Research on User Privacy Information Disclosure Behavior Model in Online Medical Health Service

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Abstract. This article from the perspective of privacy computing, systematically analyzes user privacy information disclosure behavior in online medical health service, weigh the comparison of privacy risk and privacy benefit, and combine the theory of planned behavior and trust theory to construct the model of disclosure behavior of online medical health service user privacy information. Exploring the influencing factors of the users' privacy information disclosure behavior in online medical health service. It has a practical significance for the rapid development of online medical health services to study user privacy information disclosure behavior in online medical health service.

Introduction

In recent years, online medical health services have risen, and a number of online medical health service software such as "good doctor", "safe doctor" and "spring rain doctor" have emerged. Online health care services provide a channel for sharing health information between doctors with patients and between patients with patients. However, with the convenience of online medical health services, the public's concern about health information leakage and privacy security threats in the health big data environment has gradually increased, that is, users concern about whether it constitutes a privacy disclosure and disclosure level of private information during the use of online medical health services. User concerns about privacy risks will inevitably reduce user trust, which in turn affects user behavior in online health care services. Therefore, information privacy issues play a crucial role in online health care user behavior patterns. In online medical health services, user's behaviour is mainly manifested in the degree of disclosure of private information, that is, due to privacy concerns, users choose to disclose part of private information or disclose false information, and even abandon the use of online medical health services. The existing literature, which study the privacy disclosure behavior of users in online medical health services, focusing on privacy concerns, privacy risks, privacy disclosures, privacy calculations, etc. Theories involved mainly include social exchange theory, privacy calculation theory, and rational behavior theory, plan behavior theory, protection motivation theory, technology assimilation theory, trust theory, etc.

Literature Review

Review of the Status Quo of Foreign Studies.

Foreign research on online privacy information began in the late 1990s, starting with e-commerce, mobile commerce, social media and location-based services. The rise of relatively mature information privacy research has only been around for 15 years, and it has gradually expanded into the field of online medical health services.

As for the privacy information disclosure behavior of users in online medical health service, Cocosila *et al.* (2010) [1] found that the main driving factors for users to accept online medical health services and disclose privacy information are intrinsic motivation, including three dimensions: privacy, psychology and economic. Perceived risk is the main obstacle factor; Arun Rai *et al.* (2013) integrate related factors of technology acceptance models, technology assimilation theory, consumer behavior and health informatics. Exploring the user's willingness to use online health care services and the choice of privacy disclosure channels from the aspects of individual characteristics, medical service characteristics, demographic characteristics, etc. Zhang (2014) [6] et al. based on the theory of rational behavior, focusing on the role of gender regulation, explored the users behavior patterns of online medical health service, and found that males showed higher willingness to adopt online medical health services and privacy information sharing behavior than female; Li *et al.* (2016)[2] conducted research on privacy risks and privacy benefits in the use of online medical health services. The use behaviour of online health care services by individuals is determined by the trade-off between privacy risks and benefits.

A large number of studies have shown that the privacy disclosure behavior of users in online medical health service in foreign countries mainly starts from three aspects. First, the influencing factors, which include their own factors (such as demographic characteristics, personality, habits, etc.), network platform factors (such as external incentives provided by website service providers, website trust, privacy policy, etc.)and social influence factors (such as subjective norms, peer effects, etc.). Second, privacy concerns, which include pre-influence factors and its consequences. Third, privacy calculations, including privacy risks, privacy benefits, privacy protection, and privacy security, etc.

Review of the Status Quo of Domestic Research.

Compared with foreign countries, the research on privacy information disclosure behavior in China started relatively late, but it has developed rapidly. In recent years, it has achieved certain research results. At present, the application of privacy information problems in online medical health services is relatively rare. The CSSCI literature in China Knowledge Network is searched with the key words for online medical, mobile health, privacy disclosure, and private information, and there are only a dozen related literature. The literature focuses on the willingness to use mobile health care clients, the willingness to use mobile health management services, etc. Among them, regarding the research on online health information disclosure behavior, Zhang Xing et al (2016) [3] proposed an online health information disclosure willingness integration model based on the theory of planned behavior, and considered that the perceived benefit and perceived cost of online health information service users affect user privacy information disclosure attitude, while the user's information disclosure attitude, reciprocity norm and perceived behavior control affect the user's willingness to disclose information. Zhao Dongxiang (2017)[4], based on the perspective of innovation diffusion, researched the influencing factors of online health management service use. Research shows that China's online health management services are currently simplistic and primary. Information privacy and privacy concerns have not had a significant impact on the willingness to use online health services, but perceived benefits and perceived trust significantly affect the willingness to use online health services. Meanwhile, perceived privacy controls positively affect perceived benefits, negatively affecting privacy concerns. Wang Yuchao et al. (2018) [5] combined social exchange theory and trust theory, from the perspective of website service, website reciprocity norm and user trust, constructed a model of influencing factors of online medical health community health information self-disclosure willingness, which believes that trust will significantly affect personal health. Willingness to disclose private information. At present, there are few research literatures on the disclosure of privacy information in online medical health services in China, and no research system has been formed. Wang Yuchao et al. (2018) [5] combined social exchange theory and trust theory, from the perspective of website service, website reciprocity norm and user trust, constructed an influencing factors model of online medical health community health information self-disclosure willingness, which believes that trust will significantly affect the willingness of personal health private information disclose. At present, there are few research

literature on the disclosure behaviour of privacy information in online medical health services in China, and no research system has been formed.

Theoretical Basis

Privacy Calculation Theory.

Privacy computing theory explains privacy behavior from an economic perspective. It believes that users' privacy disclosure behaviour is a trade-off between vested interests and privacy disclosure risks. Through rational judgment, the privacy risk and privacy benefits are analyzed before the disclosure of the privacy information to evaluate the benefits of the disclosure of the personal privacy information, and the actual privacy disclosure behavior is determined according to the income[7].

Privacy calculations include two variables: privacy risk and privacy benefits. Privacy risk refers to the degree of potential loss when a user discloses his personal privacy information[8]. Malhotra's research confirms that privacy risks have a negative effect on user's privacy disclosure behavior[9]. Privacy benefits refer to the economic benefits, personalized services and social adjustment benefits brought by users after disclosing personal privacy information[10]. When the comprehensive index of all aspects of privacy revenue exceeds the negative impact of user privacy disclosure, users tend to choose proactive privacy disclosure behavior[11].

Planned Behavior Theory.

Planned behavior theory holds that behavioral intention is the most direct way to predict and explain individual behavior, which is influenced by behavioral attitudes and subjective normative behavioral control [14]. Behavioral attitude is an evaluation of an individual's like or dislike of a certain behavior, and is a motivational factor that affects an individual's behavior. It indicates the degree to which an individual is willing to try a certain behavior and work hard for it; Subjective norms are the social pressures an individual perceives when deciding whether to perform a particular behavior; Perceptual behavioral control is the degree of self-confidence of individuals, and it is their ability to control their behavior [14]. The stronger the intention of behavior, the greater the possibility of taking action [14]. Planned behavior theory is widely used in information management, consumer behavior, and e-commerce.

Trust Theory.

Trust theory is a social relationship, which refers to believes that others can act in a manner that is important to himself, and willing to bear the corresponding risks [12]. Trust theory is widely used in technology acceptance, social networking, online shopping, online medical and other fields. The study by Mayer et al. found that ability, goodwill, and honesty are the main characteristics of trustworthy objects [12].

Model Construction

From the perspective of privacy computing, systematically analyzes the disclosure behavior of user privacy information in online medical health service, weigh the comparison of privacy risk and privacy benefit, and combine the theory of planned behavior and trust theory to construct the model of disclosure behavior of online medical health service user privacy information. The constructed model is shown in Figure 1. Exploring the influencing factors of the disclosure behavior of users' privacy information in online medical health service. It has a practical significance for the rapid development of online medical health services to study the disclosure behavior of user privacy information in online medical health service.
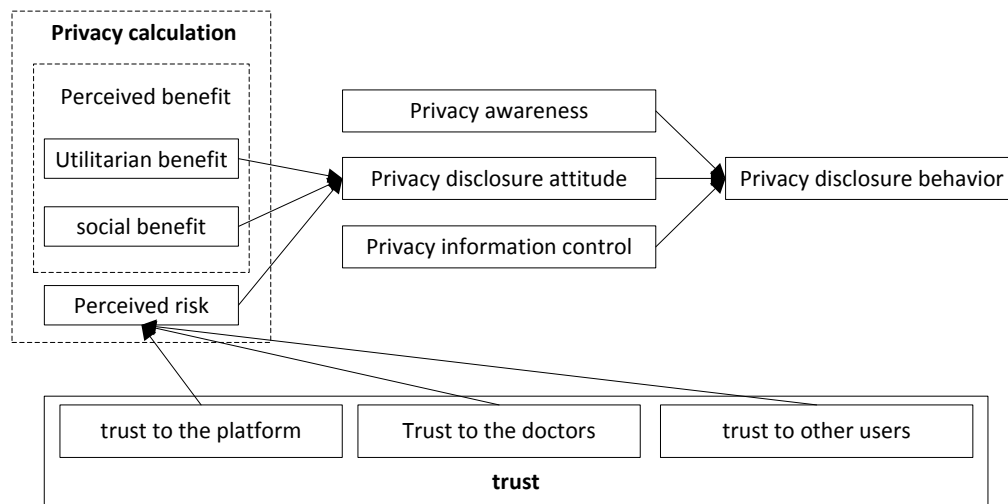
Fig. 1 Model of User Privacy Information Disclosure Behavior in Online Health Care Service

Analysis of Influencing Factors of User Privacy Information Disclosure Behavior in Online Medical Health Service

According to the theory of privacy computing, users in the online medical health service will conduct the trade-off and assessment of perceived benefits and perceived risks before conducting privacy information disclosure behaviour. Among them, perceived benefits include utilitarian benefits and social benefits. The utilitarian benefits are mainly reflected in the economic compensation that users can obtain after the privacy disclosure in online medical health service platform and personalized services in exchange for sacrificing privacy. The social benefits mainly refers to the social identity obtained and the promotion of social identity by users through the use of online medical health service platform. Both utilitarian benefits and social benefits have a certain impact on user privacy disclosure attitudes. When the sum of utilitarian benefits and social benefits obtained by users exposing private information on the online health care service platform exceeds the negative impact of user privacy disclosure, users usually choose proactive privacy disclosure behavior[11].

According to trust theory, trust in online health care services is an important mechanism to reduce uncertainty. The research of Detmer et al. indicates that low trust level of users is an important factor hindering the promotion and adoption of online health care services [12]. According to the characteristics of online medical health services, trust can be divided into three types, that is, the trust of users to the platform, the trust of users to doctors, and the trust of users to other users. The trust of users to the platform helps to enhance the user's willingness to choose and the willingness to continue to use the online medical health service platform, mainly including the trust platform to provide relevant services to the user, confidential users' health data, etc. The trust of users to doctors helps the user to provide personal health privacy data, etc. , including trust in the doctor's ability, trust in the use of the doctor's health information, etc; The trust of users to other users helps to improve interactions in online health care services and promote word-of-mouth effects. The higher the degree of trust in online medical health services, the lower the perceived risk and the stronger the willingness to disclose of users' privacy [5].

According to the planned behavior theory, the intention of user privacy disclosure in online medical health services is a key factor affecting privacy disclosure behavior. Action as an actual behavior, behavioral intentions tend to be expressed, and it directly determine the behavior when the actual control conditions are sufficient[14]. The privacy disclosure intention in online medical health services has a significant impact on user privacy disclosure behavior [5]. Privacy awareness is a clear understanding of the user's to protect their own private information, as well as a clear understanding of the degree of the consequences to reveal others' privacy information; Privacy

information control refers to the ability of users to control private information. Privacy awareness and privacy information control have a certain impact on user privacy disclosure behavior [15].

Research Significance

Theoretical Value.
Based on the perspective of privacy computing, this article integrates the program behavior theory and trust theory to study the behavior of users' privacy information disclosure in online medical health service and its protection mechanism. It has the following theoretical values: First, this article takes user behavior in online medical health service as the research object, studies the privacy information disclosure behavior in the online medical health field, and enriches the research content in the privacy information field; Secondly, from the perspective of privacy computing, this article weighs the perceived risk and perceived benefits of private information disclosure in online medical health services, and lays a foundation for the research of user behavior in online medical health service. Thirdly, this article integrates privacy computing theory, planning behavior theory and trust theory, and constructs a research model of privacy information disclosure behavior in online medical health services, which lays a foundation for the research of user behavior in online medical health service.

Practical Value.
This article conducts research on the users' privacy information disclosure behavior of online medical health service , comprehensively investigates the research results, and draws a holistic conclusion. It proposes a privacy protection mechanism for online medical health services, which is suitable for China's national conditions, and has certain practical significance. First of all, this research will help online medical health service management providers to develop marketing strategies, adopt effective service methods to serve users, and improve users' satisfaction and loyalty. Secondly, it helps online medical health service management providers to develop a website privacy policy, strengthen privacy protection for users' private information, reduce user privacy concerns, and promote users to actively disclose information. User sharing of health and privacy information can not only enrich the information content of online medical health services, but also help other users with similar health problems to understand relevant information and avoid delaying treatment. Finally, it helps users to correctly understand the disclosure of private information, reduce personal privacy concerns, and correctly guide users to recognize and use online medical health services. Promoting users' health privacy information sharing behavior in online medical health has practical significance for the rapid development of online medical health services.

Acknowledgment

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