly matches the products I am concerned about so that I am more interested in the purchase
	IInc3 The platform/merchant provides vivid product information display (video demo, trial review, etc.) so that I have more expectations for the product quality.
	IInc4 The platform/merchant provides review information that reflects more details so that I see product transactions more rationally
Information Support	IS1 The platform provides the mutual aid community Asks Friends and WeChat group in which friends can give me advice when I need help
	IS2 The platform provides the mutual aid community Asks Friends and WeChat group in which friends can give me a hand when I encounter a problem
	IS3 The platform provides the mutual aid community Asks Friends and WeChat group in which friends can help me analyze the problem and give me advice.
	IS4 Overall, I can solve some problems in online shopping through the information support and help from the platform or my friends
Information Personalization	IP1 The platform can generate highly relevant product display pages based on my preferences or interest.
	IP2 The platform can push highly relevant promotional advertisements based on my preferences or interest.
	IP3 The platform can provide relatively appropriate information and browsing methods based on my preferences or interest.
	IP4 Overall, the platform can provide highly relevant personalized information based on my preferences or interest.

4. Construction of Evaluation Index System

4.1 Reliability Analysis

The reliability of the scale is generally judged by the internal consistency coefficient Cronbach's α of dimensions. Developed in 1951, Cronbach's α is mainly used to test the internal consistency of multi-dimension scale, which has been validated by a number of studies as an effective index to evaluate the reliability of scale. The value of α is 0-1, and the value closer to 1 means stronger correlation between the questions and higher reliability of internal consistency. In general, the value greater than 0.8 means higher internal consistency, the value 0.6-0.8 indicates high internal consistency, and the value below 0.6 shows weak internal consistency. In this research, the internal consistency analysis of the five questionnaire dimensions showed that the deletion of a question can improve the reliability of its dimension, and the value of α of each

dimension is greater than 0.8. At the same time, the measured internal consistency of the whole index system (overall dimension) is 0.912, as shown in Table 11. The test results showed high reliability of the index system.

Table 7. Reliability statistics

Evaluation object	Dimension	Items	Dimensions Cronbach's a
B2C e-commerce consumer information experience evaluation index system	Information display	4	0.819
	Information interaction	3	0.837
	Information incentive	3	0.813
	Information support	4	0.879
	Information personalization	4	0.835

4.2 Validity Analysis

Structure validity refers to the degree of conceptual structure and traits that the index system needs to measure, which is an important criterion to evaluate the quality of the index system and can be judged by the degree of variation explained by the cumulative variance. According to Table 9, the amount of variation explained by the cumulative variance of the indicator system is 71.203%, which indicates high validity of results.

Content validity refers to the suitability between the measurement content and target, which also refers to the consistency of the selected item with the measurement purpose and requirements. In view of this, 2 e-commerce enterprise managers, 5 management doctors and 3 e-commerce professors were invited to test the content validity of the questionnaire, who gave targeted opinions and suggestions on the evaluation indexes in the prediction and revision of the questionnaire. Finally, 18 indexes that can reflect the representative dimensions and questions for the evaluation on information experience of B2C e-commerce consumers were determined to effectively guarantee the content validity of the scale.

4.3 Formation of Index System

After the test of reliability and validity, this research finally formed an evaluation index system for information experience of B2C e-commerce consumers that contains 5 dimensions and 18 indexes.

5. Conclusions

Information is self-evident and plays an important role, especially in online shopping platforms and e-commerce, where traders are increasingly paying attention to consumer experience. Based on previous studies of consumer experience, this study expands the impact of consumer experience in terms of information activity and builds an information experience assessment system that includes five and 18 indices of B2C consumers. This evaluation system will enrich your research view of the consumer experience and break down into five categories: information, interaction, information incentives, information promotion and personalization. This classification is not static information retrieval but a comprehensive experience in real-time collection, interaction, comparison and use, and is therefore an important reference point for online shopping and successful transactions. According to the results of an questionnaire analysis, the index system can effectively summarize the consumer information interface at the time of purchase and evaluate B2C consumers' information experience comprehensively and systematically.

Despite the expansion, scope and impact of specific research results and the consumer information experience, limitations and shortcomings that should be explored in the future remain due to the limitations of objective conditions such as time and physical resources. First, the re-elected questionnaire shows that despite the age of 20-49 chosen for the study, nearly 75 percent of the

students are in college and few other vocational trainees participate. Second, this study may influence the dimensions and content of information elements other than online shopping sites, macro development environment information of B2C e-commerce, and information on consumer information ownership.

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