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The Impact of Privacy Seal on Users' Perception in Network Transactions

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In the age of big data, the issue of online privacy has attracted much attention from all sectors. The introduction and establishment of an evaluation system for the privacy agreement based on a third party, together with the establishment of a safer internet transaction environment, can help to establish mutual trust between users and the platform. With the research background links to the online trading platform, this article investigates how the privacy seal which is provided by the third-party evaluation organization influences and addresses trust-awareness and privacy concerns of users, as well as exposing information and purchasing data. According to this investigation, the application of a privacy seal not only increases the trust-awareness of the users, but can also encourage the intention to disclose information and engage in a transaction. However, it might not totally alleviate the users' privacy concerns. The results of our research and practical application indicate that the promotion and guarantee of the independence and expertise of the third-party evaluating organization, the effective supervision of privacy policy implementation by the online trading platform, and measures that protect the privacy of the users, all play a vital role in establishing an effective privacy agreement evaluation system.

Keywords: online trading platform, privacy seal, trust-awareness, Internet privacy concerns, information disclosure intention, purchasing intention

1. INTRODUCTION

In the last few years, the rapid and widespread exploitation of the Internet, the application of big data technology, and cloud computing have provided various and convenient personalized services to an increasing number of people [1]. The relevant reports indicate that the number of mobile Internet users in China reached 1.27 billion in 2019, and the number of users in the mobile shopping industry in 2018 reached 783 million. It is very common for online trading platforms to collect users' personal information so that they can establish user databases, and implement precisely targeted marketing strategies and personalized services by means of technologies such as big data and cloud computing. However, in 2018, the China Consumers Association evaluated the privacy measures of ten types of mobile applications including online shopping, financial management, photographic processing and mailbox cloud disk, and found that the mobile applications have problems including excessive information collection, lack of privacy provisions, incomplete terms or inappropriate transaction terms to some degree. In big data, disclosure of private user information is frequently occurring, and information security issues are becoming more diverse and widespread. For instance, Jingdong Financial App was exposed to the interception of user sensitive images to steal private user information in 2019. This caused widespread public concern and discussion about the security of personal information, attracting great attention from all stakeholders.

The privacy agreement as a unique form of contract is a common feature of e-commerce nowadays. It is widespread and consistently applied, the content is comprehensive and detailed, and the process of contract conclusion is efficient and convenient, so that the economic efficiency of the dimensions and the effective allocation of resources can be implemented. However, the pursuit of profit may lead to inequity and even the emergence of unreasonable terms in many internet trading platforms. The lack of contractual awareness and lengthy legal jargon could lead to online consumers misunderstanding the contents of privacy agreements. If the trading platform does not have procedures that enable consumers to express their opinions or obtain explanations of the terms and conditions, and the

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electronic contract does not have "leave' or ''accept" options, the consumers' acceptance of the platform's privacy policy cannot be fully negotiated. Furthermore, in terms of the administrative agencies, as the scale of the online trading platform continues to expand and the form of transactions evolves, its rules are constantly changing and accumulating. If the administrative agency is responsible for reviewing the privacy agreement of the online trading platform, not only will the cost be too high, but also the level of specialization will be inadequate. Hence, in this paper, we provide a comprehensive method by which organizations can establish a third-party evaluation system for the privacy agreement of an online trading platform. The proposed third-party evaluation system not only enables the platform privacy agreement to be reviewed and evaluated, but also can guide the online trading platform in formulating a more complete and reasonable privacy agreement, and improve the overall performance of the platform.

2. RESEARCH EFFORTS REVIEW AND THEORETICAL ASSUMPTIONS

2.1 Privacy Seal, Privacy Concerns, Trust Perception, Willingness to Disclosure and Willingness to Buy

2.1.1 Privacy Seal

The privacy seal is a certification mark or stamp granted to an online trading platform that reviews and ranks relevant standards established by an independent and trusted third-party assessment organization for the collection, disclosure, use, and protection of information in according to the privacy policy. For instance, in the United States, the privacy certification mark can be granted by third-party organizations such as TRUSTe, BBBOnline, and CPA WebTrust. Users can click on the privacy certification mark or stamp of the online trading platform to divert to the website of the third-party evaluation organization to view the privacy seal level and the seal time limitation of the relevant online trading platform. According to a survey released by TRUSTe, some companies' sales have increased after the introduction of the privacy mark, and customer relationships have improved. Debnroo.com had a 29% increase in sales after receiving the TRUSTe privacy mark, and AchooAllergy showed a 10% increase. Peterson found that in B2C transactions, the privacy seal can alleviate the fear of website users about online transactions and help to improve the users' perception of trustworthiness [2]

2.1.2 Privacy Concerns

Privacy is a complex and dynamic concept. Experts in psychology, sociology, philosophy, law and other disciplines have studied privacy in from many perspectives. The concept of "privacy concerns" has also been introduced in Western management research. In fact, Culnan defines privacy concerns as concerns about how individuals use and protect information disclosed by individuals [3] Zhu Hou defined privacy concerns as a subjective perception that can measure individuals' illegal collection, illegal storage and illegal transmission of private information [4]. Hong and Thong define network privacy concerns as privacy concerns in the context of the Internet related to the way that users collect and use other users information on the website [5]

In order to measure users' privacy concerns, scholars worldwide have been continuously designing and improving ways to address privacy concerns. Smith et al. designed the CFIP scale for the traditional marketing market, which includes collection, secondary use, improper access, and error dimensions [6] Malhotra et al. developed the IIUPC scale for traditional Internet, where privacy concerns consist of three dimensions: collection, control, and awareness [7] Yang Lan and other researchers have found that the IIUPC scale is the most appropriate for China [8]. Hong and Thong in their studies found that the new scale formed by the combination of the CFIP scale and the IIUPC scale is more appropriate for addressing the privacy concerns of Web 2.0 users [5]. Taking previous research into account, this paper considers four aspects of privacy concerns: collection, control, awareness and relief. Collection refers to the level of users' concern in regard to the collection of personal information by the online trading platform. Control refers to the level of user's concern about the control and utilization of users' personal information by the online trading platform. Awareness refers to the users' degree of concern about the transparency of the privacy of the online trading platform. Relief refers to the degree to which users need to worry about whether they can be compensated when a mishap occurs or a misdemeanor is committed on the part of the online platform.

2.1.3 Trust Perception

In recent years, user information leakage incidents have occurred frequently, and the virtual characteristics of e-commerce have made users pay more and more attention to the trust and privacy protection transmitted by online trading platforms. Doney and Cannon propose that the trust between the two parties is the credibility of the transaction object and the perception of goodwill [9]. Turban et al. defined trust from the e-commerce situation, and suggested that trust is individual's willingness to undertake risks and may abide losses caused by the behavior of the transaction object. It is the willingness of the two parties to continue to interact to achieve common aims [10] This article will use the definition of network trust by Malhotra et al., that is, the degree to which network users can rely on the protection of personal information on websites [7].

2.1.4 Willingness to Disclose Information

Jiang Su believes that self-disclosure is the process by which individuals convey their personal information and personal feelings to their contacts in the process of communication. [11] Xie Xiaochun and others believe that self-disclosure is the behavior of individuals using various methods to transmit personal information on the Internet to meet individual needs and maintain communication [12]. Domestic and foreign scholars agree that the willingness to expose user information is closely linking to the user's information exposure behavior. Phelps

indicated that consumer privacy disclosure behavior is related to the intention of consumer information sharing [13] Wang Wei believes that the exposure of privacy information on social networking sites will be influenced by the behavioral intentions and privacy attitudes [14] Bansal et al. found that consumers' personal personality and privacy concerns in online transactions affect their willingness to disclose information privacy, which in turn affects their privacy disclosure behavior [15]. In the age of network information, personal information and information disclosure forms are more diversified and dynamic. In this case, in order to discover user's information disclosure behavior, it is especially important to study the intention of user's information disclosure.

2.1.5 Willingness to Buy

Schiffinan believes that the willingness to buy can measure the likelihood of an individual purchasing a particular good or service, that is, the higher the consumer's willingness to buy, the greater the likelihood of their purchase [16]. In the wake of the continuous development of e-commerce and network technology, academics are constantly studying the willingness of consumers to buy in new situations. Wu Jinfeng et al. define online shopping intentions as a conscious plan for consumers to purchase online products or services [17] Zhang Yan defines internet shopping intention as the subjective possibility of consumers shopping online products in virtual shopping malls in the online environment [18] Some scholars have suggested that the willingness to buy consists of two dimensions, namely, the willingness to purchase and the willingness to recommend others to purchase. In combination of previous research background, the current study defines the purchase intention as the psychological tendency of users to select, purchase and recommend online goods and services in the context of e-commerce.

2.2 Research Hypothesis

2.2.1 Relationship between Privacy Seal and Trust Perception

Hoffman and other studies have found that third-party certification will have an important impact on consumer perception of trust [19] Peterson and other researchers found that in the B2C trading situation, the privacy seal can eliminate the consumers' fears to online transactions, and increase consumer trust [2]. Some scholars have studied the privacy seal in a specific field of research. Wang Xiaoyan's research found that the privacy agreement and privacy seal of the website can improve customers' trust in online banking [20]. Similar to previous research, our study also proposes that the privacy seal will improve user's trust; in other words, if the online trading platform has been granted the privacy seal by a third-party evaluation organization, users perceive the platform to be more reliable. Hence, the current study proposes the following hypothesis:

H1: The privacy seal has a positive effect on the user's perception of trustworthiness.

2.2.2 Relationship between the Privacy Seal and Privacy Concerns

Zviran's research confirms that privacy protection technologies such as privacy policies can effectively reduce consumer privacy concerns [21]. Ling Xia research found that in the mobile electronic context, the privacy seal and reputation of the website are the most significant factors affecting consumers' perception of privacy security [22] Previous research on website privacy policy has found that a privacy policy is an effective means of mitigating users' privacy concerns. Hence, this paper proposes that the privacy seal will reduce privacy concerns; that is, the privacy seal of the third-party assessment organization will effectively reduce the privacy concerns of users. Based on this, the following hypothesis is proposed:

H2: The privacy seal helps to alleviate users' privacy concerns.

2.2.3 Relationship between the Privacy Seal and Willingness to Disclose Information

Andrade et al. found that good website reputation can significantly reduce consumer concerns about self-disclosure [23] Research by Zlatolas and others confirmed that the social norms of privacy protection and privacy protection regulations are important factors influencing Facebook users' disclosure of personal information on social networks [24] Research by McKnight suggests that consumers trust those websites that provide privacy seals given by organizations such as WebTrust, and are prepared to disclose personal information to them [25] Hence, it appears that when a user browses a website that has been granted a privacy stamp, the user has a higher level of trust in the website and is more willing to disclose information. On this basis, this paper proposes that the privacy seal will have a positive influence on the user's willingness to disclose information on the online trading platform. Hence, the following hypothesis is proposed:

H3: The privacy seal has a positive effect on the user's willingness to disclose information.

2.2.4 Relationship between the Privacy Seal and Purchase Intention

Scholars worldwide generally believe that consumers' intention to purchase will be influenced by both internal and external factors. The internal factors mainly refer to the individual characteristics of consumers. The external factors mainly include factors such as the consumption environment, and the products and services being offered. This paper will mainly discuss the impact of the privacy seal on the purchasing intentions of users. Earp's research found that the website's privacy agreement not only reduces consumers' perception of privacy risk, enhancing the perception of trustworthiness, but also effectively increases consumers' intention to engage in transactions [26]. Wang Xiaoyan's research confirms that both the privacy agreement and the privacy seal can positively influence the user's intention to engage in online banking [20]. On this basis, this paper proposes that the privacy seal will have a positive influence on the user's willingness to purchase on the online trading platform. Hence, this study proposes the following hypothesis:

H4: The privacy seal is positively affecting the user's willingness to purchase.

3. DATA COLLECTION AND ANALYSIS

3.1 Questionnaire Design

This study used a two-part survey questionnaire. The first section collected demographic data from participants. The other section was designed to measure each dimension of the theoretical model, based on the existing literature and the research conducted in this paper. The questionnaire items were measured by means of a five-point Likert scale, and a small-scale pre-test was conducted prior to the main survey. The structure and expression of the questionnaire items were appropriately modified according to the feedback obtained from the pre-test. After modification, the final questionnaire was distributed to participants.

3.2 Data Collection

The questionnaire survey was distributed through Star software. A total of 361 questionnaires were distributed, 33 invalid responses were excluded, leaving 328 valid responses, giving an effective recovery rate of 90.86%. The demographic characteristics of the samples collected for this study are shown in Table 1.

3.3 Data Analysis and Results

3.3.1 Reliability Test

This study used SPSS to determine the reliability of the scale. Table 2 displays the SPSS results. The Cronbach' Alpha coefficient of all latent variables is greater than 0.7, and values for some items are 0.9 or greater, indicating that the measurement items of this study have good agreement. For gender and stability, the scale has good reliability.

3.3.2 Validity Test

SPSS was applied to conduct exploratory factor analysis on the measurement items. The results are shown in Table 2. The KMO values of the five dimensions of privacy seal, trust perception, privacy concerns, willingness to disclose information, and purchase intention are all greater than 0.7. For Bartlett's test of sphericity, the square values are all significant at the 0.000 level, indicating that the collected data is eligible for factor analysis. Using the maximum variance method for orthogonal rotation, the five principal components with eigenvalues greater than 1 were co-precipitated, and the cumulative variance contribution rate was 73.358%, indicating that the five factors extracted from the 20 items are suitable for data analysis and interpretation.

AMOS was used to perform confirmatory factor analysis on five dimensions of the measurement items. In this study, five variables - including privacy seal, trust perception, privacy concerns, intention to expose information, and purchase intention - were used to construct a five-factor model. Using CMIN/DF, eight indicators of RMSEA, RMR, GFI, CFI, IFI, PCFI and PNFI determined that the model has a good degree of fit. The results are shown in Table 3. The average weight of each item is between 0.654 and 0.917, which is greater than 0.65, indicating that the measurement items corresponding to each factor are highly representative. In addition, the mean variance extraction (AVE) of each factor was greater than 0.5, and the combined reliability of each factor is between 0.796 and 0.939, which is greater than 0.75, indicating that the scale of the study was ideal.

3.3.3 Hypothesis Testing

The four hypotheses of this study were tested using linear regression provided by SPSS. Firstly, gender and age are used as control variables to verify the impact of privacy seal on user trust perception, the impact of privacy seal on user privacy concerns, the impact of privacy seal on user information disclosure willingness, and the effect of privacy seal on users' willingness to shop online. The test results are shown in Table 4. The impact of the privacy seal on user privacy concerns is not significant, and H3 is not supported. The privacy seal has a significant positive influence on the user's perception of trust, intention to expose information and intention to shop. The regression coefficients are 0.467 ($P<0.001$), 0.321 ($P<0.001$), and 0.318 ($P<0.001$), respectively. Hence, both H2 and H4 are supported.

4. SUMMARY

4.1 Discussion and Analysis of Results

(1) The privacy seal has a positive influence on the user's perception of trustworthiness, which is in line with the results obtained by previous researches, indicating that the privacy seal will effectively enhance the user's trust in the online trading platform. Therefore, users will trust the third-party that evaluates the privacy seal of the online trader. On the one hand, users can check whether the online trading platform has a privacy seal, and by checking its level and timeliness, the user can more accurately determine whether the platform is worthy of trust. Nora's research found that consumers are more inclined to believe in the privacy seal of the website than the privacy agreement [27]. The reason for this may be that some countries have more mature self-regulatory mechanisms. For instance, consumers are more likely to agree with the independence and professionalism of third-party evaluation organizations in the United States, so they are more willing to trust the privacy seal. Because privacy protocols are usually lengthy and expressed in jargon-ridden language, users are deterred from reading the entire document. Therefore, for many users, the privacy seal determines whether a network trading platform is trustworthy. However, similar third-party assessment agencies have not appeared in the field of e-commerce privacy protection in China. How to ensure and improve the credibility and independence of third-party evaluation organizations, and improve the influence of the organization on online trading platforms and users, are problems which need to be further studied and resolved.

Table 1 Respondents' demographic characteristics.

characteristic	Classification	frequency	Proportion	characteristic	classification	frequency	proportion
gender	male	159	48.48%	Online shopping frequency	never	6	1.83%
	female	169	51.52%		At least once a year	22	6.71%
age	$\leqslant$ 18	20	6.10%		At least once a quarter	49	14.94%
	19 $\sim$ 24	137	41.77%		At least once a month	221	67.38%
	25 $\sim$ 34	108	32.93%		At least once a day	30	9.15%
	35 $\sim$ 44	34	10.37%	Privacy Policy Reading situation	Will browse the whole	39	11.89%
	45 $\sim$ 54	22	6.71%		Read only the key identification section	64	19.51%
	$\geq$ 55	7	2.13%		Never read at all	101	30.79%
Online shopping age	2 years or less	44	13.41%		Not necessarily	124	37.80%
	3 $\sim$ 5 years	215	65.55%				
	6 $\sim$ 8 years	47	14.33%				
	More than 8 years	22	6.71%				

Table 2 Measurement index for reliability.

factor	index	Estimate	AVE	CR	Cronbach' α	KMO
Privacy seal	A1	0.868	0.624	0.832	0.829	0.708
	A2	0.767				
	A3	0.729				
Trust perception	B1	0.781	0.568	0.798	0.797	0.709
	B2	0.761				
	B3	0.718				
Privacy perception	C1	0.82	0.661	0.939	0.941	0.915
	C2	0.797				
	C3	0.805				
	C4	0.917				
	C5	0.891				
	C6	0.677				
	C7	0.698				
	C8	0.866				
Willingness to disclose information	D1	0.911	0.571	0.796	0.847	0.729
	D2	0.675				
	D3	0.654				
Willingness to purchase	E1	0.836	0.601	0.818	0.818	0.718
	E2	0.736				
	E3	0.75				

Table 3 Confirmatory factor analysis results and indicators.

model	CMIN/DF	RMSEA	RMR	GFI	CFI	NFI	PCFI	PNFI
5-factor model	2.359	0.064	.024	0.908	0.949	0.915	0.779	0.751
judgement standard	<3	<0. 08	<0.05	>0. 90	>0. 90	>0. 90	>0.50	>0.50

Table 4 Model verification results.

factor		Trust Perception	Privacy perception	Willingness to disclose information	Willingness to buy
Control variable	gender	.075	−.022	.053	.008
	age	.083	−.001	.021	.071
Independent variable	Privacy seal	0.467***	.017	0.321***	0.318***
R^2		.231	.001	.323	.105
Adjust the R^2		.224	−.009	.104	.097
F		32.453***	.059	12.566***	12.660***

(2) The negative influence of the privacy seal on users' privacy concerns is not significant, which is inconsistent with previous research results. When users browse and use an online trading platform that has been granted a privacy stamp, their inner privacy concerns have not been effectively alleviated. The reason for this may be that the current website illegally collects and uses user information, or privacy leakage incidents are frequent and not handled properly. All these issues add to user's anxiety about the privacy of personal information on the network. In China, self-regulatory mechanisms in industry are still immature. Hence, the e-commerce field wants to introduce third-party evaluation organizations. To review and evaluate the privacy policies of major platforms, we must first ensure the credibility and appropriate monitoring of the privacy seal. Only by ensuring that third-party assessment organizations can effectively oversee the privacy policies and privacy protection methods of online trading platforms, promote the continuous improvement of the privacy protocols of the platform, and improve the privacy protection capabilities of the platform, will the privacy concerns of users be alleviated.

(3) The privacy seal has a positive influence on the user's willingness to reveal personal information. What concerns users is not only the platform's compliance with the privacy agreement to personal information, but also whether the platform can effectively protect user information. In this case, when users browse an online trading platform that has been granted the privacy seal, they may consider the external constraints of the third-party evaluation organization. If they believe that their personal information can be properly collected and effectively protected by the platform, this will increase their willingness to disclose information, and they will tend to provide more and more personal information to the platform. Only by improving the user's willingness to disclose information and obtaining more accurate personal information, can a platform achieve precisely targeted marketing, provide users with more suitable products and more precise personalized services, and achieve a win-win situation for both consumers and suppliers.

(4) The privacy seal has a positive influence on the user's willingness to purchase, indicating that the privacy seal can effectively increase the probability of users purchasing goods or services online, and recommending these to others. Research has found that consumers' willingness to purchase will be affected by perceptions of interest and risk. Hence, when users browse an online trading platform that has been granted the privacy seal, they will think that the platform has a good brand reputation and better means protecting information, thus reducing the perception of risk and increasing the willingness to purchase. Moreover, when purchasing a product or service on an online platform that has been granted a privacy seal, the user will consider the convenience offered by the purchase, personalized service, etc., which increases the sense of interest and the willingness to purchase on the platform.

4.2 Research Insights

In 2018, the promulgation of the "Network Security Law of the People's Republic of China" and the publication of the draft of security regulations pertaining to personal information show that the system of legal requirements relevant to online privacy in China is gradually improving. On the base of relevant legislation, the third-party assessment organization can stipulate and formulate more detailed and more professional privacy agreement principles and implementation methods based on the features of the online transaction industry, and implement more flexible and efficient supervision methods. Only by actively promoting the third-party evaluation system within the framework of the law can the discrepancy between the collection of user information and user privacy concerns be addressed.

In the United States, third-party assessment organizations have begun to pay dividends to companies and promote industry privacy protection. However, in China, the establishment of third-party assessment organizations is relatively slow, and both consumers and platforms are not fully aware of such companies. In order to ensure the credibility and independence of third-party evaluation agencies, the government needs to establish the access standards of the third-party evaluation organization and oversee its management and supervision. The third-party evaluation organization should establish strict auditing standards and a rating system for the privacy agreements of online trading platforms, strictly review the privacy protocols of each platform, and use technology such as big data to dynamically monitor the privacy protection methods of each platform.

In China's e-commerce industry, there has not been a third-party evaluation agency such as TRUSTe that can deal with privacy issues on online platforms. Consumers do not understand or lack sufficiency trust in third-party assessment agencies. Therefore, in order to ensure the professionalism of third-party assessment agencies, we should actively promote the privacy seal certification mechanism to consumers, and emphasize the independence and role of third-party assessment organizations, so that consumers can determine the level and timeliness of privacy seals to judge the privacy protection capabilities of online trading platforms and to estimate the

risks of providing personal information. Third-party assessment organizations can review and evaluate the privacy agreements of online traders, and they can improve the formulation of their privacy agreements and monitor their privacy protection behavior. Moreover, the third-party evaluator can help the online platform to convey a better privacy protection image to the user, which can effectively mitigate the user's privacy concerns, increase the user's perception of trustworthiness, and further strengthen the consumer's willingness to disclose information and purchasing intention. Therefore, the privacy seal can foster more harmonious customer relationships and increase the platform's revenue from sales. Therefore, we should promote the third-party assessment organization's authentication mechanism for privacy protocols to the platform, and encourage more platforms to join the privacy agreement evaluation system. Only by fully understanding and trusting third-party assessment agencies and what they can offer to users and platforms, can we effectively establish a privacy agreement evaluation system and create a more secure and trustworthy network transaction environment.

4.3 Limitations and Future Research

(1) The sample is confined to Guangdong Province, and the population and geographical distribution of the survey are not extensive enough. Therefore, the generalizability of the conclusions of this study needs further testing.

(2) The questionnaire used in this study tests consumers' willingness to disclose information, while scholars worldwide generally believe that this dimension will be affected by perceived value, and interest perception and risk perception will affect users' perception of value. Future research should consider the influence of the privacy seal on the two sub-dimensions of interest perception and risk perception, so that findings can be more comprehensive.

(3) The questionnaire used in this study examines the overall willingness to purchase, and it considers only the privacy seal as an external influence factor, while ignoring the combined influence of other external factors and internal factors. Several scholars in China have studied the willingness to buy according to various population sectors. For example, Ji Shuzhen and others have studied purchasing intention by dividing the population, and found that trust does not significantly affect consumers who have certain shopping experience, but it can significantly affect potential consumers' willingness to buy. [28] Some academics believe that consumers who are more concerned about the privacy of information are more likely to worry about information leakage due to brand changes after they have established brand loyalty. In summary, future researches could focus on different sectors of the population, and investigate the impact of the privacy seal on the purchase intention of different user groups.

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