探討社會交換的中介效果如何影響個人分享隱私權的意願

Sharing Private information online: the Mediator Effect of Social Exchange

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致謝

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I

摘要

隨著網路資訊科技跟網路平台的快速發展，企業或公司收集個人資料及分析變得更加容易，然而許多網站使用者不願意分享個人資訊，進而降低資訊科技帶來的機會。本研究以社會交換理論來探討虛擬社群中使用者對於分享個人資訊的意圖之研究。本篇研究獨特的地方是以使用者對於社會交換的態度當作中介因子，對於社會交換的態度會中介使用者的信任及隱私權認知到分享個人資料的意願。並且收集大規模的樣本數實證資料來驗證這篇研究的理論模型，這篇研究以問卷法進行資料蒐集，共蒐集 1269 份樣本，使用 LISREL、SPSS 進行 SEM 資料分析，檢驗本研究模型與相關假說。研究結果強烈支持假設，使用者對於社會交換態度存在部分中介效果，信任對於使用者分享個人資料的意向具有強烈的正向直接跟間接效果。使用者的隱私權認知到分享個人資訊的直接效果是負向高度顯著，然而有趣的是使用者透過社會交換態度的間接效果卻是正向。此外，根據虛擬社群的種類進行干擾效果檢定，發現不同目的虛擬社群具有干擾效果，在興趣型（Mobile01）的網站中，使用者對於社會交換態度沒有達到顯著，而交易型、關係型及幻想型網站均有達到顯著標準。

關鍵字：隱私權認知;信任;社會交換;分享個人資料;虛擬社群

ABSTRACT

Advances in information technology facilitate extensive collection and analysis of personal information for the purpose of strategic use by websites or companies. However, the typical reluctance of web users in sharing personal information significantly reduces such opportunity enabled by information technology. Therefore, the purpose of this research is to construct and empirically assess a causal model that explains how web users intend to share their personal information online. In particular, this theoretical model proposes that social exchange attitude mediates the impacts of trust and privacy concern on the intention of sharing personal information. A large sample (N=1269) is collected to test the proposed model. The empirical data strongly supports the hypotheses and suggests that trust and concern for privacy directly and indirectly affects the intention to share personal information via the attitude of social exchange. The direct and indirect impacts of trust are both positive. On the other hand, the direct impact of concern for privacy is negative, whereas the indirect impact is positive. Furthermore, this study also examined the moderator effect of four types of virtual community.

Keywords: Trust; Concern for Privacy; Sharing personal information; Social exchange; Virtual community

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1. Introduction:

1.1. Background and Research Motivation

Private information such as users' name, birthday, address, and credit card number are necessary for almost all online commercial transactions, and more detailed information about online behavior of users' is crucial for Web manager to customize and personalize. However, not all users are willing to give out their information, and many users are shying away from requests of privacy from websites. Additionally, Hoffman reported that almost 95% of web users have at least once rejected to give their private information to websites at one time or another when asked and 40% of users have ever provided fabricated demographic information(Hoffman, Novak et al. 1999; Phelps, Nowak et al. 2000)
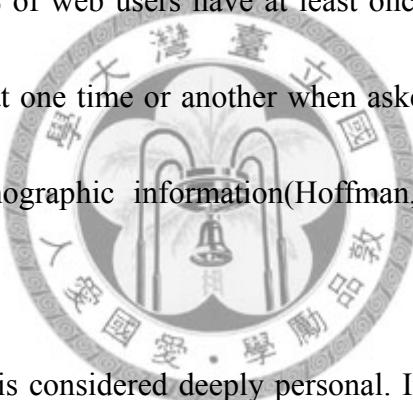
Revealing privacy is considered deeply personal. In one respect, it asks someone to give some information that reveals his or her behavior in daily life. The term share is an exchange of information between individuals, within groups or companies. Some users of online communities are very enthusiastic about the sharing. Most web users are worried about that once privacy is released and accessed unperceivedly by third parties or hackers, their personal information will be abused to complete financial transactions, such as credit card debts, and financial loans. For example, identity theft is also a serious problem for online users, because someone stealing your identity account may behave in

socially undesirable and harmful ways or commit crimes over Internet(Berghel 2000).

Therefore, personal information is usually regarded as a unique asset which is possessed

by people, and precious knowledge that is difficult to obtain. The advent and increasing

popularity of online community heralds a great change and how to manage personal data

of large populations from online users all over the world become a current research issue.

Furthermore, one of important factors is that online communities should stick their

members, which means let web-users revisit the site frequently and spend much time

exploring the website. How can online communities attracts web users and lure them to

revisit the communities frequently becomes an issue for its IS managers and companies.
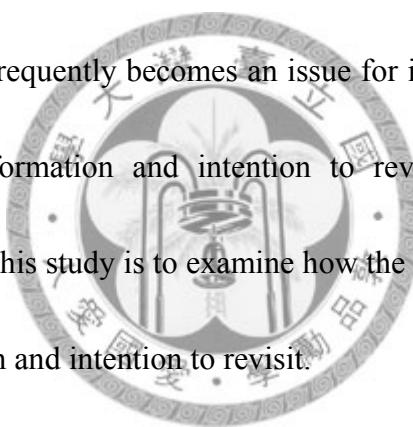
Given that personal information and intention to revisit are crucial for managing

websites, the purpose of this study is to examine how the web users are willing to release

their personal information and intention to revisit.

Additionally, the relation between concern for privacy and information disclosure is

also proved that Internet users' privacy concern will negatively predict their intention of

releasing personal information. (Culnan 1993; Wang 1998; Liu, Marchewka et al. 2005;

Dinev and Hart 2006; Dwyer, Hiltz et al. 2007) While privacy is a highly cherished value,

individuals make cost-benefit trade-off in which they surrender a certain degree of

privacy in exchange for outcomes perceived to be worth the rewards of information

disclosure.(Dinev and Hart 2006) That is, users are considered sharing privacy as a result

of cost-benefit analysis, such as calculation of possible risks and feedback of the

disclosure. As reported in Westin's research , the concern for privacy and perceived risks are the frequently cited and major reasons for users declining to share private information online(Westin 2001). Therefore, if there exists any possible reward, web users may be attracted by the rewards and encourage them to think about the benefits of disclosure and to evaluate to complete the transactions or not. From other respective, there is a great deal of research suggested that trust strong and positively relates to the intention to share personal information(Hoffman, Novak et al. 1999; SL Jarvenpaa, N Tractinsky et al. 1999; Jarvenpaa, Tractinsky et al. 2000; Metzger 2004; Dinev and Hart 2006).(Jarvenpaa, Tractinsky et al. 2000) The powerful influence of trust explains why the information sharing exists despite revealed concern for privacy.
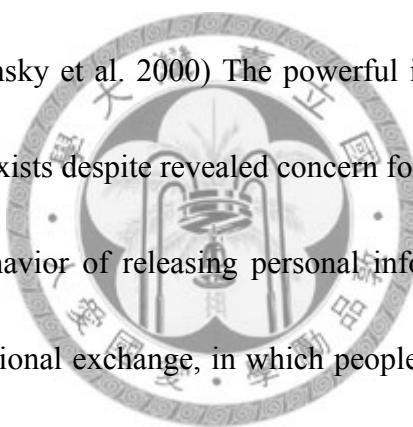
As a result, the behavior of releasing personal information can be regarded as a continuous process of rational exchange, in which people agree on the certain degree of privacy in exchange for feedbacks which are perceived to be worth the information disclosure. Exchange is usually a one-time shot interaction with the websites or web users. Or with the further development, it can be an iterative interaction of social exchange between two parties, just like the same concept of relationship marketing, which focuses on a long-term relationship and keeps a series of interactions with the consumers. After interactions, user might have positive or negative attitude toward community to determine to enhance or weaken their relationship by their experience.

During the interactive process of social exchange, the exchange partners take

recurring, mutual, and reciprocal gains into consideration rather than short-term risks or benefits. When web users are willing to give out their private information, they expect to receive something for feedbacks in return. Social exchange comes out when the exchange partners have the valued resources for each other. Once the exchange partners receive resources which they expect and want, a higher degree of concern for privacy could be surrendered to acquire further exchange. That is to say, the behavior of sharing personal information could be explained with a perspective of social exchange.

According to previous studies, there is no research to explain the relationship between trust, and information disclosure, and the relationship between privacy concern and information disclosure with a perspective of mediator of Social Exchange. What is more, that whether the mediator of social exchange affects the relationship on intention to revisit or not is also one of our examinations. This research applies the concept of social exchange, one of most influential conceptual paradigms in organizational behavior, into our model and attempts to better understand the predictors of users' revealing or surrendering personal information.

In particular, the advent of Internet as a computer-mediated communication (CMC) medium has led to the emergence of a popular social phenomenon: online communities. Virtual communities are changing the human fabric of the Internet and have the potential to make a great investment. While many web designers attempt to build and initiate these online communities, such as ecommerce-based or knowledge sharing mechanisms, have

been successful in recent years.(Preece 2000) According to online web users' demands and interests, virtual communities can divide into four type of community: Transaction, Interest, Relationship and Fantasy. As traditional thinking, economic exchange leads the transaction-based virtual community function well, and social exchange maintains the function of relationship-based communities. These four types of communities feature their unique purpose. Notwithstanding, according to past research, we find that web users make cost-benefit trade-offs, instead of evaluation purely on an economic view, and users' cost-benefit analyses also take noneconomic factors into considerations and engage in relationship exchanges on the online communities include both an economic and a social contract. (Hoffman, Novak et al. 1999) The major concept of social exchange is to build a long-term relationship with exchange partners. Hence, social exchange may occur in all kinds of virtual communities. This research wants to not only examine the features of online users and the users' belonging to what kind of virtual communities, but also investigate that the level of social exchange effect how to differentiate within four dissimilar purposes of online communities.

This study aims at examining a causal model on online information disclosure in virtual communities. In particular, we will investigate: 1) why the community member is willing to exchange their privacy for rewards, and 2) how the social exchange mediates the relationship in this model. Based on social exchange theory, the model examines the

role of trust and concern for privacy (e.g. self-disclosure in interpersonal contexts) on intention toward privacy exchange in the virtual community. The model will be deployed to four virtual communities to be tested. To examine the differences among dissimilar communities and explore how users reveal their personal information to others.

1.2. Research Purpose

The purpose of this research is to construct a causal model that can explain the relationship among privacy concern, trust, attitude toward social exchange, release information intention and intention to revisit. We propose a theoretical model in which attitude toward social exchange is a mediator among trust and privacy concern and release information intention .Our contributions can explain that why people are willing to exchange their personal information to individuals or firms and confirm attitude toward social exchange mediates the relationship between trust and information disclosure, especially, the indirect effect on concern for privacy.

In the remainder of the thesis, we structured as follows. In chapter 2, we summarize and infer literature reviews, propose our hypotheses, and explain our conceptual model. Chapter 3 describes methodology including sampling method, measurement development, and analysis method. We will discuss our finding and implications.

2. Literature Review

2.1. Trust

Mayer, Davis et al.(1995) defined trust is "the willingness of a party to be vulnerable to the actions of another party based on the expectation that the other will perform a particular action important to the trustor, irrespective of the ability to monitor or control that other party". Distinctive to the concept of concern for privacy, trust reflects the positive belief that the exchange partners will behave on the basis the of" Goodwill" towards the trustor. However, these two factors are not just two extremes sides because lack of concern for privacy is not equal to trust. Trust is the foundation of knowledge transfer. It is a psychological state, when people feel confident about sharing ideas, experiences, and relationships with others.

Hoffman (1999) also indicates that 63% of Internet users who at least once have declined to give their information to Web sites. The major reason that people have yet to share or provide information to web providers in exchange for access to service or information, is the fundamental lack of faith between most Web providers and users on the Web today(Jarvenpaa, Tractinsky et al. 2000).

Prior research has shown that trust is not only a critical determinant of sharing information and developing new relationships, but also plays important role for successful online interaction (Morgan and Hunt 1994; Fukuyama 1996; SL Jarvenpaa, N Tractinsky et al. 1999; Coppola, Hiltz et al. 2004). Online consumers prefer to do business with

Websites that they perceive to have the trust-related qualities, such as reliability, helpfulness, altruism, consistency, competence, fairness, integrity, responsibility, benevolence, and ability (Mayer, Davis et al. 1995). That is, trust can increase the likelihood of user engaging in online transactions and interactions. Furthermore, studies of interpersonal exchange situations also confirm that trust is a major key antecedent for self-disclosure, because it reduces users' perceived risks involved in revealing private information, and makes users feel reliable, intention to revisit, enhance user' satisfaction, and encourage users to build long-term inter-organizational interactions(Metzger 2004). High trust would lead to a perception of low cost, and vice versa.

In sum, it is reasonable to hypothesize that users' willingness to release their personal information online will increase with a higher level of trust. Hence, trust can affect users' attitude toward communities as well, which means user' intention to revisit will have positively relationship with trust.

Hypothesis 1a: Trust positively affects the intention to revisit.

Hypothesis 1b: Trust positively affects the intention to share personal information online.

2.2. Concern for Privacy

Privacy is usually described as "the right to be let alone," and is related to autonomy, secrecy, and solitude. However, when associated with activities that happened in the arena of the Internet environment, privacy right is the right to control one's own exposure

conditions (James 1975; Chen, Chen et al. 2008)and able to control the release of his or her

private information.(Liu, Marchewka et al. 2005)

Prior research has different measurements on privacy concern. For example,

Culnan(1993) adopted different measurements, including general concern for privacy,

loss of control, and unauthorized secondary use of personal information. However, Smith

and Milberg (1996) developed and validated an instrument that identifies and measures

the primary dimensions of individual's privacy concern. They summarized four central

dimensions of individuals' concerns about organizational information privacy activities:

(1.) collection of personal information; (2.) internal and external unauthorized secondary

use of personal information (3.) errors in personal information; (4.) improper access to

personal information.
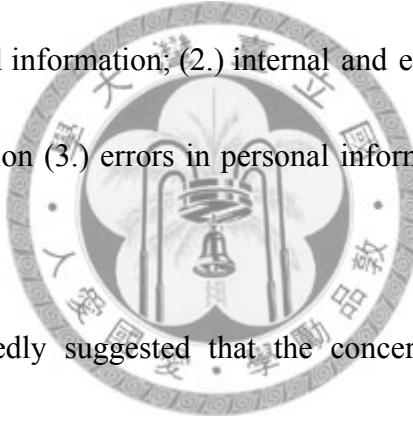
Past studies repeatedly suggested that the concern for privacy has a negative

relationship with personal information sharing. There is still inherent fear that once

privacy is released, the rights of person will be infringed or violated. Such fear and

reluctance leads to that when registering for websites, people often have kept their

privacy secretly, less frequently and providing incomplete information (Culnan 1993;

Wang 1998; Liu, Marchewka et al. 2005; Dinev and Hart 2006; Dwyer, Hiltz et al. 2007).

As mentioned above, it is hypothesized that web users' general concern for online privacy

will negatively affect users' intention to share their personal information to websites, as

stated in Hypothesis 2.

Hypothesis 2: Concern for privacy negatively affects the intention to share personal information online.

2.3. Attitude toward Social exchange

Social exchange referred to reciprocal acts of benefit, in which individuals offer some kinds of resources to another with the expectations of future return(Molm, Takahashi et al. 2000). Possible resources in exchange include love, status, information , money, goods and services (Cropanzano and Mitchell 2005). Similar to a typical business transaction, the actors in a typical social exchange conduct a cost benefit analysis whether to engage in social transactions or not. When the exchange is considered to be beneficial, then the individuals are likely to enter into an exchange relationship.
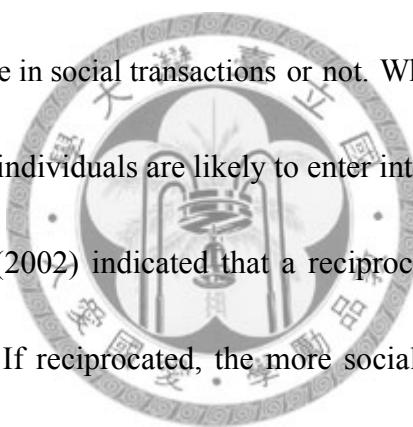
The work of Molm(2002) indicated that a reciprocal exchange results in a closer relationship with others. If reciprocated, the more social exchange complete, the more quality of relationship improve. According to GVU7[th] WWW survey, online users do not view their personal information as economic exchange merchandise. That is, online users do not perceive sharing private information in terms of selling it to obtain monetary incentives. Instead, they want another type of exchange which features as explicit social exchange executed in the context of cooperative relationship(Cropanzano and Mitchell 2005).

Therefore, instead of focusing on short-term rewards, social exchange focuses on long term, recurring mutual benefits(Sheehan and Hoy 1999). The long-term relationship

built by the partners of social exchange is based on mutual dependence, and expectations of future return. However, such expectations entail unspecified obligations, regarding when and in what form the return will be realized. The actors enter social exchange without knowledge of whether or when the other will reciprocate. Therefore, the partners estimate how the others will act and determine how to interact with each other. If the estimation is positive, that means the partners have trust towards each other. On the other hand, if the estimation is negative, concerns for possible risks surface.

Similarly, online users could engage in social exchange when they interact with the web sites or other users online. As argued by Hoffman(1999), even on the Web, consumers decide to engage in commercial transactions on the basis of relational factors(Hoffman, Novak et al. 1999). Social exchange usually starts with an offer of resources, which incurs resources returned from the other side, according to the principle of reciprocity. In the context of online information sharing, such social exchange can start with sharing impersonal information, which induces a virtual cycle of interaction and can possibly lead to sharing personal information.

As we discussed, social exchange involves rational analysis of cost-benefit resulted from the social interaction. In the contexts of online interaction, the individuals can make a cost-benefit evaluation based on their trust and concern for privacy when deciding whether to engage in a long-term interaction and build an exchange relationship. Trust is also a central component of social exchange theory, especially in interpersonal

communication research (Roloff, 1981). As prior research indicated, trust is a critical determinant of sharing information and developing new relationships(Fukuyama 1996).

Trust also determine the amount and type of control one has in a relationship(Cropanzano and Mitchell 2005). Indeed, several studies of interpersonal exchange situations have confirmed that trust is a precondition for self-disclosure because it reduces the perceived risks involved in revealing private information (Doney and Cannon 1997; Molm, Takahashi et al. 2000; Luo 2002). The users are willing to share their personal information to those who belong to the same online community. For example, according to the research of Dwyer(Dwyer, Hiltz et al. 2007), they found that members of Facebook were more willing to share identifying information to each other than them members of other communities. Most users prefer to make long-term relationship with the community, so that they could share interests and activities. Constructing long-term relationships with community involves many emotion factors, including trust, belongings, a sense of fulfillment, and a level of social status.

Therefore, it is logical to infer that trust helps online users to engage in social exchange, which further leads to privacy disclosure and intention to revisit, as stated in the following hypotheses.

Hypothesis 3a: Trust affects social exchange attitude, which further mediates the effect on the intention to revisit.

Hypothesis 3b: Trust affects social exchange attitude, which further mediates the

effect on the intention share personal information online.

Besides trust, concern for privacy is essential in the context of online interaction. In essence, users simply do not trust most web providers enough to engage in relationship exchanges and knowledge exchange involving money and personal information with them(Jarvenpaa, Tractinsky et al. 2000). The reason why a lot of people have yet to share personal information to web providers in exchange for access to service or information, is the fundamental lack of faith on the websites today. So far, the past research has focused on the direct effects of concern for privacy on intention to share information. Culnan(1993) indicates that control that emerges as a clear theme in differentiating individuals with positive overall attitudes toward secondary information use from those with negative attitudes(Culnan 1993). However, there exists a paradoxical gap between such frequently cited concerns of privacy and the actual behavior engaged in the interaction online(Ackerman, Cranor et al. 1999; Sweat 2000). One possible reason is people try to verify their concerns through actual interaction with others online, starting from something from sharing something less significant. An individual's concern for privacy is likely to vary during g the process of his or her lifetime due to the cost-benefit. People always utilize the desire for privacy to turn the tap by which we regulate where we are, or want to be. Berscheid also agreed that individuals differ in the degree to which they want and value personal control over information about themselves(Berscheid 1977). Therefore, even though concern for privacy has negative impacts on revealing personal

information, it could incur social exchange for exploring a chance of possible mutual benefits through iterative interaction and understanding. As such, we propose that concern for privacy will have positive impacts on attitudes of social exchange, which further affects the intention to share personal information. That is, we propose that attitude toward social exchange plays the role as the mediator between the relationships concern for privacy and the personal information disclosure intention and intention to revisit, as stated in Hypothesis 4a and Hypothesis 4b.

Hypothesis 4a: Concern for privacy affects social exchange attitude, which further mediates the effect on intention to revisit.

Hypothesis 4b: Concern for privacy affects social exchange attitude, which further mediates the effect on the intention share personal information online.

As previous mentioned, virtual communities are changing the human daily life with Internet. Armstrong and Hagel (1996) indicated the Internet offers a social and economic opportunity for users and web managers. In online communities, users have different purposes and needs when they join the online communities. Virtual communities include diversified services for their users. According to users' demands and interests, virtual communities can divide into four type of community: Transaction, Interest, Relationship and Fantasy.

1. Communities of transaction (ex: Yahoo Shopping) facilities the buying and

selling of goods or services and provide the platform to their users. Participants will be

encouraged to interact to make well-information purchase decisions.

2. Communities of Interest (ex: Mobile01, which focused on 3C products topics

with highest users reach proved by Alexa in Taiwan) bring together participants who

interact extensively about specific topics of interest. Participants usually don't carry out

transactions with others, but their interactions are generally focused on a specific topic

area.

3. Communities of fantasy (WOW, massively online role-playing game by Blizzard

Entertainment) allow participants create new personalities, environments or stories of

fantasy. Therefore, individual can play an imaginative or factual being and act our roles

like members of communities.

4. Communities of relationship (ex: Facebook, a free-access social networking)

center on intense personal experience. When people join social networking sites, they

begin by creating a profile, then make connections to existing friends as well as those

they meet through the site(Armstrong and Ill 2000).

As mentioned above, online communities have various developments and provide

their major selling point services. However, these four sorts of communities are not

mutually exclusive, and they still have something in common, such as online social norm,

and trust. According to past research, web users make cost-benefit trade-offs which take

noneconomic factors into considerations and engage in relationship exchanges on the

online communities include both an economic and a social contract. (Hoffman, Novak et al. 1999) Therefore, in this study, we want to conduct exploratory research to examine whether the features of community differentiate the direct and indirect impact on proposed model or not.

Hypothesis 5: The different types of community have moderated the relationship from trust and concern for privacy to intention to share private information and intention to revisit.

2.4. Research Model:
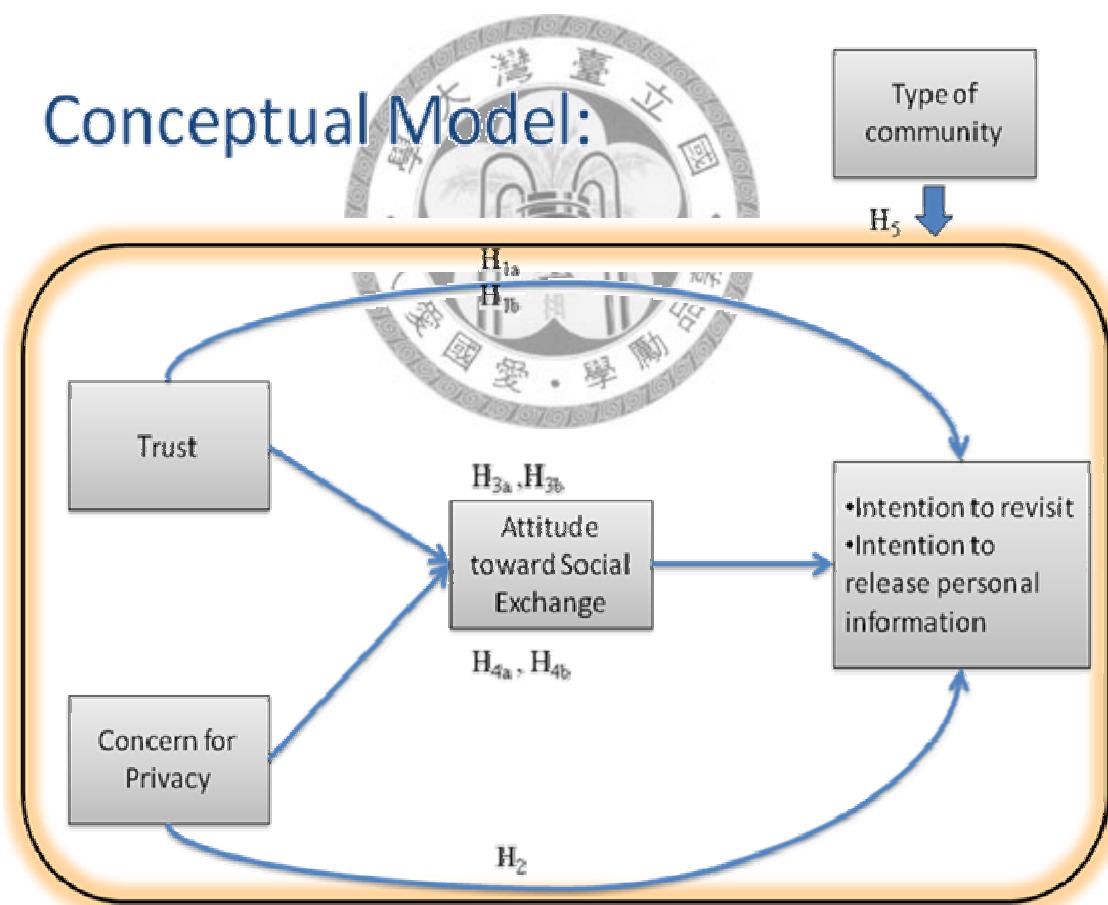
Figure 1 : Research Model

Based on the related literature, a research model is depicted as Figure 1.This model

includes two factors: trust and concern for privacy, which suggests that both trust and concern for privacy will impact the willingness of individuals to exchange their rewards on exchange ideology. And through the mediating effect of the attitude toward social exchange, users' personal information disclosure intentions and intentions to revisit can be better predicted. In addition, concern for privacy might also influence the personal information disclosure intentions trade-off. The model will be deployed and tested on four virtual communities to examine the moderator effect. With result of moderator effect, we can distinguish the indirect and direct effect on four types of virtual communities. The measurement models and the structure models will be tested with data collected from the members of each virtual community.

3. Research Methodology

3.1. Sampling Method:

A survey was conducted to assess the measurements of concern for privacy, trust, attitude toward social exchange, intention to share personal information and intention to revisit in four popular online communities for our study: 1.Yahoo shopping (community of Transaction), 2.Mobile01 (community of interest), 3.Facebook (community of relationship), and 4.WOW (community of fantasy). To enhance quality of the research and make results more reliable, we will post information about this research through blogs, online forums, and bulletin board system (BBS) to recruit more respondents. All respondents had to be the members of at least one of four communities. And subjects voluntarily complete the survey online or will be invited to the laboratory in person. To encourage participants to answer the questions honestly, we will give each subject rewards, USD3, and give written assurances that their individual responses would be kept confidential. There were total 1419 participants to complete the questionnaire, and there were 1269 (89.4%) valid surveys (number of respondents of each type community: Yahoo shopping:451, WOW:419, Facebook:201, Mobile01:199). The final survey respondent profile (total sample size=1269) is given in Table 3-1.

Table 3-1: Descriptive Statistics of Survey Respondents (N= 1269)

Gender		Occupation	
Male	829(65.3%)	Student	751(59.2%)
Female	440(34.7%)	Teacher	41(3.2%)
Marital Status		Information industry	101(8.0%)
		Financial Industry	16(1.3%)
Single	1223(96.4%)	Mass media industry	15(1.2%)
Married	46(3.6%)	Service Industry	69(5.4%)
Type of Communities		Military and Police	22(1.7%)
		Civil Service	30(2.4%)
Yahoo Shopping	451(35.5%)	Freelancer	46(3.6%)
Moble01	199(15.7%)	others	178(14.0%)
WOW	418(32.9%)		
Facebook	201(15.8%)		
Age		**Education**	
<12 years	0(0%)	Junior High or less	6(0.5%)
13-14 years	4(0.3%)	High school	41(3.3%)
16-18 years	28(2.2%)	College	25(2%)
19-22 years	690(54.4%)	Bachelor's Degree	826(65.1%)
23-30 years	488(38.5%)	Graduate degree	371(29.2%)
31-40 years	60(4.7%)		
>50 years	2(0.1%)		
Community you spend most time		**Average amount time spent in each visit**	
Transaction	85(6.7%)	less than 0.5 hr	166(13.1%)
Relationship	266(21.0%)	0.5~1hr	426(33.6%)
Interest	621(48.9%)	1~2 hrs	317(25.0%)
Fantasy	297(23.4%)	2~3 hrs	151(11.9%)
		more than 3hrs	209(16.5%)

3.2. Measures

To test the proposed model, scale to measure each of the constructs in the model were developed based on previous literature and using existing scale where possible. Except where noted, perception of respondents were measured using a Likert scale ranging from 1 to 7, with "1" for strong disagree and "7" for strongly agree.

3.2.1. Concern for Privacy

Concern for privacy is tested, multidimensional construct(Smith and Milberg 1996).They take use of four measurements to access.(1)Collection" subscale: Concern that extensive amounts of personally identifiable data are being collected and stored in database.(2)Errors" subscale: Concern that protections against deliberate and accidental errors in personal data are inadequate.(3)Unauthorized Secondary Use subscale: Concern that information is collected for one purpose but is used for another, secondary purpose after disclosure to an external party(not the collecting organization).(4)Improper access" subscale: Concern that data about individuals are readily available to people not properly authorized to view or work with this data.16-items scale was selected by two professional expects to measure privacy concern, and the 16-item is shown in Appendix.
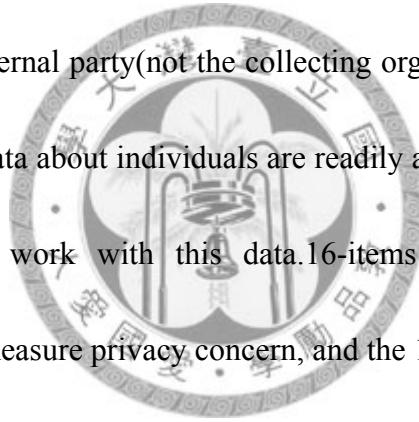
3.2.2. Trust

The objective was to capture trust as many different aspects of ability, integrity, and benevolence that might apply to online users.(Gefen 2002) As in Mayer et al.(1995) and Davis(1999), integrity was conceptualized as adherence to appropriate accepted rules of conduct, benevolence as a willingness "to do good"(Mayer and Davis 1999) for the users, and ability of appropriate skills, such as knowledge and competence.

The items of integrity and the items of benevolence are revised to fit our research model. However, the original items of ability are too general, so according BS7799, a

standard originally published by the British Standards Institute (BSI) in 1995- Code of

practice for information security management; we revised 10 categories(Business

Continuity Planning, System Access Control, System Development and Maintenance,

Physical and Environmental Security, Compliance, Personal Security, Security

Organization, Computer and Network Management, Asset Classification and Control,

and Security Policy) to specify this questionnaire.23-items scale was selected by two

professional expects to measure trust, and the 23-item is shown in Appendix.

3.2.3. Attitude toward Social Exchange

Social exchange referred to reciprocal acts of benefit, in which individuals offer

resources, help, advice and another without negotiation of terms and without knowledge

of whether or when the other will reciprocate in the future (Molm, Takahashi et al.

2000).Social Exchange theory is similar with Fiske's relationship theory (Fiske 1993;

Heyman and Ariely 2004). We revised the items of questionnaire to fit our research.

11-items scale was selected by two professional expects to measure trust, and the 11-item

is shown in Appendix.

3.2.4. Intention to share personal information and revisit

Research presented a model that suggested behavior intentions was suitable

dependable variable to be used to measure the effectiveness.(Liu, Marchewka et al. 2005)

We revised and separate these measurements into two dependent variables to access our

purpose of this research. 3-item scale was selected by two professional expects to

measure intention to share private information, and 2-item scale was also selected by two

professional expects to measure intention to revisit. All 5 items are shown in Appendix.

3.3. Analysis Method:

We will employ the SPSS 12.0(Statistics Package for Social Science), LISREL8.54

(Joreskog and Sorbom 2000) to perform structural equation modeling (SEM) and help us

analyze the collected data.

First, all the questions were translated into Chinese and back translated into English

by three people and revised several times with professional expects. A pilot study was

performed on 66 participants and each of them was interviewed to assure the clarity and

completeness of the word semantic in the survey questions. Modifications and

refinements were made based on the pilot test. The final set of question items used for

the survey was shown in Appendix.

Second, the construct validity of the model's scales is evaluated using confirmatory

factor analysis (CFA) and conducted by LISREL 8.54. We will present seven common

overall model fit indices: $\chi^2/ $(d.f) ,GFI, AGFI, NFI, NNFI, CFI, RMSEA. Third, examine

the factor loadings of the model variable items on their underlying constructs for

construct validity and examine the reliabilities. Finally, test the structural model and

examine the mediator of attitude toward social exchange and the moderator of types of

community.

4. Result

4.1. Exploratory Factor Analysis (EFA)

Exploratory Factor Analysis was conducted before the survey. The Kaiser-Meyer-Olkin (KMO) coefficient (0.963) and $\chi^2_{(1378)}$(41397.288) for Bartlett's shpericity test(p<.000) show the efficiency of the proposed model. These explained 68.33% of total variance, as shown in Table 4-1.

Table 4-1 Exploratory Factor Analysis (EFA)

Factor	Item	1	2	3	4	5	6	7	8	9	10	11	12
Collection	pco1	.82											
	pco2	.84											
	pco3	.71											
	pco4	.84											
Error	per5		.77										
	per7		.77										
	Per37		.70										
Unauthorized Secondary Use	Pun38			.81									
	Pun39			.85									
	Pun40			.86									
	Pun41			.87									
Improper access	Pim42				.76								
	Pim43				.69								
	Pim44				.82								
Integrity	tin8					.42							
	tin9					.54							
	tin10					.71							
	tin11					.76							
	tin12					.63							
	tin13					.67							
	tin14					.76							
Benevolence	tbe15						.77						

Construct	Item	F1	F2	F3	F4	F5	F6
	tbe16	.80					
	tbe17	.79					
	tbe18	.66					
	tbe19	.73					
	tbe21	.68					
	tbe20*						-.51
Ability	tab22		.46				
	tab24		.76				
	tab25		.75				
	tab26		.64				
	tab27		.79				
	tab28		.48				
	tab29		.72				
	tab30		.68				
Intention to revisit	Bpo31	.75					
	Bpo33	.81					
Intention to share personal information	Bin34			.47			
	Bin35			.73			
	Bin36			.67			
Communal Sharing	Sco45				.59		
	Sco46				.79		
	Sco47				.77		
	Sco48				.70		
	Sco49				.77		
	Sco50				.78		
Equality Matching	Seq51					.75	
	Seq52					.70	
	Seq53					.53	
	Seq54					.77	
	Seq55					.69	
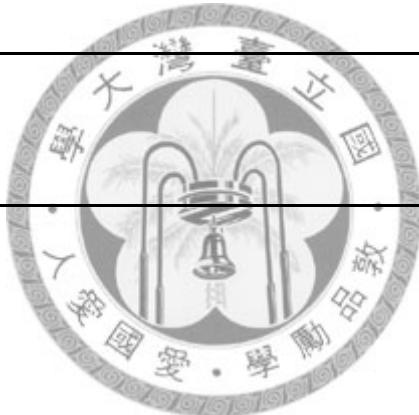
Three reverse-score items (per6, tab21, and tbe20) were dropped from the analyses due to their resulting decrement in the internal reliability of the subscale. The respectively value of Cronbach's alpha for the four constructs was: Trust was 0.957, Concern for privacy

was 0.951, Attitude toward social exchange was 0.906, intention to revisit was 0.731, and

Intention to share personal information was 0.705. Overall, the Cronbach's alpha of all the

constructs were exceeded 0.7, and all measurements present good fit.

Reliability and validity of the measures:

Confirmatory factor analysis (CFA) was performed to assess the reliability and validity

of the measures. As Table 4-2 shown, the Cronbach's alpha values of all the constructs

exceeds the 0.7 threshold(Nunally and Bernstein 1978). The Cronbach's alpha of composited

questionnaire is 0.918. The results suggest that the measurement has adequate item reliability

and composite reliability. In addition, the average variance extracted (AVE) across the

constructs exceeds the 0.5 benchmark (Fornell and Larcker 1981).

Table 4-2: Results of factor analysis

Construct	Subscale	Item	Factor Loading	t-Value	AVE	α
Concern for Privacy	Collection	pco1	.76	26.77	**.73**	**.86**
		pco2	.79	27.72		
		pco3	.66	22.71		
		pco4	.85	26.77		
	Errors	per5	.75	14.72		
		per7	.62	14.72		
		per37	.64	14.86		
	Unauthorized Secondary Use	pun38	.80	36.26		
		pun39	.86	42.27		
		pun40	.90	26.99		
		pun41	.91	41.11		
	Improper access	pim42	.75	24.69		
		pim43	.71	23.33		
		pim44	.84	26.05		

Trust	Integrity	tin8	.68	20.36	**.67**	**.95**
		tin9	.76	23.03		
		tin10	.84	24.99		
		tin11	.87	25.94		
		tin12	.57	17.66		
		tin13	.63	19.4		
		tin14	.78	23.51		
	Benevolence	tbe15	.84	34.03		
		tbe16	.85	35.45		
		tbe17	.83	33.6		
		tbe18	.69	25.93		
		tbe19	.80	32.3		
		tbe21	.75	28.82		
	Ability	tab22	.76	28.06		
		tab24	.81	28.6		
		tab25	.83	29.52		
		tab26	.65	22.38		
		tab27	.84	30.03		
		tab28	.59	19.93		
		tab29	.85	30.57		
		tab30	.77	57.03		
Attitude Toward Social Exchange	Communal Sharing	sco45	.65	17.89	**.59**	**.83**
		sco46	.76	20.79		
		sco47	.76	20.79		
		sco48	.77	20.98		
		sco49	.53	15.38		
		sco50	.58	16.61		
	Equality Matching	seq51	.59	16.62		
		seq52	.74	17.38		
		seq53	.69	26.69		
		seq54	.69	16.78		
		seq55	.69	16.69		
Intention to revisit		bpo31	.70	17.69	**.78**	**.86**
		bpo33	.81	10.16		
Intention to share personal information		bre34	.52	13.58	**.55**	**.70**
		bre35	.90	4.16		
		bre36	.49	4.07		

Moreover, as shown in Table 4-3, the average variance extracted, as indicated on the

diagonals, in each of constructs exceeds the inter-correlations of the corresponding constructs.

The results show that the measurement has an adequate level of convergent and discriminant

validity. Given that the measurement has sufficient reliability and validity, we can proceed to

test the proposed model against the data.

Table 4-3: Means, standard deviations, correlations, and AVE of the constructs

Variable	Mean	Std. Deviation	1.	2.	3.	4.	5.
1. Trust	4.1777	1.0054	(.67)				
2.Concern For Privacy	6.0616	0.6489	-.148**	(.73)			
3.Attitude toward Social exchange	5.2884	0.8405	.268**	.283**	(.59)		
4.Intention to revisit	5.5808	1.0191	.406*	.054	.366**	(.78)	
Intention to share personal information	3.4392	1.2156	.555**	-.295**	.167**	.242**	(.55)

Note: the diagonals represent the average variance extracted (AVE)

**Correlation is significant at the0.01 level (2-tailed)

4.2 Testing the proposed model

Testing of Attitude toward Social exchange mediating effects

According to Anderson and Gerbing's(1988) nested model approach, we tested three competing models for the relationships between trust, concern for privacy and the intention to share personal information: the non-mediated model (model 1), the fully mediated model (model 2), and the partially mediated model (model 3). Each model is shown in Figure 2. In the non-mediated model, there are only direct effects assumed for trust and concern for privacy onto the intention to share personal information. In the fully mediated model, the effects of trust and concern for privacy on the intention to share personal information are indirectly mediated through the attitude toward social exchange. On the other hand, in the partially mediated model, trust and concern for privacy affect the intention to share personal information both directly and indirectly through the mediator of social exchange attitude.
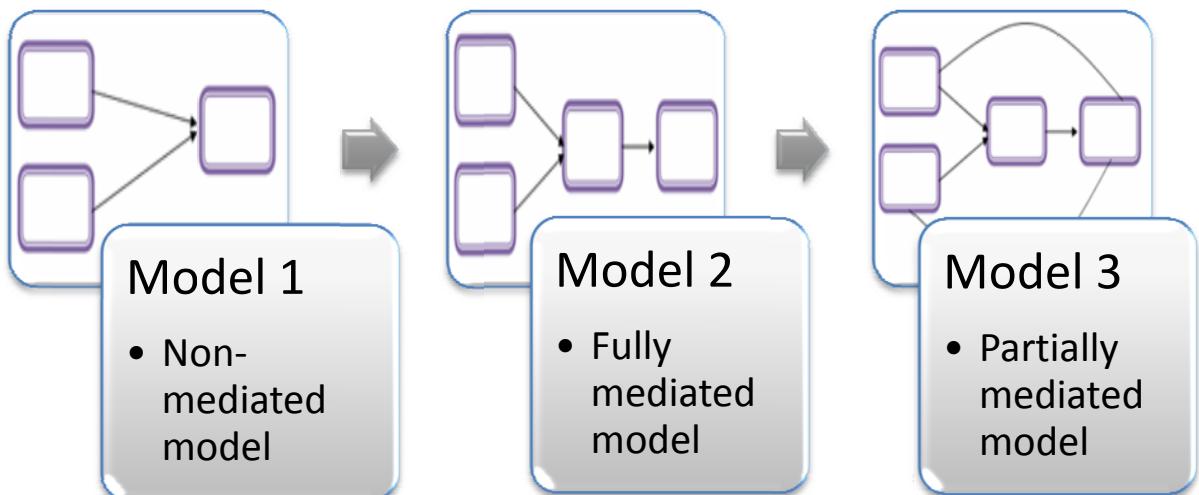

Figure 2: Three competing models.

As shown in Table 4-4, all the values of goodness of fit indicators suggest that the partially mediated model fit better than the other two rival models. Most importantly, most the indices in the partially mediated model fulfill the recommendations, except for the Chi-Square value and RMSEA. Although the root mean square residual is slightly higher than the recommended value, but it is still in the range of 0.05 to 0.10, which is considered an indication of fair fit (MacCallum, Browne et al. 1996). As we know, the Chi-Square statistic is sensitive to sample size such that it nearly always rejects the model when large samples are collected (Joreskog 1993). On the other hand, where small samples are used, the Chi-Square statistic lacks power and may not discriminate between good fitting models and poor fitting models (Kenny and McCoach 2003) Due to the restrictiveness of the Chi-Square, alternative indices are taken special consideration in the case of large sample size. In this research, the sample size is as large as 1269; therefore, the other goodness of fit indices, which well exceed the recommended level of 0.9, should conclude to suggest an adequate fit to the data for the partially mediated model.

Table 4-4 : Goodness of fit for the three competing models

Model goodness of fit	χ^2 (d.f)	χ^2diff(d.f)	GFI >0.9	AGFI >0.9	NFI >0.9	NNFI >0.9	CFI >0.9	RMSEA <0.08
Model 1	554.91(42)		0.93	0.88	0.91	0.89	0.91	0.99
Model 2	885.16(41)	330.25(1)[a]**	0.89	0.82	0.86	0.82	0.87	0.128
Model 3	286.06(37)	53.77(5)[b]**	0.96	0.93	0.95	0.94	0.96	0.073

Note: the numbers in () indicate degree of freedom

[a]The result of the difference between Model 1 and Model 2.
[b]The result of the difference between Model 1 and Model 3.

Given that the partially mediated model has a better goodness of fit than the others, this

model is specified in our analysis of structural equation modeling to assess the hypotheses.

The results are illustrated in Figure 3. As shown in Figure 3, there are two paths, direct and

indirect, between the two independent variables, trust and concern for privacy, and the

dependent variable, the intention to share personal information and revisit. As predicted by

Hypothesis 1a and Hypothesis 1b, trust directly and positively affects the intention to revisit

and intention to share personal information and the path coefficient are respectively .31

and .51 (H_{1a}: β = .31, p < .001, H_{1b}: β = .51, p < .001). On the other hand, intention to share

personal information and the effect is also highly significant (H_2: β = -.29, p < .001). The

direct effects proposed in Hypothesis 1a Hypothesis 1b and Hypothesis 2 are strongly

supported by the empirical data.
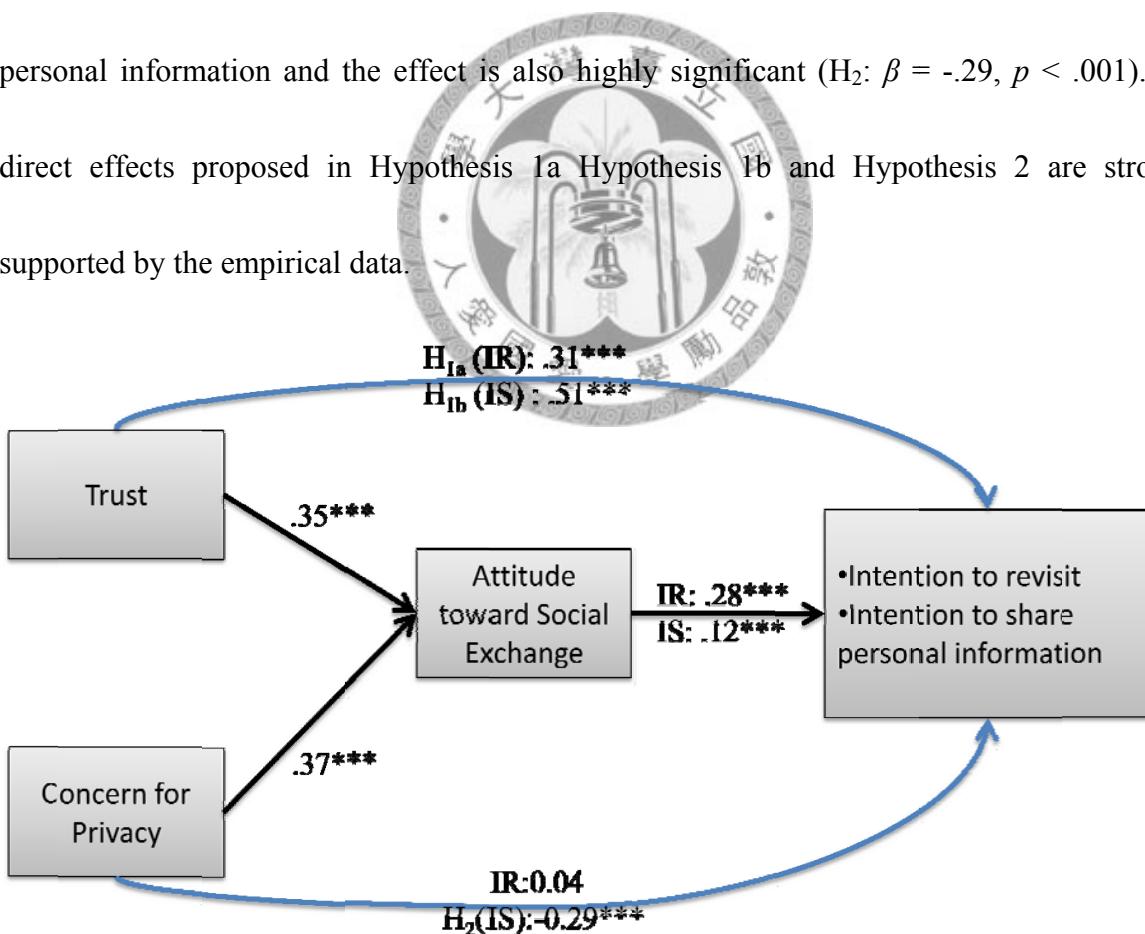
Note: IR: Intention to Revisit ; IS: Intention to share personal information

Figure 3：Structural equation model of the relationships between
Trust and Concern for Privacy

Besides the direct effects, the indirect effects proposed in Hypothesis 3a, Hypothesis 3b, Hypothesis 4a, and Hypothesis 4b are also strongly supported by the data. We calculated indirect effect path coefficients by multiplying the standardized path coefficients for trust's relationship with the mediator and the standardized path coefficients for the mediator's relationship with the outcome variable (Kenny, Kashy et al. 1998; Shrout and Bolger 2002; Preacher and Hayes 2008). We calculated a standard error for these coefficients using the formula provided by Kenny(Kenny, Kashy et al. 1998), which is a test statistic approximately distributed as Z distribution. As we can see, trust positively affects social exchange attitude ($\beta = .35$, $p < .001$), which further mediates the effect onto the intention to revisit ($\beta = .28$, $p < .001$) and the intention to share personal information ($\beta = .12$, $p < .001$). That is, trust has significant indirect impact on the intention to revisit via attitude toward social exchange ($\beta = .098$, $Z = 6.463$, $p < .001$) and the intention to share personal information via attitude toward social exchange ($\beta = .042$, $Z = 3.71$, $p < .001$). Similarly, concern for privacy also significantly affects social exchange attitude ($\beta = .37$, $p < .001$), which further mediates the effects onto the intention to revisit ($\beta = .28$, $p < .001$) and the intention to share personal information ($\beta = .12$, $p < .001$). As a result, concern for privacy had a significant indirect impact on the intention to revisit via attitude toward social exchange ($\beta = .104$, $Z = 5.65$, $p < .001$) and on the intention to share personal information via attitude toward social exchange ($\beta = .044$, $Z = 3.535$, $p < .001$).

Most interestingly, the indirect path between concern for privacy and the intention to share personal information is positive, even though the direct path is negative. All the direct, indirect and total effects between the constructs are listed on Table 4-5. This model explains 34% of the variance in the constructs of attitude toward social exchange, 55% of the variance in the construct of the intention to revisit and 41% of the variance in the construct of the intention to share personal information, as indicated by the values of R^2.

Table 4-5: Direct effect, Indirect effect and Total effect (N=1269)

All (Sample size=1269)

		Attitude Toward Social exchange		Intention to Revisit		Intention to Release Personal Info	
		β	t-value	β	t-value	β	t-value
Trust	Direct Effect	.35	10.61***	.31	10.21***	.51	18***
	Indirect Effect			.0980	6.463***	.0420	3.71***
	Total Effect	.35	10.61***	.408		.552	
Concern for privacy	Direct Effect	.37	7.84***	.04	1.32	-.29	-7.59***
	Indirect Effect			.1036	5.65***	.0444	3.535***
	Total Effect	.37	7.84***	.1436		-.2456	
Attitude Toward Social exchange	Direct Effect			.28	8.15***	.12	3.96***
	Indirect Effect						
	Total Effect			.28	8.15***	.12	3.96***
R^2		.34		.55		.41	

Testing of moderating effects

To examine the moderating effects, we employ two models compared test suggested by

Dabholkar and Bagozzi(2002) and run four groups for moderating variable, as Figure 4

indicated. Model A had all factor loadings constrained across four groups, and error variances of the endogenous variables were also constrained. Model B had all the factor loadings free but error variances of the endogenous variables were constrained. Model A controls the error variance in four groups, whereas Model B let four groups initiates their own path coefficients. With the view of controlling the error variance, if the difference of chi-square value ($\chi2$) between Model A and Model B divided by the change in degrees of freedom ($\Delta\chi2/ \Delta d.f$) was greater 3.84, there exists moderating effect(Dabholkar and Bagozzi 2002). The results of the test on the moderating effect of different types of virtual communities show in Table 4-6. The value of ($\Delta\chi2/ \Delta d.f$) is 5.2948 ($p = .02$), which is greater than 3.84 and the overall model fit indices: GFI, IFI, NFI, NNFI, CFI exceed the recommended level of 0.9, RMSEA is smaller and better than Model A. Hence, hypothesis 5 is supported. The type of virtual communities is a moderator to affect the model.
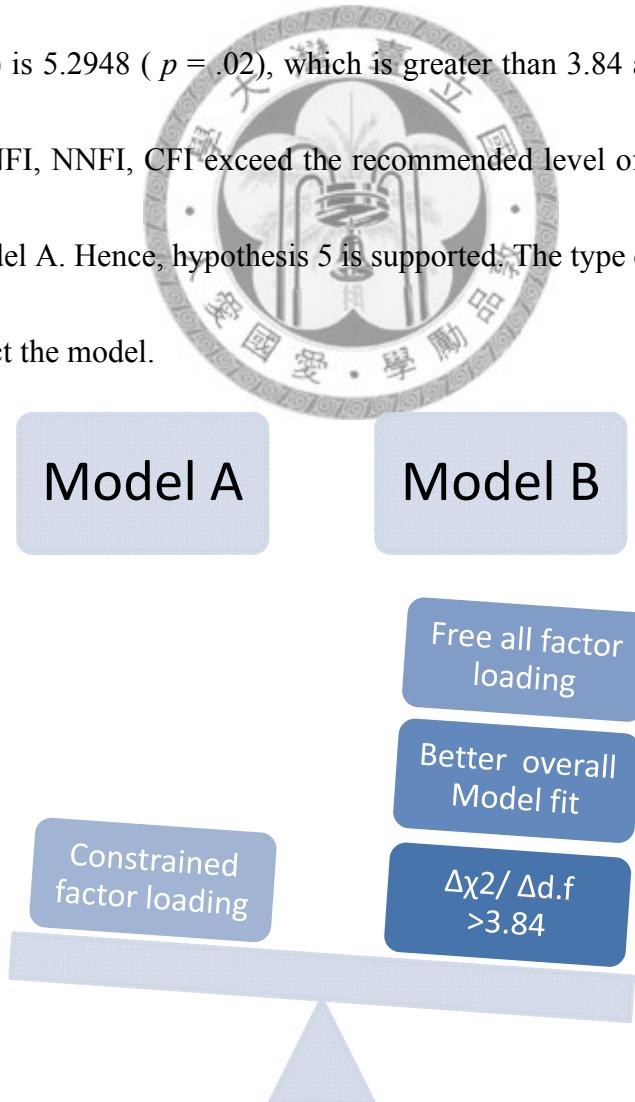

Figure 4: Comparison with Model A and Model B

Table 4-6: Structural Equations Results for Moderator Effect Models

Moderator Variable	Model	χ^2	d.f	GFI	IFI	NFI	NNFI	CFI	RMSEA	Δχ2/ Δd.f	p value
	A	580.81	173	0.86	0.94	0.92	0.92	0.94	0.086		
	B	448.44	148	0.91	0.96	0.94	0.93	0.96	0.080	5.29	.02
Criterion				>0.9	>0.9	>0.9	>0.9	>0.9	<0.08	>3.84	< .05

Table 4-7: Result for moderating effects

Relationship Within Core Model	Yahoo Shopping (Transaction)	WOW (Fantasy)	Facebook (Relation)	Mobile01 (Interest)
Trust→ASE	.47***	.26***	.41***	.64***
CoPri→ASE	.42***	.41***	.21**	.42*
Trust→Revisit	.69***	.31***	.6***	.56***
CoPri→Revisit	.09*	.17*	.04	.09
ASE→ Revisit	.11**	.14*	.10	.14
Trust→Release	.47***	.51***	.36***	.49***
CoPri→Release	- .29***	- .30***	- .31**	- .42*
ASE→Release	.17***	.16**	.25**	.10

Note：* p<0.05, ** p<0.01, *** p<0.001

Release = Intention to share personal information, ASE= Attitude toward Social exchange, CoPri= Concern for Privacy, Revisit= Intention to revisit.

The results of the moderating effects (Hypotheses 5) are shown in Table 4-7. We examined respectively the results of four communities. As we can see that in Yahoo shopping group, trust positively affects social exchange attitude (β = .47, p < .001), which further mediates the effect onto the intention to revisit (β = .11, p < .05) and intention to share personal information (β = .17, p < .001). That is, trust has significant indirect impact on the intention to revisit (β = .052, Z = 2.365, p < .01) and the intention to share personal information (β = .080, Z = 3.09, p < .001) via attitude toward social exchange. Concern for

privacy significantly affects social exchange attitude (β = .42, p < .001). Concern for privacy mediates the effects onto the intention to revisit (β = .11, p < .05) and onto the intention to share personal information (β = .17, p < .001). Concern for privacy had a significant indirect impact on the intention to revisit (β = .046, Z = 2.246, p < .05) and the intention to share personal information (β = .071, Z = 2.836, p < .01) via attitude toward social exchange.

Second, in the WOW group, we can see, trust positively affects social exchange attitude (β = .26, p < .001), which further mediates the effect onto the intention to revisit (β = .14, p < .05) and onto the intention to share personal information (β = .16, p < .01). Trust has significant indirect impact onto the intention to revisit (β = .036, Z = 1.97, p < .05) and on the intention to share personal information (β = .042, Z = 2.85, p < .01) via attitude toward social exchange. Concern for privacy significantly affects social exchange attitude (β = 0.41, p < .001), which mediates the effects on the intention to revisit (β = .14, p < .05)　and onto the intention to share personal information (β = .16, p < .01). As a result, concern for privacy had a significant indirect impact on the intention to revisit (β = .057, Z = 1.96, p < .05) and the intention to share personal information (β = .066, Z = 2.46, p < .05) via attitude toward social exchange.

Next, in the Facebook group, we can see, trust positively affects social exchange attitude (β = .41, p < .001) and concern for privacy significantly affects social exchange attitude (β = 0.21, p < .01). As result indicated social exchange doesn't mediates the effect onto the intention to revisit (β = .10, p > .05) but mediates onto the intention to share personal

information (β = .25, p < .01). Trust (β = .041, Z = 1.20, p > .05) and concern for privacy via attitude toward social exchange (β = .021, Z = 1.12 p > .05) doesn't have significant indirect impact onto the two dependent variables. Additionally, trust had a significant indirect impact on the intention to share personal information (β = .103, Z = 2.40, p < .05). Concern for privacy had a nearly significant indirect impact on the intention to share personal information (β = .053, Z = 1.89, p = .052).

Finally, we discovered that in the Mobile01 group, trust positively affects social exchange attitude (β = .64, p < .001) and concern for privacy significantly affects social exchange attitude (β = 0.42, p < .05). However, the impact of mediator on both dependent variables has no significant relationship, neither intention to revisit (β = 0.14, p = .09), nor intention to share personal information (β = 0.10, p = .25). Therefore, trust has no significant indirect impact on two dependent variables (Intention to revisit: β = .090, Z = 1.67, p = .095; Intention to release: β = .059, Z = 1.41, p = .16). Concern for privacy has no significantly indirect affects neither two outcome variables (Intention to revisit: β = .064, Z = 1.15, p = .15; Intention to release: β = .042, Z = 1.05, p = .31).

Among these four groups of virtual community, we summarize our results respectively according to the two dependent variables. First, with the view of the intention to revisit, we found that the mediating effect from trust exist in Yahoo shopping (Transaction) and WOW (Fantasy), and the mediating effect from concern for privacy slightly exist in Yahoo shopping(Transaction) and WOW(Fantasy). Second, most important of all, we examine that

the mediating effect from trust and concern for privacy through intention to share personal

information in four groups. Three (transaction, fantasy, and relation) of them have

significantly positive effect from trust and concern for privacy via social exchange. However,

Mobile0 (Interest) have no significantly indirect effect neither trust nor concern for privacy

via social exchange as Figure 5 shown. Different virtual communities meet four needs of

online users, and the mediating effect of attitude toward social exchange in Yahoo shopping

(Transaction)，WOW(Fantasy) and Facebook(Relation) groups exists strong indirect effect,

whereas the Mobile01groups don't have significantly indirect effect.
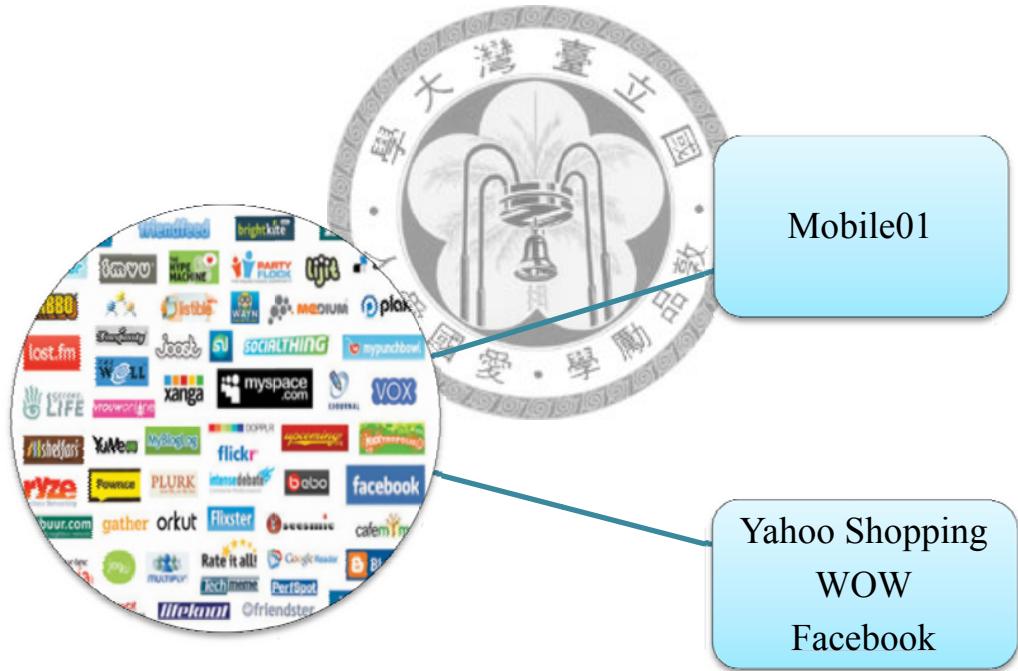
*Figure 5: The classification of virtual communities from the view of
intention to share personal information.*

5. Conclusions and discussions

According with preview results, we found that trust has a strong positive effect on intention to share personal information which is consistent with Liu's studies (Liu, Marchewka et al. 2005), and concern for privacy has a negative effect, as consistent with Awad's studies.(Awad 2006) In full view of the virtual communities, as predicted by the hypotheses proposed in this study, both trust and concern for privacy have indirect impacts on the intention to share personal information as well, via the attitudes toward social exchange. The empirical results suggest that attitudes towards social exchange plays an important role of mediator in the negative influence of concern for privacy and the positive influence of trust on sharing private information.

Interestingly, the indirect path between concern for privacy and intention to share personal information is positive, whereas the direct effect is negative. These results suggest that regarding privacy risks, users have two possible ways. First, they might simply reject any chance of possible mutual gains through interaction, as indicated in the direct path. Or they might choose to understand their partners through iterative interactions and building long-term relationships, as indicated in the indirect path via social exchange. To date, most studies on concern for privacy only suggest a negative path leading to information sharing. Hoffman and Novak (1999) once indicated that users are concerned about their private information when they make transactions online. However, because of information security concerns, users cannot make themselves anonymous to complete the transactions. Therefore

users make cost-benefit trade-off when deciding whether to engage in social exchange or not. They may seek to engage in building long-term relationship, and choose to ignore or decrease the perceived cost to release private information. Hoffman's studies only showed us the possible concept of social exchange effect(Hoffman, Novak et al. 1999), and they don't provide empirical evidences to support the concepts. Our research offers strong empirical evidences to reveals a possible positive path of social exchange. That is, users with a high level of concern for privacy can be willing to release their privacy information when they are with positive social exchange attitude about building long-term relationship with others online.

Information technology and Internet are growing in popularity. With the convenience and transparency that Internet features, the resurgence of privacy concern has caught a lot of attentions from individual users, companies, and IS managers. The empirical results of this study suggest that trust and social exchange are two powerful ways to alleviate concerns. The moderating effect of virtual community types, as result indicated that the type of community has significantly moderator effect upon the proposed model. There are two comparisons needed to explain. First, the indirect effect of trust is that Facebook > Yahoo shopping >WOW, and Mobile01 doesn't exist mediator effect. Second, the indirect impact of concern for privacy is that Yahoo shopping > WOW> Facebook and Mobile01 don't exist a mediator effect.

Examining the effect of four community groups respectively, the group of Yahoo

shopping (community of transaction) showed that in two possible ways, trust and concern for privacy motivated by social exchange to decrease perceived cost and seek to engage in long-term relationship. Even though the major objective of Yahoo shopping is to provide the users the online platform to complete the auction transactions, it still involves both economic and social exchange. Surprisingly, among four online groups, the two indirect effects of attitude toward social exchange of Yahoo shopping both demonstrated strong significantly relationship. Therefore, we realized that social exchange plays a critical role when users of transaction community decide to give out their private information or not.

As to the WOW group (community of fantasy), the result illustrated the mediator also play an important role in trust and concern for privacy toward information disclosure intention. The features of fantasy community are that users can create their new own characters, environments, personalities or stories online, and team up to work on the same goals, such as fighting with monsters, upgrading to higher level, or accomplishing the missions to acquire scares resources in virtual environment. In this way, constructing long-term relationship with others becomes a crucial issue in the fantasy community. The indirect effect of concern for privacy is positive, whereas the direct effect is negative, so attitude toward social exchange balances the negative and positive effect apparently in concern for privacy. Besides, the indirect effect of concern for privacy (β =.066) is greater than trust (β =.042). The mediator of social exchange plays great impact on the path from concern for privacy.

Next, the result of the Facebook group (community of relation), the indirect effect of

trust significantly exists, and among the four groups, it demonstrated the most powerful mediator effect upon trust. The featuring characters of Facebook are that the social network can keep in touch with old friends that might lose contact from each others for years and only friends, belonging to the same network with users, have the right to access your profiles. Moreover, the major purpose of relation community is that users want to acquaint with new friends or interact with old friends. With the leading purpose and security policy, the negative relationship from concern for privacy toward intention to share personal information in Facebook nearly significantly exists. Furthermore, trust has a strong positive indirect effect that social exchange enhances the relationship. While the social exchange plays significant role on intention to release private information, the mediator of social exchange doesn't have impact on the intention to revisit.
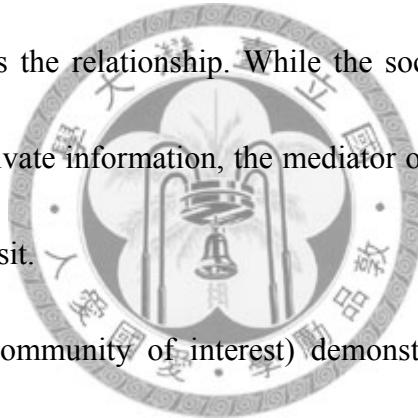
Finally, Mobile01 (community of interest) demonstrated that the mediator effect doesn't exist in any path of proposed model. Mobile01 provide the virtual platform to bring together users who are interested in some specific topics, such as Notebook, digital camera, cell phone, PDA & GPS, car, bike, and 3C products. The most activities they engage are that exploring the interesting topics instead of signing in to share personal thoughts. Most virtual interest communities offer an open attitude toward explorers, and when users access the articles or browse through the website, they don't have to sign in. Hence the positive relationship from attitude toward social exchange didn't significantly exist. The mediator effect of social exchange might insignificant exist in communities of interest.

In sum, Mobile01 doesn't have the mediator effect on both outcome variables, whereas other communities do. Perceived risk is one of possible factors to differentiate the mediated effect among four groups. Perceived risk refers to the nature and amount of risk perceived by a users in considering a particular decision (Cox and Rich 1964). As previous results indicated the community of interest doesn't have mediated effect because this kind of community doesn't have to sign in to acquire service or information they want. That is, users regard the perceived risk of engaging in the community of interest as a little or little costs, so that the mediated effect of social exchange plays an unimportant role in the interest community.

5.1. Contributions:

The contributions of this research are innovative and can be applied to future research on any social exchange experience. From the theoretical perspective, this study takes an innovative step in integrating the concept of social exchange with the process of personal information sharing. It sheds some light on the complex nature of the relationships between social exchange, trust and concern for privacy. This study is one of the first to address the relationship aspects of virtual communities from social exchange point of view. The previous studies suffer from many problems in exploratory studies: measures of social exchange, and procedures. Additionally, this research indicated four types of virtual communities demonstrated different features that social exchange might mediate or not. From the

managerial perspective, the issue of encouraging sharing personal information should be managed with cautions by building long-term relationships with users online. For the sake of preventing unexpectedly strong objections from users that might result in not to engage in long-term relationship, the regulations and privacy policy should be customized by its' demand in different types of community. Furthermore, in order to maintain social exchange, users' expectations, values, and norms should be also cautiously observed. If they feel betrayed due to privacy violation, as seen in the short-lived project of "beacon" in Facebook, they would reject to share private information anymore.

6. Limitations and future research：

There are three major limitations in this research. First of all, the sample is saturated with males (65.3%) and students (59.2%). The second factor is also highly correlated with age and education. Humans' value can change with time and might possibly have different degrees of trust, concern for privacy, social exchange attitude and intention to share personal information. Hence detailed analyses are required to exclude possible confounded impacts of those demographic characteristics on the constructs of this research. Secondly, there are only four types of virtual communities included in this research, and only one virtual community was studied for each type. However, given that each of the virtual community is highly representative of their respective type, this issue should be of less concern. Thirdly, this research applies a cross-sectional survey method, which does reveal the process, on-going nature of social exchange. Nonetheless, it can still catch the disclosure of attitudes toward social exchange of the community users.

Three possible lines of research could be further developed based on this study regarding the issue of online privacy. First, the possible effects of cultures can be exploited. As Chen (2008) indicated culture has lasting impacts on privacy(Chen, Chen et al. 2008). People in different cultures have different standards of privacy rights. For example, people from US, famous for a highly individualistic culture, have a higher standard of privacy right, and could be less likely to reveal their personal information online. While social exchange theory also assumes that the attitude toward social exchange is embedded in cultures, the role of culture

could be prominent in the proposed model of this study. Therefore, it is interesting to examine the impacts of differences cultures with regard to sharing private information and social exchange online. The second possible issue of research is to focus on the possible role of two forms of exchange, not only social exchange but also economic exchange and the possible interactions between social exchange and economic exchange online. As mentioned in the previous text, social exchange is quite different from economic exchange. Blau believed "only social exchange tends to engender feelings of personal obligations, gratitude, and trust; purely economic exchange as such does not" (p.94). However, these two constructs could be highly intricate with each other. According to Hoffman's research, users try to seek to engage in relationship exchange even in economic exchange. Moreover consumers make cost-benefit trade-offs when considering whether to engage in a relationship exchange or not (Hoffman, Novak et al. 1999). The impacts of social and economic exchange in different types of virtual communities could be hence different. Therefore, it would be interesting to investigate the impacts of both kinds of exchange at the same time.

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Appendix 1: Original Measurement

(VC means virtual communities: Yahoo shopping, Mobile01, WOW or Facebook)

Concern for Privacy: Information Privacy Measuring Individuals' Concerns About organizational Practices--(Smith and Milberg 1996)

Collection subscale

- pco1: It usually bothers me when companies ask me for personal information
- pco2: When companies ask me for personal information, I sometimes think twice before providing information.
- pco3: It bothers me to give personal information to so many companies.
- pco4: I'm concerned that companies are collecting too much personal information about me.

Errors subscale

- per4: All the personal information in computer databases should be double-checked for accuracy - no matter how much this costs.
- per5: Companies should take more steps to make sure that the personal information in their files is accurate.
- per6: Companies should have better procedures to correct errors in personal information…[R]
- per37: Companies should devote more time and effort to verifying the accuracy of the personal information in their databases.
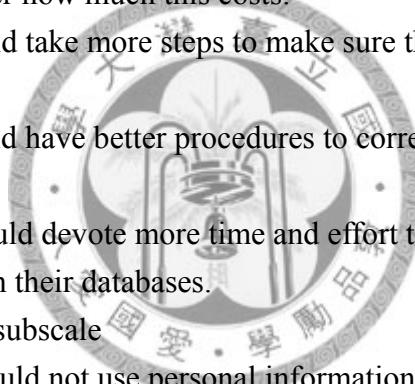
Unauthorized Secondary Use subscale

- pun38: Companies should not use personal information for any purpose unless it has been authorized by the individuals who provided the information.
- pun39: When people give personal information to a company for some reasons, the company should never use the information for any other reason.
- pun40: Companies should never sell the personal information in their computer databases to other companies.
- pun41: Companies should never share personal information with other companies unless it has been authorized by the individuals who provided the information.

Improper access subscale

- pim42: Companies should devote more time and effort to preventing unauthorized access to personal information.
- pim43: Computer databases that contain personal information should be protected from unauthorized access-no matter how much it costs.
- pim44: Companies should take more steps to make sure that unauthorized people cannot access personal information in their computers.

Trust : Reflections on the Dimensions of Trust and Trustworthiness among Online Consumers   (Gefen 2002)

Integrity subscale

- tin8: Promises made by [VC] are likely to be reliable.
- tin9: I do not doubt the honesty of [VC].
- tin10: I expect that the advice given by [VC] is their best judgment.
- tin11: I can count on [VC] to be sincere.
- tin12: This [VC] wants to be known as one who keeps promises and commitments.
- tin13: Based on my experience with [VC], I know it is predictable.
- tin14: Based on my experience with [VC], I know it is not opportunistic.

Benevolence subscale

- tbe15: I expect that [VC] is ready and willing to assist and support me.
- tbe16: I expect that [VC] have good intentions toward me.
- tbe17: I expect that [VC] intentions are benevolent
- tbe18: I expect that [VC] puts customers' interests before its own.
- tbe19: I trust [VC] keeps my best interests in mind.
- tbe20: I find it necessary to be cautious with [VC].
- tbe21: Based on my experience with [VC], I know it cares about customers

Ability subscale

- tab22: [VC] are competent in data security. …[R]
- tab23: [VC] knows how to provide excellent data security service
- tab24: [VC] have professional skill to handle information release.
- tab25: [VC] know how to manage its employee to avoid sell personal information.
- tab26: [VC] know how to protect the data of this website.
- tab27: [VC] know how to deal with problems when hacker invades the website.
- tab28: [VC] have the ability to lessen the broadband, when the website overloads.
- tab29: [VC] have the professional to set up the safety access mechanism.
- tab30: [VC] can provide assistants when my identity account probably is stolen.

Attitude toward social exchange: Structures of Social Life: The Four Elementary Forms of Human Relations: Communal Sharing, Authority Ranking, Equality Matching, Market Pricing.---(Fiske 1993)

Communal Sharing subscale

- sco45: if either of us needs something, the other members of [VC] give it without expecting anything in return.
- sco46: Many important things (such as resource, bandwidth, platform) I use belong to the members of [VC] and me together, not to either one of you separately.
- sco47: We and share many important responsibilities (such as social norms and rules) jointly, without assigning them to either of us alone.
- sco48: I feel a moral obligation to feel kind and compassionate to each other of [VC].

- sco49: The members of [VC] and I tend to develop very similar attitudes and values.
- sco50: I feel that we have something unique in common that makes members of [VC] and me essentially the same.

Equality Matching subscale

- seq51: On [VC], we keep track of what we give to each other, in order to try to give back the same kind of things in return eventually; we each know when things are uneven.
- seq52: On [VC], the members of [VC] and I typically divide things up into shares that are the same size, such as access to information, release my thoughts and revise the content.
- seq53: On [VC], if one member does what the other wants, next time the second person should do what the first.
- seq54: On [VC], the members of [VC] and I have a right to equal treatment, such as resources online.
- seq55: On [VC], the members of [VC] and I have to respect others when making decision.

Intention to share personal information: Beyond concern—a privacy-trust- behavioral intention model of electronic commerce.(Liu, Marchewka et al. 2005)

Repeat visit

- bin31: I would be willing to visit the [VC] again.

Positive remarks or comments about the web site

- bin33: I have positive things to say about the [VC].

Release personal information

- bin34: After visiting the [VC], I would be willing to provide my personal information this site.
- bin35: I would be willing to release my personal information to the [VC] if I am requested.

Personal information be used

- bin36: I would be willing to let the [VC] use my personal information.

Appendix 2: Translation Measurement into Chinese version

(Facebook 可替換成 Mobile01、奇摩拍賣、WOW 魔獸世界)

Concern for Privacy-Collection subscale:

1. 當 Facebook 索取我個人資料時，我會感到很困擾。
2. 當 Facebook 索取我個人資料時，我會反覆思考此要求。
3. 當我的個人資料提供給許多網站時，我會感到很困擾。
4. 當 Facebook 蒐集許多關於我的資料，我會很在意。

Concern for Privacy-Error subscale:

5. 我個人認為，不管花多少成本，資料庫中的所有個人資料都應該經過再次核對，以確保正確性。
6. 我個人認為，Facebook **不用**採取多重措施，確保個人資料是正確的。
7. 我個人認為，Facebook 應該有良好的流程，去修正錯誤的個人資料。
37. 我個人認為，Facebook 應該投入許多的時間及努力，檢驗資料庫中個人資料的正確性。

Trust- Integrity subscale:

8. Facebook 對於隱私權的承諾，我認為是可信賴。
9. 我不會去質疑 Facebook 的誠信。
10. 我認為 Facebook 總是提供他們最好的建議。
11. 我相信 Facebook 是很誠懇正直。
12. 我認為 Facebook 想要被大家，定位為守信用、重承諾。
13. 根據我先前使用 Facebook 經驗，我知道它是可預期的。
14. 根據我先前使用 Facebook 經驗，我知道它不會投機取巧。

Trust- Benevolence subscale:

15. 我相信 Facebook 願意幫助我。
16. 我相信 Facebook 對我抱持善意的意向。
17. 我相信 Facebook 的意向是善良的。
18. 我相信 Facebook 把使用者的利益放在他們利益之前。
19. 我相信 Facebook 會為我著想。
20. 我認為使用 Facebook 必須要謹慎。
21. 根據我先前使用 Facebook 經驗，我知道它很重視使用者。

Trust- Benevolence subscale:

22. 我認為 Facebook 在資訊安全方面，具有專業能力。

23. 我認為 Facebook **不知道**要如何提供優質的資訊安全保護措施。
24. 我認為 Facebook 有專業能力處理個人資料外洩的情況。
25. 我認為 Facebook 有能力管理內部員工，避免員工向外面販售個人資料。
26. 我認為 Facebook 知道要如何保護網站內的個人資料。
27. 當駭客侵入網站，我認為 Facebook 有專業能力能夠即時處理。
28. 我認為當網站流量過大，超出負荷時，Facebook 有能力紓解流量問題。
29. 我認為 Facebook 有專業能力，建立安全的存取控制機制。
30. 我認為當我的個人資料被盜用時，Facebook 有專業能力提供即時的協助。

Intention to revisit:
31. 我願意再瀏覽 Facebook 網站。
33. 我對於 Facebook 有正面的評價。

Intention to share personal information:
34. 再瀏覽過 Facebook 後，我願意提供我的個人資料給該網站。
35. 我願意讓 Facebook 使用我的個人資料，在網站內部使用上。
36. 我願意讓 Facebook 將我的個人資料與第三方分享。

Concern for privacy- Unauthorized Secondary subscale:
38. 我個人認為，除非已經得到當事人的同意，Facebook 不該為了任何目的使用個人資料。
39. 我個人認為，當我因為某些理由將個人資料給 Facebook，Facebook 不該將個人資料使用在其他目的上。
40. 我個人認為，Facebook 不能將資料庫內的個人資料，販售給其他公司。
41. 我個人認為除了已經得到當事人的同意，Facebook 不能分享個人資料給其他公司。

Concern for privacy- Improper access subscale:
42. 我個人認為，Facebook 應該投入許多時間及努力，避免任何人未經授權使用個人資料。
43. 我個人認為，不管需要花多少成本，資料庫應該有授權存取的管理機制。
44. 我個人認為，Facebook 應該採取某些措施，以確保電腦內的個人資料，未經授權的使用者不可以使用該資料。

Attitude toward social exchange-Communal sharing subscale:
45. 如果我們需要幫助，我與 Facebook 的社群成員會願意給予對方幫助，不期望有回報。
46. Facebook 中有許多重要的資源(ex:資訊、頻寬、網路空間、互動平台)是屬 於我與 Facebook 的社群成員，而非只屬於一方。
47. 在 Facebook 中，我與 Facebook 的社群成員共同分擔責任(ex:網路秩序、使用規範)，而非單方獨立承擔維護。

48. 在 Facebook 中，我與 Facebook 的社群成員有道德義務，對於對方應該要和善跟有同理心。

49. 在 Facebook 中，我認為我與 Facebook 的社群成員會發展出相似的態度跟價值觀。

50. 在 Facebook 中，我覺得因為與 Facebook 的社群成員具有共同特點，讓我們感覺像是同一群體。

Attitude toward social exchange-Equality Matching subscale:

51. 在 Facebook 中，我與 Facebook 的社群成員對於彼此施與受的付出，我們都會記得，也預期將來彼此會有對等的回報。

52. 在 Facebook 中，我與 Facebook 的社群成員彼此有平等對待的權利(ex:更改、取得資訊、發表意見)。

53. 在 Facebook 中，我與 Facebook 的社群成員互動中，如果有人先做了對方想做的事情，下次應該禮讓他人。

54. 在 Facebook 中，我與 Facebook 的社群成員機會均等(ex:使用資源)。

55. 在 Facebook 中，尊重每個人的意見是制定決策時的原則。

Appendix 3:Subject consent（受試者同意書）

實驗名稱：網路社群個人隱私與知識分享

受試者同意書：

◆　限制：徵求具有下列網站帳號的使用者 填寫問卷

(1)Yahoo 拍賣　(2)WOW 魔獸世界 (3)Facebook (4)Mobile01

謝謝您同意參與這次研究。我的名字是 ＿＿＿＿＿＿＿＿＿＿＿。
我最常使用下列何種社群網站：(請選擇一個)

　　　　□　Yahoo 拍賣
　　　　□　WOW 魔獸世界
　　　　□　Facebok
　　　　□　Mobile01

　　　這份研究旨在檢驗 社群使用者對於網路上個人隱私權的想法，並嘗試找出關係。這份研究是從社群使用者蒐集問卷，將資料進行分析比較，所有的資料都會以匿名的方式處理，此問卷填達的各項資料純作為學術研究用，研究結果將以群體資料的型式呈現，個人資料絕不對外公開，請放心填答。你所參與的問卷是屬於自願性質，你可以拒絕回答或是退出，感謝您的參與。

　　　　　　　　　　　　　　　　　　　國立台灣大學資訊管理所
　　　　　　　　　　　　　　　　　　指導教授：陳鴻基 博士
　　　　　　　　　　　　　　　　　　　　　吳玲玲 博士
　　　　　　　　　　　　　　　　　研究生：曾素瑜

請您在下方的同意表格上簽名：

同意表：

我已經了解此份研究的細節。
我明白所有蒐集的資訊將會保密。我了解我可以在任何階段退出此項研究。

受試者簽名：	
受試日期：	
受試者編號：	(實驗人員給予)