Association for Information Systems
AIS Electronic Library (AISeL)

AMCIS 2008 Proceedings

Americas Conference on Information Systems (AMCIS)

2008

Factors Motivating Software Piracy in Vietnam

Chul Woo Yoo
Seoul National University, userid7@snu.ac.kr

Misuk Kim
Seoul National University, mskim522@snu.ac.kr

Young Chan Choe
Seoul National University, aggi@snu.ac.kr

Vo Quoc Tuan
Can Tho University, vqtuangis@gmail.com

Factors motivating software piracy in Vietnam

Chul Woo Yoo
Seoul National University
userid7@snu.ac.kr
Misuk Kim
Seoul National University
mskim522@snu.ac.kr
Young Chan Choe
Seoul National University
aggi@snu.ac.kr
Vo Quoc Tuan
Can Tho University
vqtuan@gmail.com

ABSTRACT

This research focuses on the development and empirical validation of a model of software piracy behavior in Vietnam on the basis of institution isomorphism theory, deterrence theory, and expected utility theory. A survey of 145 respondents and PLS (Partial Least Square) were utilized for analysis. The test of this study reveals that mimetic pressure is the greatest significant factor to influence software piracy intention. Coercive pressure, normative pressure, punishment severity, and software cost are also significantly related to the intention. However, punishment certainty does not have a significant influence on software piracy.

Keywords

Software piracy, institution isomorphism theory, deterrence theory, expected utility theory

INTRODUCTION

Software piracy refers to the use of uncertified computer software and the unauthorized distribution of copied software. According to a report released by the BSA (Business Software Association) in 2006, lost revenues due to software piracy in 2006 amounted to $5 billion, a 15% increase from 2005. Moreover, the median piracy rate was 62%, meaning half of the countries studied had a piracy rate of 62% or higher. In just under one-third of the countries, the piracy rate was higher than 75% (BSA, 2006). To combat the serious losses caused by software piracy, two general methods are widely employed; preventatives and deterrents. The role of preventatives is to render software piracy difficult. Thus, to use piracy preventing software, making it more difficult and time consuming, would encourage users to abandon piracy. On the other hand, deterrents threaten the act of piracy by means of, for example, forcing legal actions (Gopal and Sanders, 1997). In spite of various studies and preventatives carried out against piracy acts, damages caused by piracy are ever increasing, according to reports from the BSA (Business Software Alliance) and SPA (Software Publisher Association). Countries suffering from the highest rates of piracy are, in the following order, Armenia (95%), Azerbaijan (94%), Zimbabwe (91%), and Vietnam (88%). Countries with the highest loss estimates from piracy are, the United States ($7,289m), China ($5,429m), and France ($2,676m) (BSA, 2006).

Until now, studies on piracy were conducted from a macroeconomic perspective, or were approached from a perspective that demonstrated the differences between male and female or the young and the old etc (Al-Rafee and Cronan, 2006; Gopal et al, 2004). Previous studies proved how variables such as GNP, regional environments, gender, educational level, and age are related to piracy (Gopal and Sanders, 1997; Gopal and Sanders 1998; Sundararajan, 2004). Recently, studies, not only such economical analyses but also on decision-making processes that lead to software piracy behavior, were conducted (Moores and Dhillon, 2000; Peace, Galletta and Thong, 2003). These studies verified preceding factors, especially the moral and psychological ones, which critically influence piracy behavior. These studies, which focused attention on piracy in the developed countries, identified the moral and psychological factors that affect piracy behaviors (Moore and Dhillon, 2000; Peace et al., 2003). However, there is a need to focus attention on piracy in the countries with the highest rates of piracy, in particular in Asian and South American countries. In some of these countries, the piracy rates decreased in recent years (for example, among the South American countries it decreased from 68% to 66%) while in others it increased (for example, in Asian countries it increased from 55% to 55%) (BSA, 2006). Among these Asian countries, Vietnam had the highest piracy rate, 88%. Therefore, an empirical study of decision-making processes regarding to regions with different economic or social environment is required to understand the mechanism of software piracy. This study was conducted on the basis of previous studies which examined developed countries, and we applied them to Vietnam. In order to prevent the use of pirated software, we reflected Institutional influence, influence of laws and penalties, and economic influence as well as personal

decision making aspect. This study is composed of the following order. First, we review expected utility theory, deterrence theory theory, and institution isomorphism theory. Second, we establish hypotheses, and propose a structural equation model based on literature review. Third, we empirically verify our research model, and confirm significance of hypotheses. Last, we discuss our research results and suggest theoretical and practical implications.

BACKGROUND AND HYPOTHESIS

Software Piracy

Software piracy is surfacing as one of the most serious problems that software industry confronts (Givon, Mahajan and Muller, 1995). Software has characteristics of a public property in that consumption benefit does not diminish by sharing with other people and also in that other's consumption does not influence one's self consumption possibility. People who do not directly pay for acquisition of public property can still consume it and receive accompanying benefits. In other words, it means free riding is possible when it comes to consuming information (Gopal and Sander, 1997). Piracy means the illegal copying of computer software and downloading copied contents on a disk illegally for the purpose of distribution to others. Piracy is against the law, and although it may be done, not for commercial use, but for private use, without legal consent or approval from the rightful person, it is considered as an illegal behavior. Even though there is a moral difference between piracy for commercial purposes in order to make a sale and piracy for individual purposes, legally there exists no difference between the two and both cases are considered illegal. With the recent development of information technology, violation of software intellectual property use occurs in a variety of fashions. According to the Koen and Im's (1997) study, software piracy can be classified into soft lifting, commercial piracy, and corporate piracy. Among these, soft lifting is the most common occurring form of software piracy. It refers to an individual piracy behavior by a person working in an organization or in a company for utilization at the office or at home. After purchasing licensed software, piracy includes an act of violation against licensing stipulations, sharing the software with friends and coworkers and installing it on computers or laptops, actions which are not allowed according the stipulation. Commercial piracy means illegally copying software and selling it to other people. Lastly, corporate piracy is purchasing software and storing it in corporate storage device allowing access to other people for usage. By doing so, corporate piracy can have the same effect as purchasing numerous pieces of software while only paying for one or a very few. This study does not deal with commercial piracy where piracy and selling takes place, nor corporate piracy where piracy and usage takes place, but with soft lifting where pirated software is used at home or at work on personal computers, which is the most common type of piracy.

Expected Utility Theory

An individual is rational and determines according to one's purpose and decides to behave in a way to maximize his or her expected utility under high uncertainty environment. This is defined as the expected utility theory (Gopal and Sanders, 1998; Gopal and Sanders, 2000). When faced with a decision-making situation, an individual takes into consideration the expected cost, benefit, the possibility of other alternatives and the potential consequences of that alternative. Here, costs and benefits are not necessarily related to economics. Factors that individuals cannot compare, for instance software cost and punishment possibility, are converted into utility, which compares measurable units and among these the solution with the highest expected utility is selected. The expected utility theory has been the groundwork for many analytic studies, and has been employed since the initial study of software piracy (Cheng, Sims and Teegen, 1997; Conner and Rumelt, 1991; Gopal and Sanders, 2000; Gopal and Sanders, 1998). Implicitly or explicitly the factors that explain the utility theory were found to have an influence on decision-making in software piracy behavior. According to a study by Peace (1997), in cases where software is needed, the computer users buy the software, continue the task without the software, or illegally copy the software. These three choices can be explained in the expected utility theory perspective. From the perspective of the expected utility theory, one must first understand what the cost and benefits are concerning the piracy behavior. First, in the case of cost, it not only refers to the purchase of the software, but also the level of punishment and the possibility of punishment, when caught, are included. Therefore, the expected utility of piracy refers to the expected gains outside of the punishment possibility and level of punishment taken into account. In other words, if an individual considers to pirate software has bigger expected utility compared to observe copyright, an individual will perform the software piracy. Peace et al. (2003) proposed that software cost is a representative variable that reflects expected utility theory well and employed software cost as a factor which influence attitude. They verified that software cost has significant influence on the attitude toward software piracy.

Deterrence Theory

Deterrence theory refers to declination of the level of illegal behavior when punishment certainty and punishment severity is increased. In other words, unwanted behavior can be suppressed by threat of punishment. By explaining that when people decide to take a risk they take into consideration punishment certainty and punishment severity more than anything, Schaub

(2004) formed the outline of the deterrence theory. Moreover, when a person decides to take a risk and when deciding whether to commit a crime or not, punishment certainty was shown to be a larger factor that punishment severity (Schaub, 2004). Deterrence theory is based upon utilitarianism, which considers the human as a being that 'maximizes gains' in the same context as exchange theory and utility theory. People have the tendency to calculate the gains and costs brought about by a certain behavior and maximize that benefit (Gopal and Sanders, 1997). Deterrence theory focuses on potential costs such as physical, property damage threat when caught in an illegal behavior and tries to minimize the cost while maximizing the benefits. Ehrlich (1996) linked deterrence theory directly to economical factors and proved that many crimes related to property are related to expected cost compared to expected gains. Several heavy crimes rates are substantially positively related to estimated gains, while with expected costs it has a negative relationship. Straub and Collins (1990) claimed that deterrence measures work as a primary strategy to reduce computer misuses. This study's results giving clues in solving software piracy problems. Recent surveys show in a case with a low probability of getting caught in piracy, the intention to pirate software is very high (Cheng et al., 1997). Based on previous studies, punishment certainty and punishment severity are used as important indicators when predicting software piracy and are employed as antecedents of attitude toward software piracy (Peace et al., 2003).

Attitude

Attitude has been long acknowledged as the most important construct in social psychology (Allport, 1935). This is evident by the overwhelming amount of research published (Ajzen, 2001; Peace et al., 2003; Al-Rafee and Cronan, 2006). Attitude has also been found to be the most significant factor influencing behavioral intention. A recent software piracy study (Peace et al., 2003) found that attitude had the strongest effect on intention to pirate software. Moreover, they found that 24% of variance in attitude toward software piracy was explained by punishment and software cost. Peace et al. (2003) explain that attitude mediates effects of punishment certainty, punishment severity and software cost on piracy intention. Accordingly, this study also suggested the hypotheses that punishment certainty, punishment severity and software cost are influential on attitude, and attitude is influential on piracy intention. Based on literature review, following hypotheses are proposed

H1 – Software cost has a positive (+) influence on the attitude towards software piracy.

H2 – Punishment certainty has a negative (-) influence on the attitude towards software piracy.

H3 – Punishment severity has a negative (-) influence on the attitude towards software piracy.

H4 – Attitude has a positive (+) influence on piracy intention.

Institution Isomorphism Theory

An institution can be defined as a norm of social order or form within an institutionalized environment, and institutional isomorphism is acceptance of this sort of social order or form by an organization (Jepperson, 1991). According to the institution isomorphism theory, organization is influenced by the normative institution formed within an institutionalized environment, an organization that accepts normative institution gains and institutional validity sustains higher performance by acquiring necessary resources compare to other organizations (DiMaggio and Powell, 1983). Normative social order exists in many forms such as laws and regulations, education, socially accepted ideas, generalized management forms, contracts, etc. Although all organizations have distinctions, they are influenced by the institutional environment. Under the institutional environment, normative social order or form, in other words, the institutional norm is formed and influenced by institutional environment (Tolber, 1983). DiMaggio and Powell (1983) categorized this influence as mimetic pressure, coercive pressure, and normative pressure.

Mimetic Pressure

According to the study by Hu, Hart and Cooke (2007), when faced with in an environment of high uncertainty, mimetic pressure induces an organization to imitate other organization's decisions. When faced with an ambiguous problem with no knowledge as to its cause, imitation behavior can bring about economical benefit by reducing cost, which otherwise would have been put into searching for a solution. Also, according to DiMaggio and Powell (1983), organization is influential within a similar territory with oneself and it has the tendency to take a resemblance to a successful organization. The reason is because these organizations have a similar economical network status, goal, product, clients, experience, etc (Burt, 1987). Many previous studies show that mimetic pressure is applied in various situations such as introduction of a web site (Flanagin, 2000), introduction of EDI (Teo, Wei and Benbasat, 2003), and selection of IT product (Tingling and Parent 2002). Moreover, Khalifa and Davison (2006) explain the introduction of new IT technology through mimetic pressure after witnessing companies earning profits through ETS (Electronic Trading System). Accordingly, this study defines mimetic

pressure as promotion of pirated software after witnessing the benefits that other people or peers gained through software piracy. According to the Givon et al. (1995), although using pirated software is immoral, through the psychological ease from using pirated software and social effect of pirated software users, people use pirated software because it means they are accepted by other people through that act. Therefore, through previous studies we established the following hypothesis.

H5 - Mimetic pressure has a positive (+) influence on the intention to use pirated software.

Coercive Pressure

DiMaggio and Powell (1983) explained that coercive pressure arises from official or unofficial pressure within an organizational environment that originated from other organization, social, cultural, and political factors. In other words, coercive pressure is the official and unofficial result of expectations from organizations that the organization is dependent upon and cultural expectations from the society that the organization is part of. Examples of official pressure are coercive regulations from the government or legal restraints. Cultural expectations fall into the unofficial pressure category. This sort of coercive pressure is formed to enhance the control capability of the organization within or among organizational territories and to ensure institutional validity of organizations. Khalifa and Davison (2006) explain how coercive pressure was applied on the intention to introduce ETS into the organization by introducing the institution isomorphism theory. Coercive pressure refers to the peculiar and regular pressure delivered by customers and suppliers who are deeply related to e-retailers in ETS introduction environment. Especially, it is essential to meet existing customers' requirements for customer retention in the e-commerce where the switching cost is very low. The coercive pressure that can be witnessed among organizations also exists among individuals. That is, when an individual decides to do or not to do something, regular pressure that is derived from the interested groups of people surrounding the individual, for instance - friends, coworkers, authoritarian figures - can place important pressure on the individual's decision-making process. In other words, instructions from the boss within an organization or a situation where one has to carry out a duty in order to accomplish a task effectively, the coercive pressure that one feels can also be applied when performing the "software piracy" behavior. The nature of software piracy is an immoral act, which is not an official pressure but is derived from social and cultural factors within an organization; therefore it is categorized as unofficial pressure. According to the above argument, this study proposed the following hypothesis.

H6 - Coercive pressure has a positive (+) influence on the intention to use pirated software.

Normative Pressure

Generally, normative pressure refers to sharing of the norm through related passages, and is defined as pressure that has potential influence on organizational behavior. (Powell and DiMaggio, 1991) According to the social association theory, an organization related to a successful organization through introduction of an innovative method is very likely to be persuaded to behave like a successful organization (Burt, 1987). Teo et al, (2003) explained technology acceptance by mimetic pressure, coercive pressure, normative pressure, size of the company, size of the IT department, complexity of the IT technology about to be introduced, when introducing new IT technology. The result of this study demonstrates that coercive pressure has path coefficient of 0.428, normative pressure has a strong influence on new technology introduction. Erickson (1988) described that direct and frequent communication induces related organizations to think and act more similar. Huff and Munro (1985) explained that if information is shared and stored among organizations, it will accelerate the introduction of new IT technology. According to Bouchard (1993), the decision of an organization to accept a new technology does not depend on the characteristics of an information technology, but rather on the number of companies that use the technology. Through this study, we can understand that when introducing a new technology, acceptance of a technology of another organization can have a significant influence on the introduction of a technology to the organization that has not yet accepted a new technology. Previous studies show that normative pressure has influence on the decision-making of an individual. Accordingly, in the case of the usage of pirated software, we can understand that an individual who did not consider using pirated software goes under normative pressure because his or her peers use much pirated software. Different from mimetic pressure originating from others gaining profit by using pirated software, or using pirated software due to other's coercive pressure, normative pressure renders people to use pirated software because many other people are using them. Based on this argument this study has posited the following hypothesis.

H7 - Normative pressure has a positive (+) influence on the intention to use pirated software.

RESEARCH MODEL

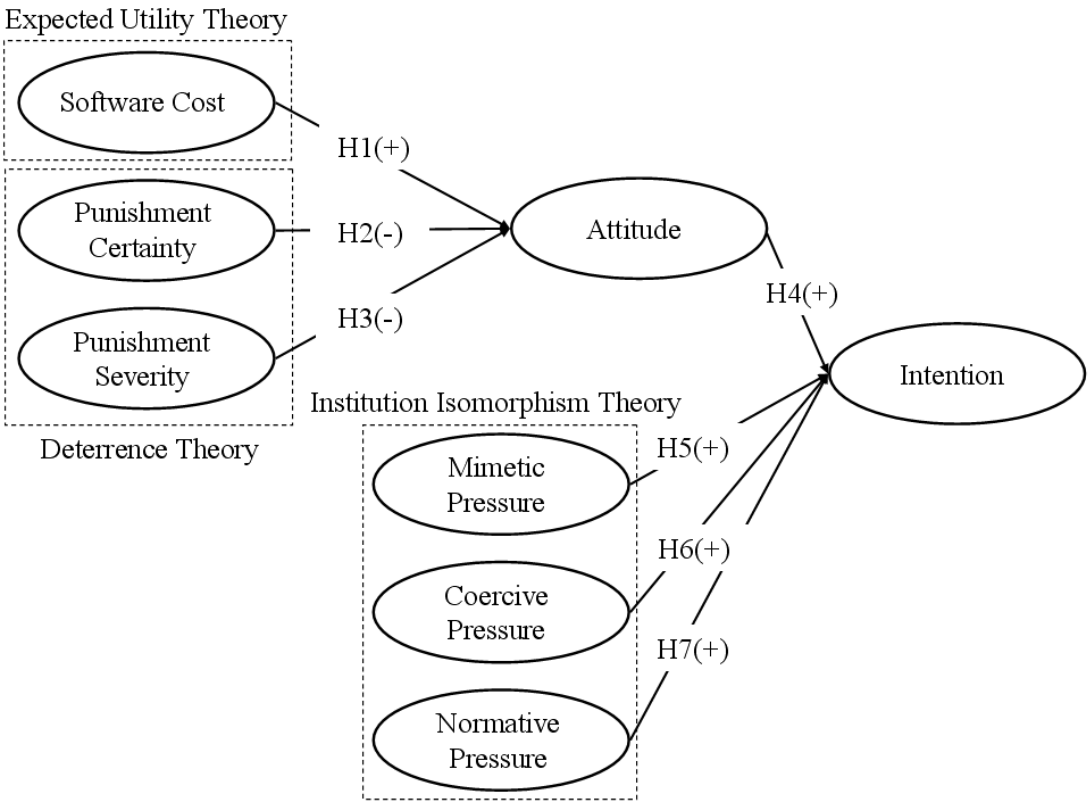

Figure 1. Research Model

This study proposed a research model Figure 1 based on the institution isomorphism theory, deterrence theory, and expected utility theory. This model includes the five (7) hypotheses stated above. Through the institution isomorphism theory, mimetic pressure, coercive pressure, and normative pressure were introduced, and through the deterrence theory, punishment severity and punishment certainty were introduced while software cost was introduced as a variable based on the expected utility theory.

In this study, we decided to collect data through a survey in order to verify the study model hypothesis proposed in Figure 1. In order to draw up adequate survey questions, we carried out a literature review, and made the survey questions listed in Table 1. Each question is measured based on a seven (7) point scale.

variable		question, (*)reverse coding	research
Punishment Severity	PS1	The punishment would be light when arrested for software piracy (*)	Peace et al.(2003)
	PS2	If I get caught for software piracy I would receive severe punishment	
	PS3	If I get arrested for piracy punishment would not be severe (*)	
Punishment Certainty	PC1	The possibility of myself getting arrested for software piracy is high	Peace et al.(2003)
	PC2	If I use pirated software I would likely get caught	
Software Cost	SC1	I feel software cost is very low these days (*)	Peace et al. (2003)
	SC2	In my opinion, the software package is very expensive	
	SC3	If I was to buy software these days, I would need a lot of money	
Mimetic	MP1	My coworkers gain profit by using pirated software	Teo et al.(2003)

Pressure	MP2	I don't feel coworkers who use pirated software are doing any harm	
	MP3	By using pirated software, my coworkers have nothing to lose	
Coercive Pressure	CP1	My work depends on my coworkers a great deal	Teo et al.(2003)
	CP2	My work is difficult without my coworkers' help	
	CP3	My work requires a good relationship with my coworkers	
Normative Pressure	NP1	My coworkers often use pirated software	Teo et al.(2003)
	NP2	My coworkers do not criticize usage of pirated software	
	NP3	Using pirated software is natural among my coworkers	
Attitude	AT1	To me, software piracy is a bad thing (*)	Ajzen (1991)
	AT2	To me, software piracy is an unpleasant thing (*)	
	AT3	To me, software piracy is a smart thing	
Intention	IT1	In the future, I will carry out software piracy	Ajzen (1991)
	IT2	If the opportunity presents itself, I will carry out software piracy.	

Table1. Variables and Questionnaire

RESULT ANALYSIS

Data Collection and Method

In order to conduct empirical analysis 300 copies of the survey were distributed and 153 of them were retrieved (retrieval rate: 51.0%). Except for ones that could not be used, 145 final surveys were used for analysis. 93.1% (135 people) had more than twice experienced software piracy. 51.7% of responders were male (75 people), and 48.3% were female (70 people). The average age of responders was 22.6. The survey was conducted mainly targeting undergraduate (most of them are seniors) and graduate students who generally perform diverse projects in each lab. They use professional software such as statistical packages, GIS software and datamining tools as well as universal applications such as window and office. Hence survey data reflect software piracy in working places. In addition, their projects are progressed under relationship with government organizations or private enterprises. Therefore, constructs which are relevant to institution isomorphism theory are well explained with our survey data. We decided there is enough validity for our study.

To perform our analysis we used a Partial least Square and Structural Equation Modeling tool (PLS-graph). PLS is a structural equation modeling technique that can analyze structural equation models (SEM) involving multiple-item constructs. PLS is a very useful analysis tool under conditions of non-normality and relatively small to medium sample sizes method (Barclay, Hiffins and Tompson, 1995).

Measurement Assessment

Internal Consistency

In order to verify reliability, that is internal consistency of measurement, this study examined Cronbach's α. Table 2 shows Cronbach's α for each measurement variable. Except for attitude and intention, Cronbach's α of remaining variables was higher than the standard value of 0.7, and attitude and behavior intent had 0.686 and 0.685 respectively, which are acceptable values. The result of Cronbach's α reliability verified that reliability of measurement was valid.

	variable	loading	p value	mean	S.D.	Alpha	C.R.	AVE
Punishment Severity	PS1	0.880	p<0.01	5.59	1.29	0.751	0.858	0.67
	PS2	0.811	p<0.01	5.05	1.32			
	PS3	0.759	p<0.01	5.61	1.39			

Punishment Certainty	PC1	0.914	p<0.01	4.12	1.79	0.855	0.902	0.755
	PC2	0.936	p<0.01	4.37	1.75			
Software Cost	SC1	0.899	p<0.01	4.74	1.81	0.897	0.936	0.829
	SC2	0.929	p<0.01	4.19	1.89			
	SC3	0.903	p<0.01	4.34	1.77			
Mimetic Pressure	MP1	0.876	p<0.01	4.24	1.72	0.829	0.899	0.749
	MP2	0.860	p<0.01	4.19	1.42			
	MP3	0.860	p<0.01	4.58	1.72			
Coercive Pressure	CP1	0.860	p<0.01	4.16	1.77	0.866	0.917	0.787
	CP2	0.908	p<0.01	4.01	1.77			
	CP3	0.894	p<0.01	4.06	1.77			
Normative Pressure	NP1	0.851	p<0.01	4.03	1.86	0.820	0.894	0.738
	NP2	0.850	p<0.01	4.34	1.56			
	NP3	0.876	p<0.01	4.45	1.69			
Attitude	AT1	0.730	p<0.01	3.51	1.92	0.686	0.828	0.617
	AT2	0.847	p<0.01	3.13	1.84			
	AT3	0.775	p<0.01	3.14	1.96			
Intention	IT1	0.872	p<0.01	4.13	1.69	0.685	0.864	0.761
	IT2	0.873	p<0.01	3.99	1.81			

Table 2. Convergent Validity and Internal Consistency

Convergent validity and Discriminant Validity

In order to verify convergent validity and discriminant validity, confirmatory factor analysis was carried out. If factor loading was over 0.7, it was considered to have convergent validity. As can be seen in Table 2, all factor loadings were over 0.7. Therefore, according to the confirmatory factor analysis result conducted in this study, it was shown that measurement used in this study had convergent validity. Also, if composite reliability was over 0.7, it can be said that measurement has both internal consistency and convergent validity (Werts, Lin and Jöreskog, 1974). According to verification result, all measurements in this study showed over 0.8 and had suitable composite reliability Table 2. Furthermore, we examined AVE (Average Variance Extracted) of each latent variable. AVE shows one latent variable and variance size that measurement categories, which measure that latent variable, commonly hold. That is, if AVE is high, it means that variance of measurement categories that a latent variable is explaining is high, which also means that convergent validity is high. According to the AVE verification result, all AVE value ranges were in between 0.617 and 0.829, which are higher than standard 0.5 and so showed appropriate convergent validity. (Gefen, Straub and Boudreau, 2000)

	PS	PC	SC	MP	CP	NP	AT	IT
PS1	0.880	-0.028	0.195	-0.057	0.029	-0.069	-0.290	-0.077
PS2	0.811	0.080	0.158	0.059	0.089	0.002	-0.193	0.049
PS3	0.759	-0.030	0.207	0.152	0.056	0.016	-0.241	0.050
PC1	0.022	0.914	-0.011	0.093	-0.059	-0.089	-0.106	0.026
PC2	-0.008	0.936	0.078	0.247	0.064	0.068	-0.117	0.162
SC1	0.207	-0.021	0.899	-0.115	-0.085	-0.092	-0.218	-0.145

SC2	0.212	0.085	0.929	0.028	-0.091	-0.084	-0.264	-0.079
SC3	0.210	0.029	0.903	0.091	0.006	0.038	-0.263	-0.051
MP1	0.063	0.141	0.066	0.876	0.181	0.406	0.035	0.447
MP2	0.043	0.070	-0.102	0.860	0.188	0.284	0.130	0.474
MP3	0.033	0.262	0.061	0.860	0.207	0.316	0.134	0.496
CP1	-0.036	0.003	-0.031	0.181	0.860	0.253	0.190	0.329
CP2	0.097	0.003	-0.114	0.179	0.907	0.286	0.155	0.424
CP3	0.094	0.022	-0.007	0.233	0.894	0.326	0.151	0.399
NP1	0.084	-0.073	-0.033	0.373	0.277	0.851	-0.023	0.381
NP2	-0.036	0.020	-0.031	0.320	0.295	0.850	0.025	0.379
NP3	-0.102	0.031	-0.056	0.306	0.273	0.876	0.164	0.455
AT1	-0.256	-0.117	0.289	0.064	0.096	0.010	0.730	0.212
AT2	-0.256	-0.069	0.197	0.042	0.184	0.146	0.847	0.375
AT3	-0.203	-0.085	0.172	0.169	0.147	0.004	0.775	0.383
IT1	-0.009	0.064	0.062	0.501	0.388	0.449	0.301	0.871
IT2	0.006	0.139	0.107	0.454	0.374	0.379	0.427	0.873

Table 3. Cross-loading Table

In order to verify discriminant validity, cross-loading analysis and AVE square root analysis were conducted. As can be seen in the cross-loading table in Table 3, all loading of construct of latent variables were over 0.7 and all factor loading was significant at a confidence level of 0.01. Furthermore, for other constructs the loading was below 0.7. This shows that measurement has discriminant validity. AVE analysis compares the correlation between the AVE square root value of each latent variable and correlations among each latent variable. In cases where the AVE square root value is higher than the correlation among its latent variables and other variables, it is said to have discriminant validity. (Chin, 1998) As can be seen in Table 4, the AVE square root value is higher than the other correlations of verticals and horizontals, it proves that discriminant validity of measurement of this study have been ensured.

	PS	PC	SC	MP	CP	NP	AT	IT
PS	0.819							
PC	0.004	0.869						
SC	0.230	0.038	0.910					
MP	0.053	0.185	0.009	0.865				
CP	0.065	0.011	-0.060	0.223	0.887			
NP	-0.027	-0.005	-0.048	0.386	0.327	0.859		
AT	-0.302	-0.113	0.275	0.117	0.184	0.072	0.785	
IT	-0.001	0.117	0.097	0.547	0.437	0.474	0.418	0.872

Table 4. Discriminant Validity

Research model assessment

Figure 2 is the result of analysis of the study model using PLS based on the hypothesis constructed in this study, which represents path coefficient and R^2 value according to each group. Among the variables that have influence on attitude, only punishment severity (t=3.08) and software cost (t=2.80) have a significant influence at a confidence level of 0.01 and the remaining variable, punishment certainty, did not have a significant effect (t=1.25). Also, the institution isomorphism factors including mimetic pressure (t=5.13), coercive pressure (t=3.40), normative pressure (t=3.99) as well as attitude (t=5.33) had significant influence on intention. Among the two variables that have significant influence on attitude, punishment severity (-0.253) had greater influence than software cost (0.212). Also, path coefficient leading from attitude to intention had a high value (0.317) while institution isomorphism factor to mimetic pressure at 0.370 path coefficient had the greatest influence and coercive pressure had 0.218 and normative pressure had 0.238 path coefficient. Attitude was found to be explained 14.7% by punishment certainty, punishment severity, and software cost variables while behavior intention was explained 54.3% by attitude, mimetic pressure, coercive pressure, and normative pressure. As the result of hypothesis verification, among all hypotheses, except hypothesis 2, every hypothesis was selected at confidence level of 0.01.

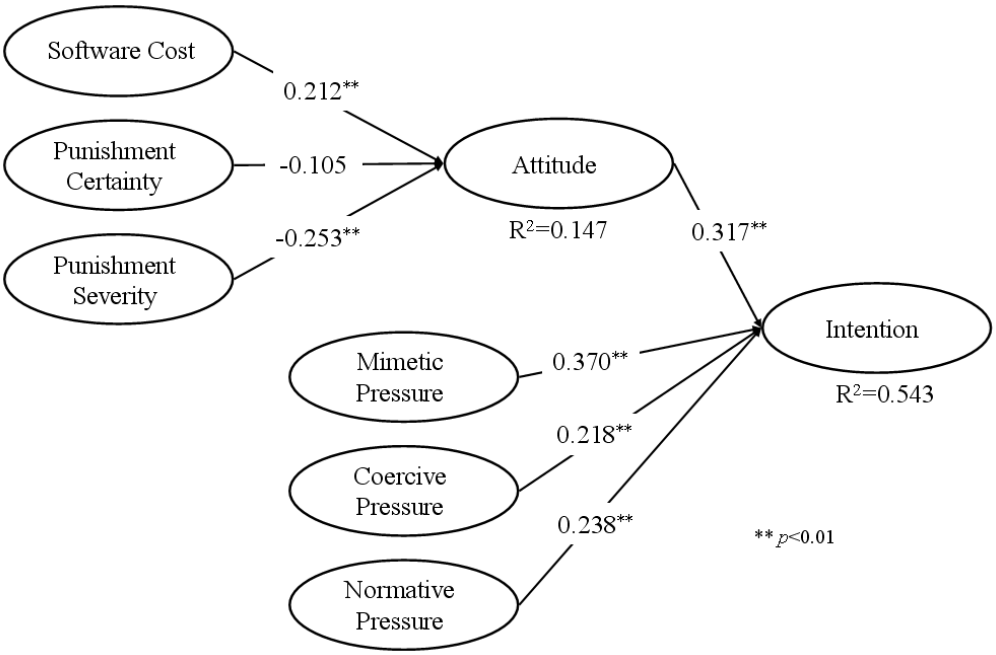

Figure 2. Data Analysis Result

IMPLICATIONS AND CONCLUSION

This study was conducted to examine the factors that motivate software piracy in the Vietnamese software market and to verify the significance of the influence. Especially, the perspectives of institution isomorphism, mimetic pressure, coercive pressure and normative pressure were used as factors that influence behavior intention, and by applying deterrence theory, we analyzed punishment severity and punishment certainty, which are social factors that deter software piracy, and finally by using software cost factor based on expected utility theory, we analyzed individual decision-making process when pirating software. Results show that mimetic pressure, coercive pressure and normative pressure, which have direct influence on behavior intention, all turned out to be factors that had significant influence. These are factors that induce software piracy, the psychology to mimic others, work connection with others and normative factors were greater in Vietnam. Especially, out of the three factors, mimetic software piracy had the strongest influence. And out of the factors that influence behavior intention through attitude, punishment severity and software cost had significant influence on software piracy intention. This means fear of severe punishment on the use of pirated software had positive influence on preventing software piracy, while high software cost had positive influence on the use of pirated software. The result that punishment severity is more important factor compared to punishment certainty is conflicting with Schaub (2004). This shows that Vietnamese government's policies which are relating to software piracy prevention are not effective.

This study gives the following implications. First, it shows that software piracy behavior can be explained by the institution isomorphism perspective. According to previous studies, institution isomorphism theory mainly explained phenomena such as an organization's new technology acceptance and institution introduction (Teo et al., 2003; Khalifa and Davison, 2006). However, this study proved that software piracy which is an individual decision-making process can be explained by institution isomorphism, deterrence theory and expected utility theory. Behavior intention, which is a dependent variable in our research model, had an enough R^2 at 0.543. Also, the second point is, while previous studies were conducted on developed countries, such as the United States, and faced many difficulties to generalize them to other developing countries having different social and economic situations, this study applied software piracy study to developing countries such as Vietnam. As a result, different from previous studies (Peace et al., 2003), punishment certainty was not a significant factor. Lastly, we verified effect of software cost on software piracy. The results of this study corroborate previous research (Gopal and Sanders, 2000). According to Gopal and Sanders (2000), GNP is an important factor to piracy rate. Because GNP is related to software cost, our study can be regarded to prove it.

Implications in practical dimensions are as follows. Foremost, mimetic pressure, coercive pressure and normative pressure through institution isomorphism were found to have a significant influence upon the intention to use pirated software. Through this finding it showed a general atmosphere in Vietnam as seeing software piracy as not an immoral act. It shows that they see peers who use pirated software benefiting from the use, and in reality receive offers to use pirated software, and individually, they also receive pressure to use pirated software because all others are using it. Therefore, in order to alter the atmosphere that justifies the usage of pirated software, social campaigns and education on intellectual property must be conducted, and create an atmosphere to promote licensed software usage such as using licensed software in public institutions. Secondly, previous studies showed that punishment certainty and punishment severity all had significant influence. (Peace et al., 2003) However in the case of Vietnam, of the factors influencing attitude, only punishment severity and not punishment certainty have significance, which means the Vietnamese are not aware of the punishment of piracy in Vietnam. This proves that with no concern to punishment present, the Vietnamese regard piracy as a natural behavior. However, in the case of punishment severity, with path coefficient (-0.253) it negatively influences the attitude, which means if punishment level is enforced and if people are aware of severe punishment following a piracy behavior, it could have great influence upon piracy prevention. Hence, Vietnamese government should strengthen punishment at the government level and bring about a positive influence upon software piracy prevention. Finally, it shows software cost having significant influence upon attitude. In the case of Vietnam the result proves, due to causes such as price differences, rather than purchasing licensed software, decision-making is accomplished in a way favoring the use of pirated software. Accordingly, in order to prevent piracy behavior, software providers must present a price that the Vietnamese can afford. For example, provide them with a high discount rate, or come up with other payment methods such as licenses will have significant influence upon piracy behavior prevention.

The foremost limit of this study is that most of subjects are graduate and undergraduate students in their 20s. Since they are more susceptible to their peers' influence compared to other generation, impacts of mimetic, coercive and normative pressure might be highly measured. Thus it is difficult to generalize this study's result to a general situation in the software piracy market. Furthermore, attitude R^2 value which is explained by factors that influence attitude showed 0.147, which was not high enough. This proves that there are other factors influencing pirated software use. Therefore, in future studies if mediating variables such as individual personality, living standards, gender, and social status are used it could better explain the pirated software usage phenomenon. Also, through study results using mediating variables it would aid in setting adequate strategies for preventing software piracy. Besides, if a moral decision factor, by which an individual can be judged voluntarily whether to use pirated software, and an intellectual factor of software piracy are added to further studies, it would bring about more interesting results.

REFERENCE

1. Ajzen, I. (1991) The Theory of Planned Behavior, Organizational Behavior and Human Decision Processes, 50, 2, 179-211.
2. Ajzen, I. (2001) Nature and Operations of Attitudes, Annual Review of Psychology, 52, 27–58.
3. Al-Rafee, S., Cronan, T. P., (2006) Digital piracy: Factors that influence attitude toward behavior, Journal of Business Ethics, 63, 237-259
4. Allport, G. (1935) Attitudes, C. Murchison (ed.), Handbook of Social Psychology. Clark University Press, Worcester, MA, 798–844.
5. Barclay, D., Hiffins, C. and Tompson, R (1995) The partial least square(PLS) approach to causal modeling, personal computer adoption and use as an illustration, Technology studies, 2, 2, 285-309.

6. Bouchard, L. (1993) Decision Criteria in the Adoption of EDI, Proceedings of the Thirteenth International Conference on Information Systems, 5, 8, 365-376.
7. BSA (2006) BSA report 2006, Available at http:/www.BSA.ORG/GLOBALSTUDY.
8. Burt, R.S. (1987) Social Contagion and Innovation: Cohesion Versus Structural Equivalence, The American Journal of Sociology, 92, 6, 1287-335.
9. Cheng, H.K., Sims, R.R. and Teegen, H. (1997) To purchase or to pirate software: An empirical study, Journal of Management Information Systems, 13, 4, 49-60.
10. Chin, W.W. (1998) Issue and Opinion on Structural Equation Modeling, MIS Quarterly, 22, 1, 7-16.
11. Conner, K.R. and Rumelt, R.P. (1991) Software Piracy: An Analysis of Protection Strategies, Management Science, 37, 2, 125-39.
12. DiMaggio, P.J. and Powell, W.W. (1983) The Iron Cage Revisited: Institutional Isomorphism And Collective Rationality In Organizational Fields, American Sociological Review, 48, 2, 147-60.
13. Ehrlich, I. (1996), Crime, punishment and the market for offences, Journal of Economic Perspectives, 10, 1, 43-68.
14. Erickson, B. (1988) The Relational Basis of Attitudes in Social Structures, Cambridge University Press, 99-121.
15. Flanagin, A.J. (2000) Social Pressures on Organizational Website Adoption, Human Communication Research, 26, 4, 618-646.
16. Gefen, D., and Straub, D., and Boudreau, M (2000) Structural Equation Modeling and Regression: Guidelines for Research Practice, Communications of the AIS, 4, 7, 1-77.
17. Givon, M., Mahajan, V. and Muller, E. (1995) Software piracy: Estimation of lost sales and the impact on software diffusion, Journal of Marketing, 59, 1, 29-37.
18. Gopal, R.D. and Sanders, G.L. (1997) Preventive and deterrent controls for software piracy, Journal of Management Information Systems, 13, 4, 29-48.
19. Gopal, R.D. and Sanders, G.L. (1998) International Software Piracy: Analysis of Key Issues and Impacts, Information Systems Research, 9, 4, 380-397.
20. Gopal, R.D. and Sanders, G.L. (2000) Global Software Piracy: You can't get blood out of a turnip, Communications of the ACM, 43, 9, 82-89.
21. Gopal, R. D., Sanders G. L., Bhattacharjee, S., Agrawal, M., Wagner, S. C. (2004) A behavioral model of digital music piracy, Journal of Organizational Computing and Electronic Commerce, 14, 2, 89-105
22. Hu, Q., Hart, P. and Cooke, D. (2007) The role of external and internal influences on information systems security - a neo-institutional perspective, The Journal of Strategic Information Systems, 16, 2, 153-172.
23. Huff, S.L. and Munro, M.C. (1985) Information Technology Assessment and Adoption: A Field Study, MIS Quarterly, 9, 4, 327-339.
24. Jepperson, R.L. (1991) Institutions, institutional effects, and institutionalism. In P. J. DiMaggio and W. W. Powell (Eds.), The new institutionalism in organizational analysis, University of Chicago Press, 143-62.
25. Khalifa, M. and Davison, R.M. (2006) SME Adoption of IT: The Case of Electronic Trading Systems, IEEE Transactions on Engineering Management, 53, 2, 275-284.
26. Koen Jr, C.M. and Im, J.H. (1997) Software piracy and its legal implications, Information and Management, 31, 5, 265-272.
27. Moores, T. and Dhillon, G. (2000) Software Piracy: A View from Hong Kong, Communications of the ACM, 43, 12, 88-93.
28. Peace, A.G. (1997) Software Piracy and Computer-Using Professionals: a survey, Journal of Computer Information Systems, 38, 1, 94-99.
29. Peace, A.G., Galletta, D.F. and Thong, J.Y.L. (2003) Software Piracy in the Workplace: A Model and Empirical Test, Journal of Management Information Systems, 20, 1, 153-177.
30. Powell, W.W., and DiMaggio, P. J., (1991) The New Institutionalism in Organizational Analysis, University of Chicago Press.
31. Schaub Jr, G. (2004) Deterrence, Compellence, and Prospect Theory, Political Psychology, 25, 3, 389-411.

32. Straub Jr, D.W. and Collins, R.W. (1990) Key Information Liability Issues Facing Managers: Software Piracy, Proprietary Databases, and Individual Rights to Privacy, MIS Quarterly, 14, 2, 143-156.
33. Sundararajan, A. (2004) Managing Digital Piracy: Pricing and Protection, Information Systems Research, 15, 3, 287-308.
34. Teo, H.H., Wei, K.K. and Benbasat, I. (2003) Predicting Intention To Adopt Interorganizational Linkages: An Institutional Perspective, MIS Quarterly, 27, 1, 19-49.
35. Tingling, P., and Parent, M (2002) Mimetic isomorphism and technology evaluation: does imitation transcend judgment, Journal of the Association for Information Systems, 3, 5, 113-43.
36. Tolbert, P.S. and Zucker, L.G. (1983) Institutional Sources of Change in the Formal Structure of Organizations: The Diffusion of Civil Service Reform, 1880-1935, Administrative Science Quarterly, 28, 1, 23-39.
37. Werts, C.E., Lin, R.L. and Jöreskog, K.G (1974) Intraclass Reliability Estimates: Testing Structural Assumptions, Educational and Psychological Measurement, 34, 1, 25-33.