# Research-in-Progress: Determinants of Software Piracy Behavior in Saudi Arabia

Jaffar Ahmad Alalwan

*Abstract*—Software piracy is a crime that the legislative authority in many countries tries to avoid by enforcing different types of penalties. Although, the problem of software piracy has received considerable academic consideration, limited concern is given to analyzing the software piracy by criminological theories in developing countries. Criminological theories are more consistent with software piracy in order to understand and prevent such illegal behavior. The objective of this paper is to fill this gap by looking at the software piracy in Saudi Arabia through the lens of contamination theory.

*Index Terms*—Software piracy, containment theory, theory of planned behavior.

## I. INTRODUCTION

Software piracy is considered one of the worst problems intimidating the software industry [1]. Although there are many enforcement and legislative mechanisms to fight software piracy, statistics show that software copyright infringement is increasing, and software industry lost billions of dollars because of software piracy. There are many technical efforts to prevent software piracy, but studies report that these technical efforts have limited success [1], [2]. For example, the percentage of stolen programs installed in personal computers goes from 33% in 2000, which costs $11.75 billion, to 40% in 2009, which costs $51 billion [3]. Also, estimates show that software piracy costs $59 billion in 2010 which is doubled the piracy costs in 2003[4]. In another example from Saudi Arabia, software piracy was 51% in 2011, higher than the global average of 42% [5]. Also, the commercial value of unlicensed software in Saudi Arabia was $449 million (ibid).

Without any doubt, the software piracy is a crime that the legislative authority in many countries tries to avoid by enforcing different types of penalties. For instance, the US Senate Bill imposes copyright breaching penalties including fines of as much as $25,000, and jail terms up to five years [4]. Therefore, criminological theories are more consistent with software piracy in order to understand and prevent such illegal behavior. These theories have been applied in different domains to understand the complicated criminal behavior. Although, the problem of software piracy has received considerable academic consideration, limited concern is given to analyzing the software piracy by criminological theories in developing countries.

Manuscript received January 15, 2015; revised May 12, 2015.
Jaffar Ahmad Alalwan is with the Institute of Public Administration, Dammam, Saudi Arabia (e-mail: alwanj1@gmail.com).

The objective of this paper is to fill this gap by looking at the software piracy in Saudi Arabia through the lens of contamination theory. Achieving this objective contributes to research as well as to practice. A theoretical model based on the containment theory will be added to the software piracy body of knowledge. Determining the determinants of software piracy based on the containment theory will be useful in understanding the behavior of software pirates for both practitioners and policymakers in Saudi Arabia. The rest of this paper is organized in three sections. In Section II, the related literature is reviewed. Then the theoretical background and the proposed model are presented in Section III. Finally, the research methodology is discussed briefly in Section IV.

## II. RELATED LITERATURE REVIEW

The theory of planned behavior (TPB) and the theory of reasoned action (TRA) are widely used in software piracy domain. Chang [6] compared between TRA and TPB; he found that TPB is better than TRA in determining unethical behavior. Based on TRA, Seale *et al*. [7] found that the major predictors of software piracy are attitudes and social norms. Lending and Slaughter [8] adopted TPB and Hofstede's theory of cultures, and found that technical students were more prone to copy software than business students. More recently, Moores *et al*. [9] used TPB and found significant influence of legislative and educational outreach programs on the level of software piracy. Although TRA and TPB are dominant in the software piracy literature, it is argued that general behavior theory, such as TPB and TRA, needs additional improvement to be able to explain the behavior of software piracy [10].

Other researchers use ethical decision theories in order to explain the problem of software piracy. Leonard and Cronan [11] adopted Banerjee's IT ethics model, and found that the intention to behave unethically was connected to an individual's moral belief and attitude towards software piracy, ego strength and gender. Limayem *et al*. [12] used Triandis' model; facilitating conditions and habits were found to have a significant impact on the actual behavior of software piracy; perceived consequences and social factors were found to have a significant impact on the intention to software piracy. Based on the ethical decision-making, Moores and Chang [13] found that buying affects the use; intention affected buying behavior; moral judgment influenced moral intention. More recently, Chan and Lai [14] investigated the Chinese computer users' ethical ideology and its relationship to attitude and behavior toward software piracy; they found that computer users could

be divided into four ethical ideology types, namely, situationists, absolutists, subjectivists, and exceptionists. Willison and Siponen [15] proposed a criminological perspective for software piracy based on two theories: Techniques of Neutralization and Differential Association Theory. On the other hand, there are several researchers who argued that software piracy is ethically right and nothing wrong with it [15]-[19].

The existing literature of software piracy provides essential insights to understand the domain; however, exploring software piracy in developing nations by criminological theories is rare. Therefore, the current paper will cover that gap by adopting the containment theory to clarify an important perspective to the software piracy domain in Saudi Arabia.

## III. THEORETICAL BACKGROUND

As one of the theories that are highly related to the world of reality (Dodder and Long, 1980), the criminology containment theory [20], [21] is one of the popular theories in criminology literature. Reckless (ibid) argues that all humans are subject to criminal behavior, but containment concepts can isolate people from criminal influence. Core concepts of containment theory are outer containment and inner containment. Outer containment is the ability of the society to keep the individual respects the society's values and norms. Outer containment consists of three aspects: internalization of rules, meaningful roles, and group reinforcement.

Internalization of rules is an important concept among psychologists. For example, Frued calls the development of the internalization of rules the superego development (2000). Internalization of rules means that the society encourages individuals to internalize the accepted rules to control the individuals' behaviors. It is a self-regulation dimension that can regulate individuals' behavior to adapt to the society's appropriate behavior. Therefore, we propose:

H1: Positive internalization of rules is negatively associated with the intention to software piracy

The second outer aspect is to provide the individuals with meaningful roles that can protect individuals from establishing their own rules. Having meaningful roles in society can be considered one of the most protective factors that prevents social problems [22]. The meaningful roles played by individuals act as an effective shield that prevents crime in the community [23]. Thus, we propose:

H2: Having meaningful roles is negatively associated with the intention to software piracy

The third aspect of the outer containment is the group reinforcement, which makes individuals have supportive relations by the group. Based on this relationship, individuals are more likely to conform to the society rules. Group-based intervention is considered a social force that induces the improvement of self-regulatory abilities [24]. To support the influence of group reinforcement on individuals' behaviors, Akers [25] states that "The probability that persons will engage in criminal behavior is increased and the probability of their conforming to the norm is decreased when they

differentially associate with others who commit criminal behavior and espouse definitions favorable to it, are relatively more exposed in-person or symbolically to salient criminal/deviant models, define it as desirable or justified in a situation discriminative for the behavior, and have received in the past and anticipate in the current or future situation relatively greater than punishment for the behavior" (p. 50). Therefore, we suggest:

H3: Positive group reinforcement is negatively associated with the intention to software piracy

On the other hand, inner containment can be defined by the individuals' moral nature and ego. Inner containment is considered more effective in controlling individuals' behavior as societies change to be more impersonal and diverse. Inner containment consists of the following four aspects: self-concept, goal orientation, frustration tolerance, and retention norms. The first aspect is a favorable self-concept, which means that a person who perceived himself to be good (i.e. honest, reliable), he is most likely to behave in that way. Self-concept can be defined as "the organization of roles, self-attitudes, personal attributes, and or objects by the actor into a coherent, stable view of himself" (Hepburn, 1977, p. 236). Empirical research suggests that self-concept has an effect on delinquency. For example, Wilson *et al.* [26] found that teens with more positive self-concept are less likely to report delinquency. Young adults who commit crimes have lower self-concept than those who did not commit crimes [27]. So, we suggest:

H4: Positive self-concept is negatively associated with the intention to software piracy

The second aspect of the inner containment is goal orientation, which refers to focusing on achieving accepted long-term goals that helps individuals stay within the society's accepted rules. In an Australian study that includes 260 students, Carroll *et al.* [28] find that non-delinquency is associated to interpersonal and educational goals, while delinquency is more associated to social image goals. In another study that includes 234 Caucasian American students, Skorikov and Vondracek [29] conclude that there is a significant relationship between higher future career orientation and lower problem behavior such as delinquency. Thus, we hypothesize the following:

H5: Positive goal orientation is negatively associated with the intention to software piracy

Frustration tolerance is the third aspect of the inner containment. Frustration tolerance means that individuals, who can withstand disappointments and pressure, are more likely to avoid illegal behavior. In a study that investigates the variables linked to the recidivism in young people, Contreras *et al.* [30] find that low tolerance to frustration is linked to recidivism. Monahan *et al.* (2009) has verified the relationship between criminal behavior and low tolerance to frustration. Therefore, we suggest the following hypotheses:

H6: high tolerance to frustration is negatively associated with the intention to software piracy

The last aspect is retention of norms, which refers to the individuals' commitment to the society norms and values. In a study that has 724 students in Oklahoma, Dodder and Long

(1980) find that retention of norms has a significant relationship with delinquency. Thompson and Dodder [31] confirms the significant relationship between retention of norms and delinquency. So we propose:

H7: Positive retention of norms is negatively associated with the intention to software piracy
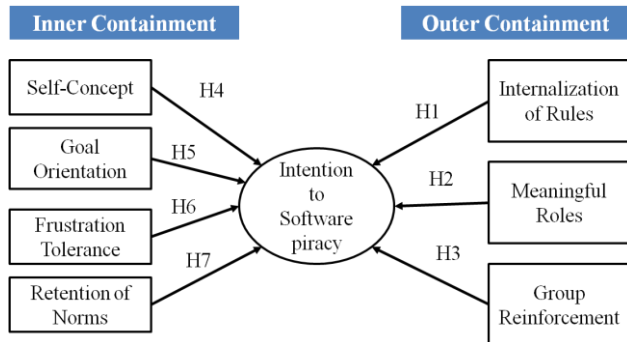


Fig. 1. The research model.

## IV. METHODOLOGY

The measurement of the aforementioned variables will be based on previous studies. The constructs of the inner and outer containment in the research model will be adopted from contamination theory [31], and the construct of the intention to software piracy will be taken from [32]. To validate the proposed model, we plan to conduct a web survey with a group of undergraduate students in Saudi Arabia. We have two reasons for selecting students as the sample of this study. First, previous research has proven that software piracy is more prevalent to students rather than professionals [33]. Second, many previous studies of software piracy (i.e. [34], [35]) have chosen students as the study subjects.

The proposed research model will be analyzed using PLS structure equation modeling tool, which evaluates the psychometric properties of measurement model, and estimate the parameters of structural model. Specifically, SmartPLS software will be used to analyze the dataset. In addition for being prediction-oriented [36], PLS, rather than covariance-based and parameter-oriented structural equation modeling, is used because PLS is preferred to handle large number of variables and relationships [37].

## REFERENCES

[1] G. L. G. Sanders, "International software piracy: Analysis of key issues and impacts," *Information System Research*, vol. 9, no. 4, pp. 380–397, 1998.

[2] K. R. Conner and R. P. Rumelt, "Software piracy: An analysis of protection strategies," *Management Science*, vol. 3, no. 2, pp. 125–139, February 1991.

[3] Business Software Alliance. (2009). Piracy impact study. [Online]. Available: http://portal.bsa.org/piracyimpact2010/index.html

[4] Business Software Alliance. (2010). Piracy study. [Online]. Available: http://portal.bsa.org/globalpiracy2010/downloads/study_pdf/2010_BSA_Piracy_Study-InBrief.pdf

[5] International Intellectual Property Alliance. (2013). Special 301 report on copyright protection and enforcement. [Online]. Available: http://www.iipa.com/rbc/2013/2013SPEC301SAUDIARABIA.PDF

[6] M. K. Chang, "Predicting unethical behavior: A comparison of the theory of reasoned action and the theory of planned behavior," *Journal of Business Ethics*, vol. 17, pp. 1825–1834,1998.

[7] D. A. Seale, M. Polakowski, and S. Schneider, "It's not really theft!: Personal and workplace ethics that enable software piracy," *Behaviour and Information Technology*, vol. 17, no. 1, pp. 27–40, 1998.

[8] D. Lending and S. A. Slaughter, "Understanding differences in ethical beliefs and behaviors toward software copying: The effects of organization culture," in *Proc. the ACM SIGCPR Conference on Computer Personnel Research*, 1999, pp. 253–260.

[9] T. Moores, A. Nill, and M. Rothenberger, "Knowledge of software piracy as an antecedent to reducing pirating behavior," *Journal of Computer Information Systems*, vol. 50, no. 1, pp. 82–89, 2009.

[10] K. D. Loch and S. Conger, "Evaluating ethical decision making and computer use," *Commun. ACM*, vol. 39, no. 7, pp. 74–83, 1996.

[11] L. N. K. Leonard and T. P. Cronan, "Illegal, inappropriate, and unethical behaviour in an information technology context: A study to explain influences," *Journal of Association for Information Systems*, vol. 1, article 12, 2001.

[12] M. Limayem, M. Khalifa, and W. W. Chin, "Factors motivating software piracy, A longitudinal study," *IEEE Trans. Engrg. Management*, vol. 50, pp. 414–425, 2004.

[13] T. Moores and J. Chang, "Ethical decision making in software piracy: Initial development and test of a four-component model," *MIS Quarterly*, vol. 30, no. 1, pp. 167–180, 2006.

[14] R. Chan and J. Lai, "Does ethical ideology affect software piracy attitude and behaviour? An empirical investigation of computer users in China," *European Journal of Information Systems*, vol. 20, pp. 659–673, 2011.

[15] M. T. Siponen, "The relevance of software rights: An anthology of the divergence of sociopolitical doctrines," *AI & Society*, vol. 15, no. 1-2, pp. 128-148, 2001.

[16] A. Kuflik, "Moral foundations of intellectual property rights," in *Computers, Ethics & Social Values*, D. G. Johnson and H. Nissenbaum Eds., New Jersey, USA: Prentice Hall, pp. 169-180, 1995.

[17] H. Nissenbaum, "Should I copy my neighbor's software?" in *Computers, Ethics & Social Values*, H. Nissenbaum Eds. New Jersey, USA: Prentice Hall, pp. 201-213, 1995.

[18] J. Weckert and D. Adeney, *Computer and Information Ethics*, Westport, Connecticut, London: Greenwood Press, 1997.

[19] D. G. Johnson, *Computer Ethics*, third edition, Upper Saddle River, New Jersey: Prentice Hall, 2001.

[20] W. C. Reckless, "A new theory of delinquency and crime," *Federal Probation*, vol. 25, pp. 42–46,1961.

[21] W. C. Reckless, *The Crime Problem*, 4th Edition, New York: Appleton Century Croft.s, 1967.

[22] K. Conley, "Youth leadership development and peer-led initiatives," Master Thesis, Virginia Commonwealth University, 2009.

[23] National Crime Prevention Council. [Online]. Available: http://www.ncpc.org/training/training-topics/crime-prevention-through-environmental-design-cpted-/benefits-of-cpted.

[24] M. J. Garvers, "Improving maintenance of physical activity tial-pilot," PhD Dissertation, The Ohio State University, 2011.

[25] R. L. Akers, "A social learning theory of crime," in *Criminological Theory: Past to Present*, F. T. Cullen and R. Agnew, Eds. Los Angeles: Roxbury Publishing Company, 1994.

[26] R. Willison and M. Siponen, "Software piracy: Original insights from a criminological perspective," presented at the 41st Annual Hawaii International Conference on System Sciences (HICSS), 2008.

[27] C. M. Murphy, S. Stosny, and T. M. Morrel, "Change in self-esteem and physical aggression during treatment for partner violent men," *Journal of Family Violence*, vol. 20, pp. 201–210, 2005.

[28] A. Carroll, K. Durkin, J. Hattie, and S. Houghton, "Goal setting among adolescents: A comparison of delinquent, at-risk, and not-at-risk youth," *Journal of Educational Psychology*, vol. 89, pp. 441–450, 1997.

[29] V. Skorikov and F. W. Vondracek, "Positive career orientation as an inhibitor of adolescent problem behavior," *Journal of Adolescence*, vol. 30, pp. 131–146, 2007.

[30] L. Contreras, V. Y. Molina, and M. C. Cano, "In search of psychosocial variables linked to the recidivism in young offenders," *The European Journal of Psychology Applied to Legal Context*, vol. 3, pp. 77–88, 2011.

[31] W. E. Thompson and R. A. Dodder, "Juvenile delinquency explained? A test of containment theory," *Youth & Society*, vol. 15, pp. 171–194, 1983.

[32] I. M. Al-Jabri and A. H. Abdul-Gader, "Software copyright infringements: An exploratory study of the effects of individual and peer beliefs," *Omega*, vol. 25, no. 3, pp. 335–344, 1997.

[33] G. S. Taylor and J. P. Shim, "A comparative examination of attitudes toward software piracy among business professors and executives," *Human Relations*, vol. 46, no. 4, pp. 419–433, 1993.

[34] R. B. Kini, A. Rominger, and B. S. Vijayaraman, "An empirical study of software piracy and moral intensity among university students," *Journal of Computer Information System*, vol. 40, no. 3, pp. 62–72, 2000.

[35] T. Moores and G. Dhillon, "Software piracy: A view from Hong Kong," *Commun. ACM*, vol. 43, no. 12, pp. 88–93, 2000.

[36] W. W. Chin, "The partial least squares approach for structural equation modelling," in *Modern Methods for Business Research*, G. A. Marcoulides Ed. Hillsdale: Lawrence Erlbaum Associates, pp. 295–336, 1998.

[37] D. Gefen, "E-commerce: The role of familiarity and trust," *Omega*, vol. 28, no. 6, pp. 725-737, 2000.

**Jaffar Ahmad Alalwan** is an assistant professor at the Institute of Public Administration in the eastern province of Saudi Arabia. He holds a PhD degree from Virginia Commonwealth University in information systems, an MBA degree from the University of Scranton in management information systems and marketing, and a BS degree in business administration from King Abdul Aziz University. Alalwan has published research in many academic journals in the areas of strategic information systems planning, enterprise content management systems, electronic government, and the semantic web.