

Software Piracy among Information Technology Professionals in Thailand

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Abstract

The study investigated factors influencing ethical intentions in relation to the personal use of software among Information Technology (IT) professionals in Thailand. Factors expected to affect ethical intentions were derived from previous studies and used to formulate a theoretical model based on the theory of planned behavior, the Big Five personality traits, deterrent theory, and moral intensity. The model was tested and developed using data collected by questionnaire from 452 professionals working in various IT positions. The findings confirmed the importance of the effects of social norms and moral intensity on attitudes and the effects of agreeableness, openness, perceived behavioral control, moral intensity, punishment severity, and attitude on ethical intentions. New findings are presented concerned with the influence of gender on attitude as well as the influence of social norms, conscientiousness, neuroticism, and gender on ethical intentions. Practical actions are recommended for improving ethical intentions.

Keywords: IT professionals; Software piracy; Ethics; Moral intensity; Personality traits; Deterrent theory

Introduction

Software is a renowned tool for improving productivity and helping businesses operate more efficiently. Nevertheless, individuals including Information Technology (IT) professionals in Thailand still opt for pirated software over genuine software. Again and again, this has proven to be a risky decision for both individuals and organizations. Companies using pirated software face legal consequences from violating the Thai Copyright Act, which requires companies to honor the intellectual property rights and licensing agreements of software providers. Police raids, fines, business disruption and even jail sentences for users are all possible outcomes of using pirated software in Thailand.

Pirated software leaves users vulnerable to a variety of potentially ruinous scenarios. In business pirated software is likely to result in errors that require system-wide downtime. Pirated software is vulnerable to security risks leading to personal data lost, fraud, and crimes. With the explosion of Internet usage cyber crimes have increased dramatically and one of the many lapses which cyber criminals look at is the vulnerability of non-genuine pirated computer software. In addition, software piracy contradicts IT professional ethics. In the Asia Pacific region in 2014, Thailand ranked seventh with a piracy rate of 72 percent followed Bangladesh, Pakistan, Indonesia, Sri Lanka, Vietnam, and China with rates ranging from 72 percent to 90 percent. In term of the commercial value of pirated software, Thailand ranked 15th in the world at USD852 million. This placed Thailand among the thirteen countries on the U.S Trade Representative's "Priority Watch List" of countries considered to be the most serious violators of intellectual property rights (Office of the United States Trade Representative Report 301, 2014)

This study focuses on software piracy among IT professional in Thailand. The study examines factors that influence an individual's decision to use illegal software instead of copyright software for their personal use. This deliberately excludes the use of software in the individual's workplace and consequently reflects the individual's attitude to software piracy distinct from their organization's approach to the use of software. The study addresses

the effects of psychological factors on an IT professional's attitude and intention toward software piracy and these factors have received little attention in previous studies. In particular, following Devaraj and Easley (2008) the five factor model of personality due Digman (1990) is used to examine the role of personality traits in relation to attitude and intentions towards software piracy.

The research design and methodology for the study is presented next . This is followed by a review of the related literature which forms the basis for the formulation of the theoretical model for the study . Section 5 presents the results of the data preparation and preliminary statistical analyses. This leads to the analysis and development of the theoretical model in order to produce a final model. The findings of the study are discussed in the next section and conclusions are drawn in the last section.

Research Design and Methodology

The research was: partly basic and applied; partly descriptive and explanatory; cross-sectional in time; and used quantitative data analysis techniques. The target population was individual IT professionals who were at least 20 years of age with considerable work experience in IT. The size of the target population in Thailand exceeds 100,000. Consequently, using a level of precision of 5 percent, and a 95 percent confidence interval the minimum sample size for the study was determined to be approximately 400 (<https://edis.ifas.ufl.edu/pd006>). This sample size also satisfied the statistical validity of the structural equation modeling (SEM) and other quantitative techniques used in the data analyses (Kline, 2005).

A self-administered questionnaire, prepared in the English and Thai languages, was used to measure characteristics of the respondents and the variables in the theoretical model. Both language versions were reviewed by a focus group of five representatives of the target population. Suggested modifications were included in revised versions of the questionnaire which was then administered in a pilot study using a sample of 10 suitable participants. Their responses and comments were noted and any necessary modifications were incorporated into the final English and Thai versions of

the questionnaire. The final Thai language version was used in the full study. A notated version of the questionnaire is included in Appendix A1.

Questionnaires were distributed through the researcher's personnel contacts in various IT companies and well-known IT Associations and Forums in Thailand (e.g. TISA (Thailand Information Security Association), the Thai Programmer Forum). The questionnaire was available in both hard and soft copy forms (both on-line via Google Form and off line print out) with a cover letter which introduced the purpose of the study and provided instructions for its completion. A sample of 495 completed questionnaires was obtained. The responses were entered into an SPSS worksheet and 50 (10 percent) were selected randomly and the accuracy of data entry was checked. No errors were found and there were no missing values. It was necessary to remove 43 questionnaires from the sample because they contained at least one outlier value for at least one of the values of the model variables (i.e. a value 3 or more standard deviations from the mean). This left a final sample of 452 questionnaires which was very satisfactory in relation to the required sample size of 400.

Related Literature

The review includes an overview of previous studies related to behavioral research concerning professional ethics and moral, personality traits, digital and software piracy, and deterrent theory and individual attributes. Studies related to influential models and important variables concerned with software piracy are examined in order to form a basis for the development of a theoretical model which is presented in theoretical model formation section.

An Overview of Previous Studies

Table 1 presents an overview of the nature and purpose of previous studies of IT ethics, software piracy, and related behavioral science. This summary illustrates the breadth of possible factors that have been identified as issues that influence unethical intentions. The studies span the period from 1996 -2013 and include studies conducted in Thailand and overseas. Most studies are quantitative with some involving case studies. The unit of

analysis was an individual and data was collected using questionnaires and interviews from both primary and secondary sources.

Table 1 Previous Studies about IT Ethics, Software Piracy and Related Behavioral Science

Project Title	Research Approach	References
Perceptions about ethics institutionalization and quality of work life: Thai versus American marketing managers	Explanatory	Marta et al. (2013)
An Exploratory Examination of Antecedents to Software Piracy: A Cross-Cultural Comparison	Explanatory	Aleassa et al. (2012)
The effects of personality traits and cognitive moral development on ethical -intent in accounting and non-accounting major professionals	Explanatory	Woodridge (2012)
The relationship between personality traits and information competency in Korean and American students	Explanatory	Song (2012)
Modeling Software Piracy in Developed and Emerging Economies	Explanatory	Reinig and Plice (2012)
Do Personality Traits of accountants affect their performance and ethical judgment?	Explanatory	Saadullah (2011)
Students ‘ Ethical Decision-Making in an Information Technology Context : A Theory of Planned Behavior Approach	Explanatory	Riemen et al. (2011)
Investigating consumers’ software piracy using an extended theory of reasoned action	Explanatory	Aleassa (2009)
An Empirical Investigation of the relationships between Moral Intensity and Ethical Decision Making in Electronic Commerce	Explanatory	Wu and Yang (2009)
Personality and ethical decision: an empirical investigation of personality traits and moral philosophy	Explanatory	Hartmann (2011)

Table 1: Previous Studies about IT Ethics, Software Piracy and Related Behavioral Science (continued)

Project Title	Research Approach	References
Shoplifting, unethical consumer behavior, and personality	Explanatory	Egan and Taylor (2010)
The intention to download music files in a P2P environment: Consumption value, fashion, and ethical decision perspectives	Explanatory	Chen et al. (2008)
Unethical Behavior using information technology (music download among business student)	Explanatory	Chaterjee (2008)
Moral judgment development across cultures: Revisiting -Kohlberg's universality claims	Explanatory	Gibbs et al. (2007)
Personality Traits and Job Success: An investigation in a Thai sample	Explanatory	Smithikrai (2007)
Software Piracy among Accounting Students: A Longitudinal Comparison of Changes and Sensitivity	Explanatory	Wooley et al. (2006)
Individual characteristics and ethical decision-making in an IT context	Explanatory	Haines and Leonard (2007)
Ethical Decision Making in the Public Accounting Profession: An Extension of Ajzen's Theory of Planned Behavior	Explanatory	Buchan (2005)
Differences in the Perceptions of Moral Intensity in the Moral Decision Process : An Empirical Examination of Accounting Students	Explanatory	Leitsch (2004)
Software Piracy in the workplace :A Model and Empirical Test	Explanatory	Peace et al. (2003)
The Effect of Context on Moral Intensity of Ethical Issues: Revising Jones's Issue-Contingent Model	Explanatory	Kelly and Elm (2003)
An exploratory study of moral intensity regarding software piracy of students in Thailand	Explanatory	Kini et al. (2003)
Digital piracy: Ethical decision-making	Explanatory	Al -Rafee (2002)
Software piracy and ethical decision making	Explanatory	Wagner (1998)

Table 1: Previous Studies about IT Ethics, Software Piracy and Related Behavioral Science (continued)

Project Title	Research Approach	References
Perceived Importance of Ethics and Ethical Decisions in Marketing	Explanatory	Singhapakdi (1999)
Moral Intensity and Ethical Decision making of Marketing Professionals	Explanatory	Vitell et al. (1996)

From Table 1 Previous researches which studied factors related to this study were examined. Despite some studies on software piracy and ethics, none have examined specifically personality traits. Also, the most recent study in Thailand was conducted more than 10 years ago (Kini et al., 2003) focusing on business students rather than IT professionals and there has been a call from scholars for research outside USA (Chaterjee, 2008; Ariely, 2006). Consequently, this study serves to address the need for further studies of software piracy outside of USA and specifically in Thailand.

Models and Model Variables

This study considered many aspects of unethical behavior in order to explore and understand an IT professional’s behavior related to the personal use of illegal software. Social norms and individual attributes such as personality traits were considered as important constructs in the construction of the proposed software piracy model. The Theory of Reasoned Action (TRA) and the Theory of Planned Behavior (TPB) (Ajzen, 1991) were among the well known behavioral theories that were considered as fundamental to the development of the theoretical model for the study. These theories have been used extensively to understand human behavior in a variety of situations (Sheppard et al., 1988; Madden et al., 1992; Legris et al., 2003). This study is strongly influenced by TPB which was based upon the TRA but, in addition to attitude and subjective norms, it included perceived behavioral control as a third factor that influences behavioral intention. Perceived behavioral control refers to *how easy or difficult it is for the subject to perform a specific behavior*. This fits well with the context

of ethical behavior because people always consider an opportunity to perform ethical or unethical behavior based on the possibility of success. Moreover, the TPB has been used in contexts other than software piracy to successfully identify and explain ethical behavior (Dubinsky and Loken, 1989; Randall and Gibson, 1991).

In previous studies moral sensitivity, perceived behavioral control, and subjective norms were established as factors leading to ethical intention among public accountants. Buchan (2005) showed that ethical intention was positively influenced by attitudes but none of the other variables had a significant direct effect although there was an indirect effect of subjective norms on intention via attitude which was different from the original TPB. Singhapakdi et al. (2000) investigated whether ethical intentions of Thai managers were associated with ethical values. The results indicated that ethical perceptions were significant predictors of a Thai manager's intention for ethical decision making. Straub and Nance (1990) identified various *preventive control* and *deterrent controls* for combating computer hardware abuse. Siponen et al. (2012) studied the effects of shame as a deterrent technique on intention to pirate software with 183 employees in Finland and found that informal deterrents such as shame and moral belief are also strong predictors of intentions. Peace et al. (2003) tested the effect of attitude and subjective norms on software piracy intention also considering the effects of punishment severity, software cost, punishment certainty, and perceived behavioral control on piracy intention. Peace et al. (2003) confirmed the hypothesis that attitude and subjective norms positively influence intention to commit software piracy. They also found that punishment severity, punishment certainty, and software cost significantly affected attitude toward software piracy while perceived behavioral control had a positive effect on intention to pirate software. Chaterjee (2008) studied the effect of moral intensity that leads to attitude toward intention to perform unethical behavior using IT and found that moral intensity had an effect on ethical behavior. Wooldridge (2012) studied the effects of personality traits

and behavioral differences on ethical awareness, ethical judgment, and ethical intent in accounting and non-accounting professionals and students but found only neuroticism to have a significant and negative relationship with ethical intent.

Based on the overview of previous studies in Table 1, the TPB by Ajzen (1991), as well as the role of personality traits, moral intensity, deterrent constructs, and gender in the findings from previous studies a theoretical model for the study was formulated.

Theoretical Model

The theoretical model is shown in Figure 1. The model is notated to indicate the direct causal effects associated with the 16 research hypotheses in Table 2. There are 13 variables including 11 exogenous variables, for which no causes are proposed, and two endogenous variables, which have at least one variable as a proposed cause. The endogenous variable Ethical Intention is the dependent variable and Attitude is an intervening variable. Apart from the variable Gender, each of the other 12 variables is a latent variable measured with more than one indicator.

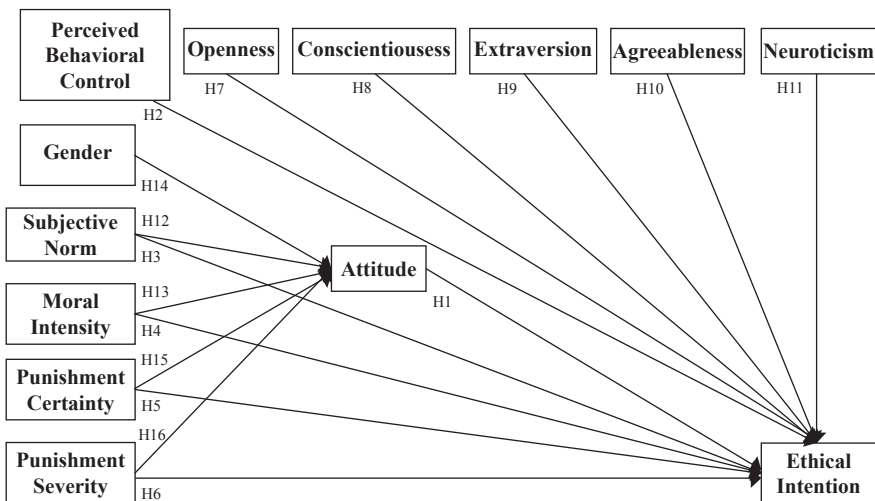


Figure 1 Theoretical Model

Table 2 Research Hypotheses Associated with the Theoretical Model

Hypothesis	Reference
H1 Attitude has a significant positive direct effect on Ethical Intention	Aleassa et al. (2012)
H2 Perceived Behavioral Control has a significant positive direct effect on Ethical Intention	Riemenschneider (2011)
H3 Social Norm has a significant positive direct effect on Ethical Intention	Aleassa et al. (2012)
H4 Moral Intensity has a significant positive direct effect on Ethical Intention	Wu and Yang (2009)
H5 Punishment Certainty has a significant positive direct effect on Ethical Intention	Chaterjee (2008)
H6 Punishment Severity has a significant positive direct effect on Ethical Intention	Chaterjee (2008)
H7 Openness has a significant positive direct effect on Ethical Intention	Wooldridge (2012)
H8 Conscientiousness has a significant positive direct effect on Ethical Intention	Wooldridge (2012)
H9 Extraversion has a significant positive direct effect on Ethical Intention	Wooldridge (2012)
H10 Agreeableness has a significant positive direct effect on Ethical Intention	Wooldridge (2012)
H11 Neuroticism has a significant Negative direct effect on Ethical Intention	Wooldridge (2012)
H12 Social Norm has a significant positive direct effect on Attitude	Aleassa et al (2006)
H13 Moral Intensity has a significant positive direct effect on Attitude	Chaterjee (2008)
H14 Gender has a significant direct effect on Attitude	Al-Rafee et al. (2006)
H15 Punishment Certainty has a significant positive direct effect on Attitude	Peace et al. (2003)
H16 Punishment Severity has a significant positive direct effect on Attitude	Peace et al. (2003)

Note: Significant effects are statistically significant at a level of 0.05 or less.

Table 3 presents the operational definition for each of the thirteen variables in the theoretical model and the indicators used for the 12 latent

variables. References to previous studies are included as the sources for the definitions and existing measuring instruments.

Table 3 Operational Definitions and Measurement of Model Variables

Variable (Symbol)	Definition	Reference	Indicators	Existing Measuring Instrument
Gender (G)	Gender measured as male or female	Al-Rafee and Cronan (2006)	None	None
Moral Intensity (MI)	Moral intensity evaluates the characteristics of the issue at hand that influence ethical decision making	Jones (1991)	MI1-6	Chaterjee (2008)
Punishment Certainty (PC)	The probability of punishment occurring	Peace et al. (2003)	PC1, 2	Peace et al. (2003)
Punishment Severity (PS)	The level of punishment	Peace et al.(2003)	PS1, 2	Peace et al. (2003)
Openness (OP)	The propensity of an individual to display imagination, curiosity, originality, and open-mindedness. Individuals with low openness tend to be practical, traditional, and down-to-earth.	McCrae (1996)	OP1-10	Wooldridge (2012)
Agreeableness (AG)	The extent to which an individual is courteous, kind, flexible, trusting, and forgiving.	Jensen-Campbell et al. (2002)	AG1-9	
Extraversion (EX)	The extent to which an individual is outgoing, active, assertive, and talkative.	Wehrli (2008)	EX1-8	

Table 3 Operational Definitions and Measurement of Model Variables
(Continued)

Variable (Symbol)	Definition	Reference	Indicators	Existing Measuring Instrument
Conscientiousness (CC)	The extent that an individual is dependable, careful, responsible, organized, and has a high will to achieve in doing something.	De Raad and Schouwenburg (1996)	CC1-9	
Neuroticism (NU)	The extent to which an individual experiences and displays negative effects like anxiety, sadness, embarrassment, depression, guilt, and it is tied to the ability to cope with stress.	Wehrli (2008)	NU1-8	
Social Norms (SN)	Rules of behavior that cause an individual in a community to conform whenever they interact with others in the community.	Lewis (1969)	SN1-3	Peace et al.(2003)
Attitude (AT)	The degree to which an individual favorably or unfavorably evaluates ethical behavior.	Stone et al. (2009)	AT1-4	Peace et al.(2003)
Intention (IN)	A user's willingness to continue to display ethical behavior	Jin et al. (2009)	IN1-6	Chaterjee (2008)
Perceived Behavioral Control (PBC)	The extent to which an individual perceives that they are in control of their ethical behavior.	Chen et al., 2009	PBC1, 2	Peace et al.(2003)

Data Preparation and Preliminary Analyses

Data Preparation

Principal Component factor analysis was used to test the construct (discriminant and convergent) validity of the measures of the latent model variables. “Principal Component factor analysis was used an acceptable alternative to confirmatory factor analysis (Straub et al., 2004).”

Satisfactory construct validity required that each latent variable was measured by a different set of indicators with factor loadings of magnitude at least 0.4 and an associated eigenvalue of at least 1 (Straub et al., 2004). The results for the final factor analysis are shown in Appendix Table A1 where it is seen that some of indicators for Conscientiousness (CC 2, 4, 5, 9), Extraversion (EX 2, 5, 7), and Agreeableness (AG 7) were removed because they cross loaded significantly on more than one of the latent variables. As shown in Appendix Table A1 all of the other indicators had very satisfactory construct validity.

The internal consistency (equivalence) reliability of the final sets of valid indicators for the latent variables was measured using Cronbach alpha coefficients. The coefficients are shown in Appendix Table A2 and the reliability of the sets of indicators were good or excellent (George and Mallery, 2003).

Characteristics of Respondents

Appendix Tables A3 and A4 display personal and work characteristics of the respondents determined from the responses to the items in section 1 of the questionnaire. The sample of 452 individuals included 269 males (60 percent) and 183 females (40 percent). The average age of respondents was 31 years with respondents mainly in the age categories 20-24 years (28 percent) and 25-29 years (26 percent) and the rest were between age 30 years and 64 years. Ninety six percent of the respondents hold a Bachelor degree or higher and work across a wide range of IT positions. Thus, the respondents were well educated, mature,

and have sufficient work experience to be able to provide reliable and valid responses to the questionnaire items.

Descriptive Analysis of Model Variables

Appendix Table A5 shows the values of descriptive statistics for each of the model variables. For the twelve latent variables distributions for the indicators are shown separately as well as the distribution for each latent variable using single scale measures computed using the mean of the values of the indicators assigned by each respondent. The use of these single scale measures for the latent variables in the descriptive analyses throughout this section is justified by the very satisfactory construct validity and equivalence reliability of the indicators described above. These simplified measures of the latent variables are used in the preliminary descriptive analyses presented in this section but the full set of measures for the indicators were used in the SEM analyses presented in section 6 “It is noted from Appendix Table A5 that among the distributions of the indicators for the latent variables the maximum value for the magnitude of skewness is 0.594 and the maximum value for the magnitude of kurtosis is 0.528. As recommended by Kline (205) these values are well within the limits of 3 for the magnitude of skewness and 7 for the magnitude of kurtosis and indicate that the distributions of the indicators have not deviated from normality to an extent that would violate the use of maximum likelihood estimation in subsequent SEM analyses.”

The model variables and indicators were measured on 5-point Likert scales where 3 represented a *neutral* attitude to the construct being measured. T-tests showed that the mean values of most of the model variables were significantly greater than a *neutral* value ($p < 0.001$). This indicated that: **(a)** All of the personality traits are strongly represented in the sample except for Neuroticism; **(b)** Respondents consider that the probability of punishment and the level of punishment associated with engaging in software piracy are both high; **(c)** The respondents consider that the moral intensity associated with the act of software piracy is an important issue; **(d)** In the context of software piracy the respondents evaluate ethical behavior highly but on average

their willingness to continue to display ethical behavior in this context is only slightly above a neutral level; and **(e)** Social norms of behavior that cause an individual to conform whenever they interact with others in the community and the extent to which an individual perceives that they are in control of their ethical behavior are only considered by the respondents to have a neutral level of importance in relation to software piracy.

T-tests were used to compare the mean values for males and females among the 12 model variables. There was a statistically significant difference between males and females for only two model variables Perceived Behavioral Control and Moral Intensity and the two personal characteristics age and work experience. T-tests indicated that: **(a)** On average males (32 years, standard deviation 9) are significantly older than females (30 years, standard deviation 8); **(b)** On average males (5 years, standard deviation 4) have significantly more work experience than females (4 years, standard deviation 4); **(c)** In the context of software piracy males perceive that they are in control of their ethical behavior (mean 3.3, standard deviation 0.8) to a significantly greater extent than females (mean 2.8, standard deviation 1.1); **(d)** Females consider the moral intensity associated with software piracy (mean 3.5, standard deviation 0.8) to be significantly stronger than males (mean 3.3, standard deviation 3.5). However, Gender does not have a statistically significant effect on Attitude as proposed in the theoretical model and consequently Gender may be removed from the theoretical model to form the modified theoretical model. It also means that the research hypothesis H14 (Table 3) that *Gender has a significant direct effect on Attitude* is not supported.

Appendix Table A6 displays the correlation coefficients among the profile variables and the model variables excluding Gender. It is seen that: **(a)** Not surprisingly, older (younger) individuals have higher (lower) levels of education and more (less) work experience and they are more (less) conscientious; **(b)** The five personality traits are significantly correlated with each other and as expected these

correlations are positive except for those involving Neuroticism; and (c) Surprisingly, Neuroticism is significantly positively correlated with Intention whereas the expectation was that the correlation would be negative and this finding will be considered further in the model analysis in the next section.

From Table A6 it is seen that nine of the 15 direct causal effects in the theoretical model are associated with statistically significant correlations ($p < 0.05$). Although statistically significant correlations do not guarantee significant causal effects the significant correlation between Conscientiousness and Attitude suggests that in the development of the theoretical model the direct effect Conscientiousness \rightarrow Attitude may be considered as an addition to the theoretical model.

Model Analysis and Development

As described above, Gender was removed from the theoretical model and SEM analysis was used to determine the direct effects in the model shown in Table 4.

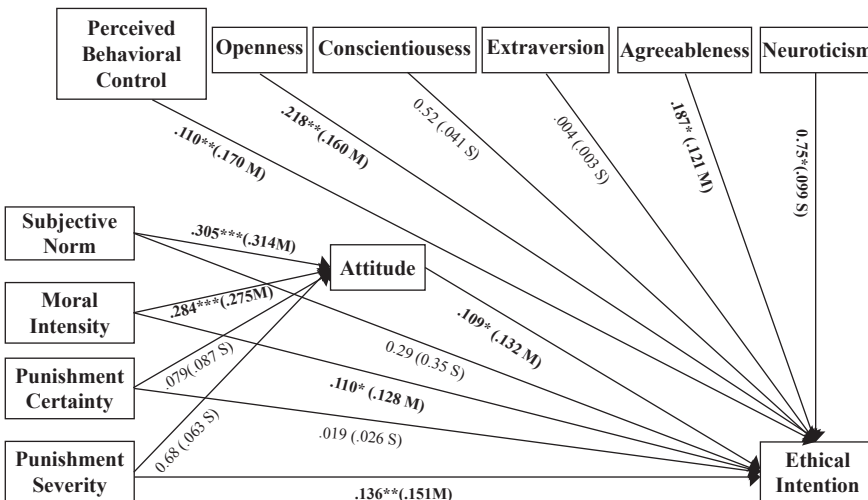


Figure 2 Theoretical Model

Table 4 Direct Effects in the Theoretical Model

Effect	Unstandardized	Sig.	Standardized	Magnitude
SN→AT	.305	***	.314	M
MI→AT	.284	***	.275	M
PC→AT	.079	NS	.087	S
PS→AT	.068	NS	.063	S
PBC→IN	.110	**	.170	M
OP→ IN	.218	**	.160	M
CC→ IN	.052	NS	.041	S
EX→ IN	.004	NS	.003	S
AG→ IN	.187	*	.121	M
NU→ IN	.075	*	.099	S
SN→ IN	.029	NS	.035	S
MI→ IN	.110	*	.128	M
PC→ IN	.019	NS	.026	S
PS→ IN	.136	**	.151	M
AT→ IN	.109	*	.132	M

Notes: (a) *, **, and *** indicate statistically significant at a level of 0.05, 0.01, and 0.001, respectively, and NS indicates not statistically significant at a level of 0.05 or less; (b) As described by Cohen (1988): Large (L), Medium (M), and Small (S) effects are those with magnitudes less than 0.1 (S), 0.1 to less than 0.5 (M), and 0.5 or more (L), respectively.

Table 5 presents the values of the range of fit statistics recommended by Kline (2005) that are associated with the SEM analysis of the theoretical model.

Table 5 Fit Statistics for the Theoretical Model

N	Normed Chi-square	NC (χ^2/df)	RMR	GFI	AGFI	NFI	IFI	CFI	RMSEA
452	$\frac{2746.246}{1709} = 1.607$		0.027	0.830	0.812	0.872	0.948	0.947	0.037
R²: AT(35 percent), IN(10 percent)									

Note: R² is the proportion of the variance of each endogenous variable that is explained by the variables affecting it.

The fit statistics in Table 5 are reasonable but from Table 4 there are seven direct effects (PC → AT, PS → AT, CC → IN, EX → IN, NU → IN, SN → IN, and PC → IN) which are small and/or are not statistically significant ($p < 0.05$) and it is possible that the model fit may be improved if these were removed. Also, from Appendix Table A6 it was noted that the effect CC → AT may be an added to the model. Consequently, these eight direct effects were made optional and the hierarchy of 28 (256) models was analyzed using the specification search facility in Amos. Following the recommendation by Kline (2005) the model in then hierarchy with the smallest value for NC was selected as the final model. The final model is displayed in Figure 2 with fits statistic in Table 6.

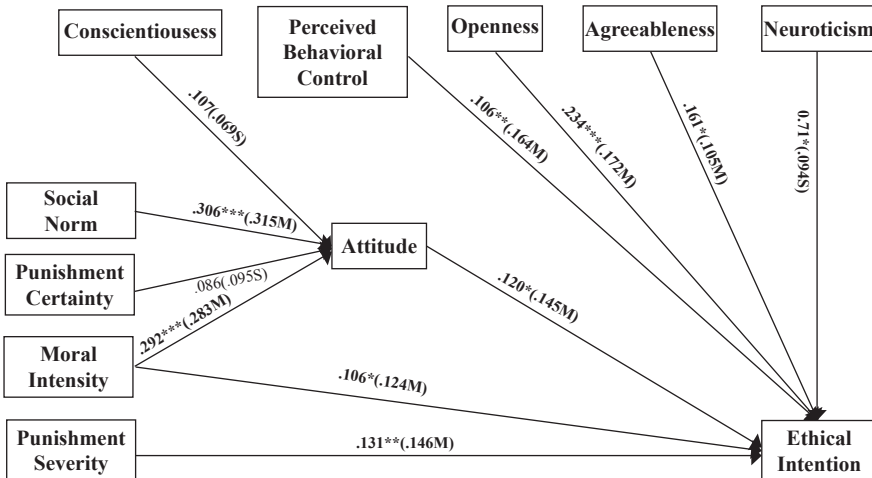


Figure 3 Final Model

Table 6 Fit Statistics for the Final Model

N	Normed Chi-square	NC (χ^2/df)	RMR	GFI	AGFI	NFI	IFI	CFI	RMSEA
452	2746.142/1713 = 1.603		0.027	0.913	0.902	0.932	0.948	0.947	0.037
R ² : AT (55 percent), IN (57 percent)									

From Figure 2 and Table 6 it is seen that compared to the theoretical model the fit statistics have improved slightly but importantly the final model is simpler with 11 variables instead of 12 and 11 direct effects instead of 15. The two small direct effects in

the final model (Punishment Certainty → Attitude, Conscientiousness → Attitude), which are not statistically significant, were not removed from the final model because that would increase the value of NC and the model with the minimum value for NC is specified by Kline (2005) as the final model.

All the effects in the final model are shown in Table 7 where: **(a)** the variables on indirect paths are shown; **(b)** the same notations as in Table 4 are used; **(c)** the determination of the statistical significance of effects followed the methods proposed by Sobel (1986) for indirect effects with one intervening variable and Cohen and Cohen (1983) for indirect effects with more than one intervening variable; and **(d)** the results of nonparametric bootstrapping using 1,000 random samples was used to determine the statistical significance of the totals of indirect effects and the totals of all effects.

Table 7 Analysis of the final model

Variable	Effect	Intervening Variable	Dependent Variable
		Attitude (AT)	Intention (IN)
Punishment Severity (PS)	Direct	Nil	.131**(.146M)
	Indirect	Nil	Nil
	Total	Nil	.131**(.146M)
Punishment Certainty (PC)	Direct	.086(.095S)	Nil
	Indirect	Nil	PC-AT-IN: .010(.014S)
	Total	.086(.095S)	.010(.014S)
Social Norms (SN)	Direct	.306***(.315M)	Nil
	Indirect	Nil	SN-AT-IN: .037*(.046S)
	Total	.306***(.315M)	.037*(.046S)
Conscientiousness (CC)	Direct	.107(.069S)	Nil
	Indirect	Nil	CC-AT-IN: .013(.010S)
	Total	.107(.069S)	.013(.010S)
Moral Intensity (MI)	Direct	.292***(.283M)	.106*(.124M)
	Indirect	Nil	MI-AT-IN: .035*(.041S)
	Total	.292***(.283M)	.141*(.165M)
Neuroticism (NU)	Direct	Nil	.071*(.094S)
	Indirect	Nil	Nil
	Total	Nil	.071*(.094S)
Agreeableness (AG)	Direct	Nil	.161*(.195M)
	Indirect	Nil	Nil
	Total	Nil	.161*(.195M)

Table 7 Analysis of the final model (Continued)

Variable	Effect	Intervening Variable	Dependent Variable
		Attitude (AT)	Intention (IN)
Openness (OP)	Direct	Nil	.234***(.172M)
	Indirect	Nil	Nil
	Total	Nil	.234***(.172M)
Perceived Behavioral Control (PBC)	Direct	Nil	.106**(.164M)
	Indirect	Nil	Nil
	Total	Nil	.106**(.164M)
Attitude (AT)	Direct	Nil	.120*(.145M)
	Indirect	Nil	Nil
	Total	Nil	.120*(.145M)

Discussion of the Findings

Characteristics of the Respondents

The characteristics of the respondents identified them as sufficiently qualified, experienced, and mature to be able to provide answers to the issues raised about software piracy in the questionnaire. The comparison between males and females showed that males were older than females and had more work experience than females. In the context of software piracy males perceived that they are in control of their ethical behavior to a greater extent than females. Females consider the moral intensity associated with software piracy to be significantly stronger than the males. Otherwise, the study found no significant differences due to gender among the mean values of: personality traits (Extraversion, Agreeableness, Conscientiousness, Neuroticism, and Openness); Social Norms; Punishment Certainty; Punishment Severity; and especially a respondent's Attitude to software piracy. Thus, the variable Gender was removed from the theoretical model and the research hypothesis (H14) that *Gender has a significant direct effect on Attitude* was not supported.

Interpretation of Causal Effects

Table 8 presents the effects in the final model based on the total effects shown in Table 7.

Table 8 Summary of Effects in the Final Model

Variable	Intervening Variable	Dependent Variable
	Attitude	Intention
Punishment Severity	Nil	Medium, only direct
Punishment Certainty	Small, only direct	Small, only indirect
Social Norms	Medium, only direct	Small, only indirect
Conscientiousness	Small, only direct	Small, only indirect
Moral Intensity	Medium, only direct	Medium, mainly direct
Neuroticism	Nil	Small, only direct
Agreeableness	Nil	Medium, only direct
Openness	Nil	Medium, only direct
Perceived Behavioral Control	Nil	Medium, only direct
Attitude	Nil	Medium, only direct

The model included a single dependent variable *Intention* which refers to the individual's willingness to continue to display ethical behavior with respect to software piracy. Five out of the nine exogenous variables and the single intervening variable (Attitude) have positive direct medium effects on Intention. The largest effect on Intention is due to Agreeableness (i.e. the extent to which individuals are courteous, kind, flexible, trusting, and forgiving) followed in decreasing order of importance by: **(a)** Openness (i.e. the propensity of individuals to display imagination, curiosity, originality, and open-mindedness); **(b)** Perceived Behavioral Control (i.e. the perceived ease in achieving the behavior in question); **(c)** Moral Intensity (i.e. the characteristics of the issue at hand that influence ethical decision making); **(d)** Punishment Severity (i.e. the level of punishment); and **(e)** Attitude (i.e. the degree to which individuals favorably or unfavorably evaluate ethical behavior

that is of interest to them. The other four effects on Intention associated with Neuroticism, Social Norms, Punishment Certainty, and Conscientiousness are mostly indirect and only small in magnitude.

Among the four variables that have effects on Attitude only Social Norms (i.e. rules of behavior that cause an individual to conform whenever they interact with others in the community) and Moral Intensity are important. In particular, apart from having its own important effect on Intention Attitude also acts as important mediator for the important effect of Moral Intensity on Intention.

Among the five personality traits, only Agreeableness and Openness have important effects on Intention. In particular, Neuroticism (i.e. the extent to which individuals experience and display negative affects like anxiety, sadness, embarrassment, depression, and guilt) had a significant small direct and surprisingly positive effect on Intention. Previous research found that higher levels of deviant behavior are significantly negatively associated with ethical intentions (Peterson, 2002). Also, Conscientiousness has a significant positive indirect small effect on Intention through the intervening variable Attitude. These new findings related to personality traits are discussed further below in new finding section.

Comparison of the Findings with Those from Previous Studies

There were sixteen hypotheses (Table 2) associated with direct effects in the theoretical model. Tables 9(a), (b), and (c) summarize the hypotheses that were fully supported, partially supported, or not supported, respectively.

Table 9 (a) Hypotheses Supported by the Findings

Hypothesis Fully Supported	Reference
H1 Attitude has a significant positive direct effect on Ethical Intention	Aleassa et al. (2012)
H2 Perceived Behavioral Control has a significant positive direct effect on Ethical Intention	Riemenschneider (2011)
H4 Moral Intensity has a significant positive direct effect on Ethical Intention	Wu and Yang (2009)
H6 Punishment Severity has a significant positive direct effect on Ethical Intention	Chaterjee (2008)
H7 Openness has a significant positive direct effect on Ethical Intention	Wooldridge (2012)
H10 Agreeableness has a significant positive direct effect on Ethical Intention	Wooldridge (2012)
H12 Social Norm has a significant positive direct effect on Attitude	Aleassa et al. (2006)
H13 Moral Intensity has a significant positive direct effect on Attitude	Chaterjee (2008)

The hypotheses supported by the findings in Table 9(a) confirm the importance of the direct effect of: (a) Attitude, Perceived Behavioral Control, Moral Intensity, Punishment Severity, Openness, Agreeableness, and Social Norm on Intention. In particular, the variables Attitude, Intention, and Perceived Behavioral Control are well documented features of the Theory of Planned behavior (TPB) which was influential in the formulation of the theoretical model in this study.

Table 9 (b) Hypotheses Partially Supported by the Findings

Hypothesis Partially Supported	Reference
H15 Punishment Certainty has a significant positive direct effect on Attitude	Peace et al. (2003)
H16 Punishment Severity has a significant positive direct effect on Attitude	Peace et al. (2003)

Although these hypotheses of significant positive direct causal effects in Table 9(b) are not supported in the final model in each case there is a

significant positive correlation between the two variables referred to in the hypotheses (Appendix Table A6). This is considered to provide partial support for a significant relationship between the variables and indicates that further studies should reconsider these direct causal relationships.

Table 9 (c) Hypotheses Not Supported by the Findings

Hypothesis Not Supported	Reference
H3 Social Norm has a significant positive direct effect on Ethical Intention	Aleassa et al. (2012)
H5 Punishment Certainty has a significant positive direct effect on Ethical Intention	Chaterjee (2008)
H8 Conscientiousness has a significant positive direct effect on Ethical Intention	Wooldridge (2012)
H9 Extraversion has a significant positive direct effect on Ethical Intention	Wooldridge (2012)
H11 Neuroticism has a significant negative direct effect on Ethical Intention.	Wooldridge (2012)
H14 Gender has a significant direct effect on Attitude	Al-Rafee et al. (2006)

In particular, it is noted in Table 9(c) that there was no partial or full support for the hypothesis that Neuroticism has a significant negative direct effect on Intention. Instead, the finding was that Neuroticism has a small significant positive effect on Intention.

Considering the fully or partially supported hypotheses in Table 9(a) and Table 9(b) there is a reasonable amount of support for the relationships between variables specified in the previous studies by: Aleassa et al. (2002), Riemenschneider (2011), Wu and Yang (2009), Chaterjee (2008), Wooldridge (2012), Peace et al. (2003), and Costa and McCrae (1992), which were the basis of the formulation of the theoretical model used in this study.

New Findings

Table 10 summarizes findings which have not been reported in previous studies.

Table 10 Summary of New Findings

Five New Findings	
1.	Social Norm has a significant positive indirect small effect on Intention through the intervening variable Attitude.
2.	Conscientiousness has a significant positive indirect small effect on Intention through the intervening variable Attitude.
2.	Neuroticism has a significant positive direct small effect on Intention.
3.	Gender does not have any statistically significant effect on Attitude.
4.	Gender does not have any statistically significant effect on Intention.

As stated in Table 10, most of the findings were associated with small, positive, and indirect effects even though they were statistically significant. This means that they may be difficult to detect in practice. However, they do present issues for further exploration in subsequent studies and the strength of these relationships may vary in different contexts.

Social Norm has only a small indirect effect on Intention (via Attitude). A previous study by Aleassa et al. (2012) found a direct effect of Social Norm on Intention. From this finding it is seen that social expectations regarding ethical behavior related to software piracy operate to produce ethical intentions not directly but primarily by affecting attitude toward this behavior with a subsequent effect on intentional. This relates to the observation that an individual's expressed attitude to software piracy may be socially acceptable and in accordance with social expectations (norms) but their intentions may be quite different.

Conscientiousness does not have a direct effect on Intention but only a small indirect effect via Attitude. A previous study by Wooldridge (2012) also found no direct effect of Conscientiousness on Intention but did not report on the indirect effect via Attitude.

Neuroticism is often viewed as a negative characteristic. Previous research found Neuroticism to be negatively associated with Intention among

accounting students (Wooldridge, 2012). However, this study found a significant positive but small effect of Neuroticism on Intention. Does this mean that there is something positive rather than negative about Neuroticism? Neuroticism refers to the extent to which individuals experience and display negative affects like anxiety, sadness, embarrassment, depression, and guilt. Characteristics of Neuroticism such as anxiety, embarrassment, and guilt appear to have a small positive effect on Intention. It is suggested that as the level of neuroticism increases individuals are likely to have stronger feelings of anxiety, embarrassment, and guilt about engaging in software piracy and this strengthens their intention not to be engaged in this behavior.

Gender does not significantly affect Intention toward software piracy among IT professionals in Thailand. This might be because Thai culture is classified as one where there are very few differences between males and females especially in relation to acceptable social behaviors. In this study the distribution of work positions for males and females are quite similar and t-tests and correlations found no significant relationships between Gender and most of variables in the study. In particular, Gender was removed from the theoretical model because it does not have a significant effect on Attitude as hypothesized.

Conclusion

The study aimed to develop theoretical knowledge with practical implications about factors that influence software piracy among IT Professionals in Thailand. The theoretical contribution has been discussed in detail in the preceding section and it may be concluded that the findings were largely consistent with the findings of previous studies with some new findings presented in Table 10.

The practical implications of the findings are explained in the following Table 11 where the findings have been deconstructed into a hierarchy of practical objectives each with an associated hierarchy of actions arranged in decreasing order of their likely effect on the achievement of the objective.

Table 11 Practical Objectives and Actions to Reduce Software Piracy

Objectives	Hierarchy of Actions	Associated Model Construct
1. (Primary Objective) Increase Ethical Intentions toward software piracy	1.1 Recognized the role of the personality trait of Agreeableness.	Agreeableness
	1.2 Recognized the role of the personality trait of Openness.	Openness
	1.3 Develop activities to encourage IT professionals to exercise self control.	Perceived Behavioral Control
	1.4 Increase awareness of the impact of issues related to the moral intensity of software piracy behavior.	Moral Intensity
	1.5 Increase the severity of penalties for software piracy at an individual level.	Punishment Severity
	1.6 Develop positive attitudes to software piracy (see Secondary Objective).	Attitude
2. (Secondary Objective) Improve Attitude toward software piracy	2.1 Emphasize the belief that soft ware piracy is not socially acceptable.	Social Norms
	2.2 Increase awareness of the impact of issues related to the moral intensity of software piracy behavior.	Moral Intensity

Some Suggested Means of Executing Actions

1. Giving rewards for persons who report software piracy in organizations.
2. Increase individual penalties for committing software piracy within organizations
3. Ensure that laws and regulations are in tune with penalties for software piracy.
4. Ensure that resources and manpower are adequate to police software piracy laws and regulations.
5. Incorporate software piracy topics and requirements in the rules, regulations, and codes of conduct for membership in IT Professional Association and in organizations employing IT professionals.
6. Create campaigns and training and education programs to increase individual awareness of the negative aspects related to software piracy.
7. Within organizations and elsewhere develop rewards and positive recognition for individual ethical behavior related to software use.
8. Use real world case studies to show the impacts of software piracy on individuals and the whole society.
7. Emphasize among IT professionals with higher levels of Neuroticism that software piracy causes stress and feelings of guilt.
10. Choose IT professionals who demonstrate high levels of Openness and Agreeableness as individuals who can influence others not to engage in software piracy.

The information in Table 11 offers important practical information for individual IT professional and others on the range of actions that need attention in order to reduce software piracy among IT Professional in Thailand.

This research appears to be the first conducted in the context of IT professionals in Thailand. It is strongly recommended that the study be repeated in order to verify the external validity of the findings especially the new findings in Table 10 need verification. There are limitations on the findings from this study and these should be taken into account for future studies. A number of indicators associated with latent variables were deleted from the measurement model for the study and these indicators need to be tested again in future studies. The study does not include all possible factors for explaining ethical intentions so future studies may include additional constructs. This study was focused on software piracy in relation to the use of software for personal use by IT professionals. The issue of software piracy in organizations has not been addressed here but may be dealt with in future studies. The belief that software piracy affects only rich companies and not individual persons needs to be examined carefully as does the relationship between an individual's intentions and their actual ethical behavior. It is possible that individuals with good intentions may behave differently in practice because of other factors not included in this study.

Despite the limitations it is argued that the study has been successful in examining causes for ethical intentions towards piracy related to the personal use of software among IT professionals in Thailand.

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