Decisions Sciences Institute
Concern for Health Information Privacy and Reactions to Protect Health Information Privacy in EMR Context

(Full Paper Submission)

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Abstract

The study is to investigate how patients' concerns for health information privacy (CFHIP) invoke their privacy protective action in EMR exchange context. Based on the power-responsibility equilibrium perspective and privacy ecosystem concept, the research framework was developed. Data were obtained by structured interviews involving 435 residents of Taiwan and analyses reveal that seven out of nine hypotheses are supported. The implications of research findings about how the policy makers in government and hospital protect personal health information (PHI) are discussed in this study.

Keywords: CFHIP; EMR; EMR Exchange; Information Privacy; Health Information Privacy

Introduction

Electronic Medical Record (EMR) exchange among hospitals has been implemented the National Health Informatics Project (NHIP) in Taiwan. The main purposes of NHIP are reducing medical cost and improve the quality of healthcare. However, the EMR usage rate and outcome are not meet people's expectations. There are many potential reasons result in abovementioned situation. This study aims to investigate this health information related issue based on the power-responsibility equilibrium perspective and privacy ecosystem concept.
this study also works on how industry self-regulation and government legislative influence individual’s CFHIP in EMR exchange context, and what actions people will take to protect their health information privacy.

LITERATURE REVIEW

Electronic Medical Records (EMR) and EMR Exchange

EMR refers to electronic information of personal lifelong health status and health care (CPRI, 1996). An Electronic Medical Record (EMR) is a computerized health information system where providers record detailed encounter information such as patient demographics, encounter summaries, medical history, allergies and lab test histories (Ludwicka and Doucettea, 2009). Medical Records Institute (MRI) defined EMR into five stages, namely Automated Medical Records, Computerized Medical Records, Electronic Medical Records, Electronic Patient Records and Electronic Health Records (Waegemann, 1996). EMR in the 4th phase could be transacted among hospitals in the fourth stage of EMR, which is so called Electronic Patient Record (EPR). The evolution of EMR in Taiwan met the definition of the fourth stage of EMR that overcomes the geographic barriers of individual hospitals. A patient-centered, integrated personal electronic medical record information exchange platform was introduced in 2011, namely “EMR Exchange Center (EEC)”. With EEC, people can retrieve their own medical records that stored in other hospitals with their own permission to transfer the data.

Privacy, Information Privacy and Health Information Privacy

“Privacy” is the personal right to be the let alone (Warren & Brandeis, 1980). “Information privacy” means the personal ability to control their information (Stone et al, 1983). And “Health information” refers to “any information, whether oral or recorded in any form or medium, that is created by healthcare providers, health plan, employer, life insurance, school or university, or healthcare units; and relates to the past, present, or future physical or mental health conditions of an individual (HIPAA, Congress of United States of America, 1996). Health information include information such as age, gender, blood type, height, weight or publicly sensitive information, such as abortion, sexual behavior, AIDS, drug abuse, and genetic-related diseases. Health information involves sensitive individual data and more likely invokes individuals’ concerns for their health information privacy (if the information was leaked).

Concern for Information Privacy

Smith et al. (1996) identified four dimensions consist of the collection, data error, unauthorized secondary use, improper access, which are as the major factors of individuals’ information privacy concerns about organizational practices. The four primary dimensions were validated by Stewart & Segars (2002) and proposed a higher order construct. Based on related information privacy studies sand social contract theory, Malhotra et al. (2004) indicated that Internet Users’ Information Privacy Concerns (IUIPC) consisted of three dimensions: collection, control, and awareness.
Power-Responsibility Equilibrium Model

The power-responsibility equilibrium model derived from sociology and social psychology (Davis et al., 1980) that suggested that power and responsibility should be in equilibrium. According to the model, companies especially have ethical responsibilities to their customers (Laczniak and Murphy, 1993). On the contrary, if a company selects a strategy of greater power and less responsibility, customers will take defensive action to reduce the firm’s power (Caudill & Murphy, 2000; Davis et al., 1980; Wirtz et al., 2007). Ultimately, the power and responsibility between firms and customers would reach the equilibrium. Caudill and Murphy (2000) pointed out that the model could be applied in investigating the relationship between the vendor and information privacy concern of customers in online transaction.

THEORETICAL DEVELOPMENT/MODEL

Research Model and Hypothesis

This study proposed the research framework concept base on the “Privacy Ecosystem” introduced by Pitt & Watson (2007) and focused on privacy issue from the perspectives of three agents in EMR exchange context. Based on the concept of Privacy Ecosystem, “Consumer” refers to “Clinical Patient” and “Corporation” refers to “Healthcare Institutions or Hospitals” in EMR exchange situation. EMR exchange itself is not a problem to health information privacy; even so, EMR exchange raises the health personal information privacy issue with the nature of technologies. And the situation aforementioned might invoke patients’ concern for health information privacy when they interact within healthcare institutions and government. Governments’ role in this study represents to the governmental privacy related regulations, which retrain the hospital privacy related policies and supervises the use of PHI in the EMR exchange context. The two force of privacy ecosystem (the government’s regulation and the hospitals policy) will invoke people’s CFHIP and the consequent actions to protect their PHI in EMR exchange context.

Power-responsibility equilibrium model (Davis et al., 1980; Lwin et al., 2007; Wirtz et al., 2007) was also adapted in this research to address the relationship between hospital practices, regulatory forces, and individuals’ privacy concern and subsequent individual information privacy-protective responses. That is, in healthcare industry the interaction among government, hospitals and patients will reach the equilibrium point. A patient who perceives that hospitals are willing to provide PHI protective policy will have less CFHIP. Similarly, the more rigorous privacy regulations from government reduce the CFHIP of patients. Moreover, governmental privacy regulation will guide the direction of how hospitals to make their privacy policies to protect PHI. The more robust and adequate government privacy regulation and hospital privacy policy is, the less possibility that people will concerned about their EMR privacy and act to protect their health information privacy.

Son & Kim (2008) revealed internet users’ information privacy-protective responses include: refusal to provide information, misrepresentation, removal, negative word-of-mouth, complaining directly to hospitals and complaining indirectly to third-party organizations. Accordingly, this research illustrates CFHIP in EMR context is modeled as a mediating variable between hospital privacy-protective policy, government privacy-protective regulation and the effect on patients’ responses to protect their health information privacy. In other words, this work aims to understand how government privacy regulations retrain the healthcare institution
privacy policy and affect the CFHIP of patients. To investigate how people react and evoke CFHIP in EMR exchange completely, the research scope must cover the public [Everyone is a potential patient], healthcare institutions, and government. There are nine hypotheses in this research framework study (Figure 1).

Figure 1 Research Framework

**METHODS**

**Measurement Development**

The questionnaire was adapted from previous researches (Lwin et al., 2007; Malhotra et al., 2004; Milberg et al., 1995; Smith et al., 1996; Son & Kim, 2008; Wirtz et al., 2007) and with modifications according to the research purposes and context. And domain experts were invited to review the appropriateness of the research framework and questionnaire. After the questionnaire draft was modified by the experts, a pilot test was conducted to reconfirm the clearness.

**Data Collection**

The sample was selected through a quota sampling procedures. Participants in this study were contacted interviewers and invited to join this research. Participants who agreed to join this study were interviewed using a standard set of interview questions. The interview schedule was identical across all subjects. A total of 435 subjects participated in this study.
In order to improve reliability and validity confirmatory factor analysis (CFA) were conducted on the analysis of collected data. The hypotheses of this study were tested by using structural equation model (SEM) tool, SmartPLS®2.0 M3 software (Ringle et al., 2005) and the results and discussion shows in next section.

RESULTS

Demographic Data Analysis

The results of demographic analysis shows that 48.5% male subject and 51.5% female subject joined this study. 21.2% of respondents were between age 18 and 30, 44.3% of respondents were between age 31 and 50, 25.4% of respondents were between age 51 and 65, and 9.1% of respondents were above age 65. 34.5% subjects held bachelor’s degrees. The largest group of subjects earned income from NT $20,001 to NT$ 40,000 per month (38.7%).

Measurement model

The results of CFA shows the composite reliability (CR) values between 0.866 and 0.99 were greater than the acceptable cut-off point of 0.70 recommended by Bagozzi & Yi (2012), indicating an adequate level of internal consistency. Convergent validity is achieved in that the AVE values for all constructs were much higher the recommended threshold value of 0.50 (Fornell & Larcker, 1981). Discriminant validity is supported with the square root of each construct’s AVE is larger than its correlations with other constructs (Fornell & Larcker, 1981).

Structural model

After measurement model in CFA, the structural equation analysis was conducted to identify the relationships between variables. The results of PLS analysis are illustrated in Figure 2. Seven out of nine hypotheses were failed to reject at 5% level of significance. These findings support H1, H2, H4, H6, H7, H8 and H9, but not H3 and H5.
CONCLUSIONS

This study explored the relationships among environmental factors, CFHIP and six types of IPPR in EMR context based on the perspectives of power-responsibility equilibrium model and privacy ecosystem. The findings of this study suggest that comprehensive hospital policies together with a supporting legislative from government will lower individuals’ CFHIP and subsequent IPPR. This study also shows that CFHIP fully mediates the influences of hospital policy and governmental regulation on behavioral responses. We suggest that CFHIP strikes a balance within the privacy ecosystem that the interaction with hospital privacy policies and governmental regulation.

The findings in this study bring about two mainly implications for the regulation maker in government and hospital managers. To start with the governmental side, the power of technology may threaten the development of National Health Information technology. The health information privacy concern issue should be highlighted to solve those circumstances. Secondly, even if hospitals have made privacy-protective policies, public should be noticed and
empowered to engage their health information privacy. This study suggests some approaches that hospital managers could take to care about individuals who may feel their privacy rights have been threatened. The more engagement of patient in the health information privacy protection, the more power they own. Thus the equilibrium is achieved in the privacy ecosystem of EMR exchange context.

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REFERENCES

References available upon request