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Software Piracy Research: A Cross-disciplinary Systematic Review

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Abstract:

Few studies have synthesized accumulated scholarly knowledge on software piracy across the disciplines that study this phenomenon. We contribute to understanding the intellectual and social development on software piracy by performing a cross-disciplinary literature search. We used 17 research questions to address five specific areas of inquiry on software piracy research: 1) what makes up software piracy's intellectual substance?, 2) do theoretical contributions on software piracy suggest a cross-disciplinary research community on the topic?, 3) what changes have occurred in software piracy research across the seven measured periods?, 4) what are the top IS journals' publishing patterns on software piracy research?, and 5) who has contributed to software piracy research? To address these questions, we classified 179 software research studies. We found that: 1) over 50 percent of the studies focused on an individual level of analysis, 2) most papers examined software piracy in North America and Asia Pacific regions, although other regions also have major problems, and 3) the distribution of theoretical and methodological contributions show a pattern of leaning towards positivism. The findings point to several research opportunities including expanding research: 1) at organizational levels with particular emphasis on organizations' role as consumers and or intermediaries, 2) in Latin America and Africa, which are areas with high incidence of software piracy, and 3) on approaches beyond positivism.

Keywords: Software Piracy, Theory, Ontology, Methodology, Systematic Review, Level of Analysis, Banville and Landry's Model, Cross-Discipline.

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1 Introduction

Software piracy originates from the unauthorized copying of a copyrighted computer program (Moores & Dhillon, 2000). Antecedents to software piracy may go back to the mainframe era in the late 50s and 60s when the focus of the computer industry was to sell hardware bundled with software (Grad, 2002; Samuelson, 1993). In those days, it was an accepted practice for computer scientists to share programs (Brandel, 1999; Samuelson, 1993) while expanding their programming knowledge (Harmon, 1999). In 1969, IBM began to unbundle software from mainframe hardware after the U.S. Department of Justice considered bundling to be an unfair selling practice (Ceruzzi, 2003; Grad, 2002). This unbundling of hardware from software marks the transition that provided the basis for the microcomputer software industry to develop and grow (Grad, 2002). Unsurprisingly, with the increasing importance of the software industry and the introduction of personal computers (late 1970s), software piracy emerged as an issue (Ceruzzi, 2003; Craig, Honick, & Burnett, 2005) which has grown into a pervasive and global phenomenon (Bagchi, Kirs, & Cerveny, 2006; Nill & Shultz, 2009). Currently, a technological transition in software delivery is occurring as software stored in desktop machines is shifting to software stored in cloud services. This transition into cloud platforms has prompted suggestions that software piracy will no longer be an issue (Atkinson & Draheim, 2013; Barret, 2011; Saeed & Jaffar-ur-Rehman, 2005; Stuckenberg, Felt, & Loser, 2011), yet piracy remains a serious problem in the cloud because of potential license-compliance infringements (McRoberts, 2013; Reuters, 2014).

The U.S. software industry continues to face piracy challenges. For instance, a report commissioned by the International Chamber of Commerce estimated that the commercial value of digitally distributed pirated software was close to US\$19 billion for the year 2008 (Frontier Economics, 2011). Similarly, the Business Software Alliance reported a 7.8 percent increase in the commercial value of pirated software for 2011, which it estimated at US\$63.4 billion (BSA, 2012).

Data on claimed software piracy, associated losses, and calls to research ethical issues from the information age (Mason, 1986) have motivated scholars in multiple disciplines (e.g., economics, criminology, marketing, ethics, and sociology) (e.g., Andrés & Asongu, 2013; Andrés & Goel, 2012; Banerjee, 2011; Givon, Mahajan, & Muller, 1995; Higgins, Wilson, & Fell, 2005; Kigerl, 2013; Moores & Chang, 2006; Siponen, Vance, & Willison, 2012; Siponen & Vartiainen, 2004) to conduct important work on many aspects of the problem. This wide-ranging research has resulted in a body of literature that is not necessarily unified or integrated (Gergely & Rao, 2013; Holsapple, Iyengar, Jin, & Rao, 2008).

Previous reviews on software piracy research have approached it from a criminal (Holsapple et al., 2008) or ethical viewpoint (Siponen & Vartiainen, 2004) or by examining a specific category of potential pirates (Liang & Yan, 2005). However, these studies, which are specific in their focus, do not attempt to profile the accumulated literature of software piracy across different disciplines. In our search, we found that software piracy research is distributed across journals from different disciplines. This distribution may cause difficulties for researchers who aim to understand the topic for scholarly or industry purposes. Consequently, reviewing and profiling existing research on software piracy across its existing disciplines of research may open an informed discussion among scholars who want to understand the theories, methodologies, level of analysis, and perspectives used. Moreover, it may help guide future research efforts. As such, in this paper, we used 17 research questions to address five specific areas of inquiry namely: (1) “what makes up software piracy’s intellectual substance?”, (2) “do theoretical contributions on software piracy suggest a cross-disciplinary research community on the topic?”, (3) “what changes have occurred in software piracy research across the seven measured periods?”, (4) “what are the top information systems (IS) journals’ publishing patterns on software piracy research?”, and (5) “who has contributed to software piracy research?”.

2 Background

We present a detailed theoretical approach to our review below. First, however, we demonstrate precisely what ethical and legal problems “piracy” refers to in the context of software and business.

2.1 Software Piracy and Intellectual Property Rights

The information age is closely related to intellectual capital, and as such, the development of information technology has brought with it ethical concerns (Mason, 1986). Software piracy is one of the important ethical issues that the information age has helped to create (Straub & Collins, 1990). However, one's

position on software piracy depends in part on how one interprets the virtues of the intellectual property of an intangible asset such as software (McGowan, Stephens, & Gruber, 2007; Vuorinen, 2007).

The literature has suggested four different positions for interpreting intellectual property rights (McGowan et al., 2007). First, the proprietary proponent posits that because intellectual property protection allows an individual or organizational players to profit from their intellectual work, it engenders innovation (McGowan et al., 2007). Second, the open source advocate suggests that the greater good of society is the highest priority and that any anyone should be able to modify software. Furthermore, the open source advocate argues that open source programmers develop software to produce quality code and not profit. However, open source advocate acknowledges the possibility and need for proprietary and open source software to coexist and mix (McGowan et al., 2007). Third, the free software ideologue's beliefs conceptually coincide with open source advocate's beliefs in promoting the greater good for society. Further, free software ideologues emphasize that, by coding software, one can freely express ideas, and developers should be free to use any idea when creating new software. Consequently, free software ideologues consider that intellectual property rights are a disservice to the greater good of society and that they block free access to ideas (McGowan et al., 2007). Fourth, the software anarchist does not believe in intellectual property rights. Accordingly, software anarchists disregard intellectual property rights and support the notion that everyone should satisfy their own interests and be free of any restriction in acquiring software. Cracker and warez groups adhere to software anarchist philosophy as they seek to gain social honor and prestige (McGowan et al., 2007; Vuorinen, 2007).

Although software piracy may have positive facets such as network externalities or shadow diffusion, opportunities to increase market share (Conner & Rumelt, 1991; Slive & Bernhardt, 1998), or possibilities for developing societies to access leading technology (Nill & Shultz, 2009), we regard software piracy as a threat to a producer's motivation to innovate and profit from software development in this research. As a result, we concur with other scholars who view software piracy as a major issue of the information age (Moores & Chang, 2006; Straub, 1990; Straub & Beauclair, 1988). Scholars present this conventional view as the mainstream position (McGowan et al., 2007).

A generic definition of piracy describes it as "the unauthorized use of another's production, invention, or conception especially in infringement of a copyright" (Merriam-Webster, 2013). IS research has presented software piracy as the illegal or unauthorized use of software, illegal duplication of software, unauthorized rental of software, illegal hard disk loading, illegal downloading, illegal distribution, abuse of copyrights, misapplication of licenses, and counterfeiting (Chan & Lai, 2011; Crittenden, Robertson, & Crittenden, 2007; Gan & Koh, 2006; Gopal & Gupta, 2010; Holsing & Yen, 1999; Limayem, Khalifa, & Chin, 2004; Moores & Dhillon, 2000; Peace, Galletta, & Thong, 2003; Pykäläinen, Yang, & Fang, 2009; Simpson, Banerjee, & Simpson, 1994; Straub & Collins, 1990).

A common theme from the different studies is that software piracy violates the copyright holder's intellectual property rights. U.S. legislation supports this position through laws such as the Title 17 of the United States Code, which recompenses and stimulates innovation, the Software Copy Protection Act of 1992, which categorizes software piracy as a felony (Gopal & Gupta, 2010), and the Digital Millennium Copyright Act of 1998, which allows developers to place copy protection measures in digital products to prevent unauthorized copying (Liu, Cheng, Tang, & Eryarsoy, 2011). Thus, in this paper, we define software piracy as any action that exploits software in a way that violates the intellectual property protections granted by law.

2.2 Theoretical Approach for Assessing Literature on Software Piracy Research

To understand software piracy and integrate findings on the topic across the many disparate disciplines that address it, we systematically reviewed the literature on software piracy following Banville and Landry's (1989) theoretical model. This model prescribes that one should view the state of scientific research from a cognitive and social perspective (Zhang & Li, 2005). Previous reviews of specific topics on IS research have followed this model (e.g. Cao, Basoglu, Sheng, & Lowry, 2015; Zhang & Li, 2005; Zhang, Li, Scialdone, & Carey, 2009).

Using Banville and Landry's model (1989), Zhang and Li (2005) indicate that one must consider three important dimensions when evaluating the progression of accumulated research: 1) the topic's intellectual substance such as streams, methods, and level of analysis; 2) the topic's connections to other research disciplines; and 3) the evolution of the first and second dimensions over time.

In reviewing the literature on software piracy, we address Banville and Landry's (1989) proposed dimensions using five general research questions. Then, we divide each research question into more specific sub-questions that we answer via systematically reviewing the literature. Research questions one, two, and three explore the cognitive aspects of software piracy. Research questions four and five investigate social aspects of software piracy and the community of researchers who study this phenomenon. Table 1 presents the general and the specific questions that guide this review.

Table 1. Research Questions

RQ1	What makes up software piracy's intellectual substance?
	RQ 1.1 What types of theoretical contributions have scholars developed? RQ 1.2 What research streams have scholars studied? RQ 1.3 What research methods have scholars used? RQ 1.4 What levels of analysis have scholars used? RQ 1.5 What types of respondents for survey-based methodology research exist? RQ 1.6 Do research papers using students follow Compeau, Marcolin, Kelley, and Higgins' (2012) guidelines, which are designated to address generalizability when using students as respondents? RQ 1.7 From what regions have scholars drawn their primary and secondary data?
RQ2	Do theoretical contributions on software piracy suggest a cross-disciplinary research community on the topic?
	RQ 2.1 What are the contributing research disciplines? RQ 2.2 What are the research disciplines associated with journals publishing on software piracy?
RQ3	What changes have occurred in software piracy research across the seven measured periods?
	RQ 3.1 What publication trends have occurred over the years? RQ 3.2 What changes in research streams have occurred over the years? RQ 3.3 What changes in research methods have occurred over the years?
RQ4	What are the top IS journals' publishing patterns on software piracy research?
	RQ 4.1 What research streams have the top IS journals published? RQ 4.2 What methods do the top IS journals prefer? RQ 4.3 Who have contributed publications to the top IS journals?
RQ5	Who has contributed to software piracy research?
	RQ 5.1 Who are the most prolific authors? RQ 5.2 What are the most prolific institutions housing software piracy researchers?

3 Methodology

We conducted a cross-disciplinary search of the progression in the theoretical journal contributions in IS and other disciplines (e.g., ethics, economics, sociology, and criminology). Given IS's cross-disciplinary dimensions, one can expect that journals from other social sciences have published on software piracy. Also, some scholars have suggested that IS research is diverse in its methodological approach (Vessey, Ramesh, & Glass, 2002) and that a topic has matured when, over time, scholars engage in more empirical research that focuses on explaining and predicting rather than describing (Grover, Lee, Durand, & Durand, 1993; Vessey et al., 2002).

We followed two steps. In the first step, we searched the ABI and EBSCO databases, segregated the set of theoretical contributions, and organized them according to Gregor's (2006) theory types. In the second step, we classified the theoretical contributions according to how they addressed research questions focused on the intellectual and social progression of software piracy research.

3.1 First Step

In step 1, we searched papers that focus primarily on software piracy. We did not include opinions, editorials, or papers that analyze court rulings since we focused on studying peer reviewed theoretical papers whose level of analysis focuses on behavioral or technical aspects as previous analyses of IS

research have done (Glass, Vessey, & Ramesh, 2002; Vessey et al., 2002). We used the keyword phrase “software piracy” in our search in ABI/INFORMS and EBSCO databases. We obtained 938 papers from ABI/INFORMS and 424 papers from EBSCO, which resulted in a set of 1362 papers.

We compared the ABI/INFORMS and EBSCO result sets and found 139 duplicated papers, which we eliminated. As a result, we ended up with a set of 1223 papers to examine. Next, we read the papers and analyzed the content to establish whether the study focused mainly on software piracy. After completing this analysis, we ended up with 179 papers.

Next, we categorized the papers based on the type of theoretical contribution they made. We used an ontological examination based on a taxonomy of five classifications: 1) theories for analysis, 2) theories for explaining, 3) theories for predicting, 4) theories for explaining and predicting, and 5) theories for design and action. (Gregor, 2006). Across this variety of theories, researchers can use different epistemologies and methodologies that support the theoretical inquiry (Fawcett & Downs, 1992; Gregor, 2006). Bélanger and Crossler (2011) in their study of information privacy have previously used this framework. Given the extensive body of research on software piracy and calls to generate a structural view (Holsapple et al., 2008), we followed the theory classification method that Gregor (2006) proposes.

We applied Gregor's (2006) framework to our set of 179 papers. Table 2 presents the definitions adapted for software piracy research.

Table 2. Criteria for Classifying Theory (Adapted from Gregor, 2006)

#	Theory for	Definition
1	Analyzing	Describes what software piracy is. It focuses on analyzing and describing software piracy research. No causal relationships. This category includes taxonomies and instrument development.
2	Explaining	Develops explanations of how, why, when, and where software piracy takes place. Does not provide testable propositions.
3	Predicting	Develops what software piracy is and predicts outcomes. Testable predictions are present though not well-developed causal explanations.
4	Explaining and predicting	Provides well-developed causal explanations on software piracy and also brings testable propositions.
5	Design and action	Designs tools for preventing, detecting, or managing software piracy or a framework to evaluate such tools.

3.2 Second Step

Once we classified what we know on software piracy using Gregor's (2006) ontological framework, we proceeded to the second step. We examined the theoretical contributions to software piracy by systematically examining the streams of research, research methods, research design, unit of analysis, respondent types, and geographical source for primary and secondary data. The classifications we used are frameworks previously employed to understand IS research (Avison, Dwivedi, Fitzgerald, & Powell, 2008; Dwivedi & Kuljis, 2008; Palvia et al., 2004; Palvia, Pinjani, & Sibley, 2007; Weerakkody, Dwivedi, & Irani, 2009).

3.3 Streams of research

Researchers have proposed different classifications of IS research topics (ACM, 2012; Barki, Rivard, & Talbot, 1988, 1993). However, we found that, although comprehensive, these classifications are more suitable for classifying the IS and computing research literatures at a higher level of abstraction than what one needs to classify a specific subject such as software piracy.

Seeking classification frameworks, we reviewed the literature on software piracy. One classification asserts that software piracy studies follow preventive, deterrent, or economic perspectives (Gopal & Gupta, 2010; Gopal & Sanders, 1997, 1998). Preventive measures focus on technical measures that increase the cost of committing software piracy (Gopal & Gupta, 2010). Deterrent measures rely on legislation and education to dissuade potential software pirates because of fear of consequences (Cronin, 2002; Gopal & Gupta, 2010). Economic measures seek to increase the profit of software manufacturers while reducing piracy (Gopal & Gupta, 2010). Another classification proposes that research on software

piracy converges into streams of ethics (Cronin, 2002; Holsapple et al., 2008), information systems, economics, and law (Cronin, 2002; Holsapple et al., 2008).

Gergely and Rao (2013) classify software piracy research into behavioral, protection, economics, and global streams by synthesizing extant IS work (Cronin, 2002; Gopal & Sanders, 1997, 1998; Holsapple et al., 2008). Gergely and Rao (2013) contend that the behavioral stream research investigates characteristics of individuals and external factors influencing software piracy. These scholars also assert that one can classify research on software piracy that follows an ethics perspective under the behavioral stream. The economics stream evaluates the benefits that producers can achieve from software piracy. The global stream investigates cross-national software piracy issues. Finally, the protection stream studies technical measures to address software piracy.

We found Gergely and Rao's (2013) framework comprehensive and best suited to classifying the research streams present in our sample set. However, while performing the classification, we noted the need for a category to classify research papers conducting literature reviews on software piracy. We created this category, which Gergely and Rao's framework does not include, to capture reviews of the literature summarizing and/or synthesizing accumulated knowledge.

3.4 Cross-disciplinarity of Research Outlets

To assess if software piracy has captured scholars' interest across disciplines, we analyzed the selected set of papers using the Australian and New Zealand Standard Research Classification (ANZSRC) coding for research disciplines (Pink & Bascand, 2008).

Under the Australian and New Zealand Standard Research Classification, a field of research (FOR) is a hierarchical structure used to classify research work. Previous IS studies have used this classification (Fielt, Bandara, Miskon, & Gable, 2014; Zhang & Li, 2005; Zhang et al., 2009). We complemented this approach with two scholarly journal classifications that use the Australian and New Zealand Standard Research Classification scheme to establish journals' research discipline: the Australian Business Dean Council journal quality list and the Excellence in Research list for Australia. We used the Australian Business Dean Council journal quality list as our primary source because it focuses on business and social science journals; the Excellence in Research for Australia list played a supplementary role confined to classifying the eighteen journals that the Australian Business Dean Council's data did not include.

The Australian and New Zealand Standard Research Classification FOR codes comprise three segments. The division is the broadest hierarchy (level 1) and it is also referred as the research discipline (Pink & Bascand, 2008). Groups (level 2) and fields (level 3) are the finest level of classification and they are detailed segments of the research discipline (Pink & Bascand, 2008). The Australian Business Dean Council and Excellence in Research for Australia list usually provided only the division and the group segments. The Australian and New Zealand Standard Research Classification had 22 divisions, 157 groups, and 1238 fields. In Table A1, we provide the Internet hyperlink to the Australian Bureau of Statistics, which holds the webpage with further details about the Australian and New Zealand Standard Research Classification framework.

3.5 Research Methods

Next, we classified the papers' methodologies. Reviews of the literature in IS provide examples of frameworks or suggestions about how to perform this classification (Alavi & Carlson, 1992; Avison et al., 2008; Cao et al., 2015; Orlikowski & Baroudi, 1991; Palvia, Mao, Salam, & Soliman, 2003; Palvia et al., 2007; Vessey et al., 2002; Weerakkody et al., 2009). We build on Alavi and Carlson's (1992) framework, which Cao et al. (2015) recently applied to study research on social networks.

First, we structured the methodologies in a hierarchy (Table 3). In the first level, we classified papers as empirical or non-empirical. Empirical papers used primary or secondary data to support their inquiry (quantitative, qualitative, mixed methods) (Alavi & Carlson, 1992). On the other hand, non-empirical papers focused on analysis, arguments, or conceptual studies (Alavi & Carlson, 1992; Avison et al., 2008; Weerakkody et al., 2009). We also found papers with more than one primary research methodology and classified them as multi-method at the first hierarchical level. Some papers were also about prescribing, implementing, or instantiating processes to control software piracy, and we classified them at the first hierarchical level as design science method (Gregor & Hevner, 2013).

Table 3. Research Methods

Non-empirical	Software piracy papers mostly based on conceptual ideas, frameworks, or speculation. These types of studies may include some observations, but they are neither systematic or primary nor the basis of the research		Alavi & Carlson (1992), Cao et al. (2015)	
	Conceptual orientation	Papers that present or suggest frameworks, conceptual models, overviews, or theories proposing explanations	Alavi & Carlson (1992), Cao et al. (2015)	
	Illustration	Practitioner-oriented papers that suggest how and what to address with regards to software piracy issues	Alavi & Carlson (1992)	
	Mathematical model	Papers with analytical (formulas / econometric) or descriptive models that address software piracy; papers which do not use artificial data to test the model	Cao et al. (2015)	
Empirical	Software piracy papers that have used primary or secondary data in quantitative, qualitative, and multi-method research		Weerakkody et al. (2009)	
	Quantitative	Papers that rely on numerical methods to analyze and illustrate relationships		Avison et al. (2008), Chen & Hirschheim (2004)
		Secondary data	Papers that use available data (e.g., accounting, financial reports, published statistics, archival data)	Cao et al. (2015), Palvia et al. (2003)
		Simulation	Papers that test and run a model with artificial data	Cao et al. (2015)
		Software piracy review and analysis	Papers that study and structurally analyze software piracy by reviewing previous intellectual contributions (secondary data); papers which critique previous research and proposes extensions to the topic	Cao et al. (2015), Palvia et al. (2003)
		Survey	Papers that use predefined and structured questionnaires to collect data, usually with no manipulation of variables; papers which use printed or electronic means to collect observations	Cao et al. (2015), Palvia et al. (2003)
	Qualitative	Research papers that rely on description to support the investigation of factors explaining the phenomenon of software piracy		Avison et al. (2008), Chen & Hirschheim (2004)
		Case study	Research that study a single or several cases at an organization over a defined period of time; studies conducted from a positivist or interpretive perspective	Cao et al. (2015), Palvia et al. (2003)
		Content analysis	Research that systematically analyzes texts or notes to identify and codify themes	Palvia et al. (2007)
		Ethnography	Research that develops understanding of software piracy from the perspective of the actors of the phenomena	Harrison & Wells (2000)
		Interview	Research that studies software piracy using information acquired through interviews by questioning respondents directly. Questions which are structured or open-ended	Palvia et al. (2007)
Multimethod	Research studies that use more than one primary research methodology either from the same paradigm (positivist or interpretive) or between paradigms; could be a mix of quant/quant, qual/qual, or qual/quant methods		Mingers & Brocklesby (1997), Venkatesh, Brown, & Bala (2013)	
Design science	Research methodology that generates prescriptive knowledge; investigates socio-technical artifacts that could range from an abstract level definition to a specific instantiation of an artifact		Gregor & Hevner (2013), Gregor & Jones (2007)	

In the second level under empirical research, we grouped papers into quantitative or qualitative papers (Avison et al., 2008; Cao et al., 2015). Quantitative papers used statistical analysis to investigate relations between factors (Avison et al., 2008). Qualitative papers focused on describing and interpreting a phenomenon's factors of interest (Avison et al., 2008). In the non-empirical category, at the second hierarchical level, we included the conceptual orientation to cover studies that present an issue or that perform a theoretical analysis, illustration papers, and papers that propose mathematical models but that do not develop them past the conceptual stage and do not empirically test them (Cao et al., 2015). Table 3 describes each of the research methodologies that we used to classify the set of 179 software piracy papers following (Alavi & Carlson, 1992; Cao et al., 2015). It also defines the third-level classification of research methodology used by empirical studies (e.g., "secondary data", "simulation", etc).

3.6 Level of Analysis

Further, we also classified papers based on the level of analysis they employed, which is important for IS scholars because it refers to a project's object of study (Vessey, Ramesh, & Glass, 2005). This classification considers the social and technical nature of IS research because it includes a behavioral category (e.g., individual, group, organizational, intergroup, and society) and a technical category for level of analysis (e.g., computing element, abstract concept) (Bariff & Ginzberg, 1982; Glass, Ramesh, & Vessey, 2004; Glass et al., 2002). Table 4 describes the different categories in the level of analysis classification framework.

Table 4. Level of Analysis

Category	Unit	Description
Behavioral research	Individual	Includes research studying individuals that use and/or process information with IS.
	Organizational	Includes research of IS phenomena taking place at organizations.
	Inter-organizational	Includes research that explores inter-organizational issues (e.g., EDI).
	Group/team	Includes research investigating the interaction and relations in workgroups.
	Project	Focus on papers that investigate software projects (management or engineering aspects).
	Societal	Examines papers that investigate IS phenomena at a regional, national, international, or societal level not involving an organizational context.
	Profession	Includes studies that are relevant to the IS academic community as contributions for teaching or research.
Technical research	Abstract concept	Includes research focusing on computing concepts (e.g., data models or mathematical functions).
	Computing element	Includes research studying computing procedures, algorithms, or programs.
	Computing System	Includes research that investigate one or more computer systems.

3.7 Survey Subjects and Origin of Empirical Data

We also looked into the type of subjects used for empirical survey research and classified subjects by identifying the type of respondents completing the surveys. Then, we identified what research papers from this set used students as respondents. There is burgeoning debate as to whether or not using students affects the external validity of (and, consequently, the potential to generalize) social research (Compeau, Marcolin, Kelley, & Higgins, 2012). To gauge the studies that used students as respondents, we used the framework that Compeau et al. (2012) suggest. One uses the framework to evaluate IS research and establish whether scholars who use students as respondents provide justification in a way that enhances their study's external validity. Table 5 details the four categories we used to classify survey studies that used students as respondents.

Table 5. Recommendations for Generalizations Using Students Respondents (Compeau et al., 2012)

#	Recommendation	What to look for?
1	Goal of research with respect to generalizations made from using students as respondents should be explicitly and clearly presented.	No generalizations EE,ET,TT,TE generalizations* Other setting generalizations Coverage errors
2	Research's intended population should be explicitly identified.	To what population does the study aim to generalize? Tasks, people, contexts?
3	Clear and specific justification supporting the choice of students as respondents, which may include explaining the similarity between students and the target for generalization in terms of subjects, tasks, and settings	Discussion of: representativeness, sample uniqueness, surrogates or members of the population, coverage errors, additional data collection, nonresponse errors
4	The weaknesses of the research sample should be presented in relation to the study's objectives and characteristics.	Discussion of reservations, doubts, nonresponse errors, and why students are a limitation.
Compeau et al. (2012) provide a fifth recommendation but deem it impractical to classify unless an author(s) does it. * Note: EE (data to description), ET (description to theory), TT (concepts to theory), TE (theory to description) (see Seddon & Scheepers, 2006)		

3.8 Geographical Location

We also investigated the empirical studies' geographical locations. Researchers have determined that software piracy is a global issue (e.g., Husted, 2000; Moores & Chang, 2006) that is pervasive in developing countries (Belleflamme & Peitz, 2010). Nevertheless, most of the studies were conducted in North America, followed by Asia-Pacific. Studies in the latter accounted for the majority of the studies conducted in developing regions (Mishra, Akman, & Yazici, 2007). As a result, we checked empirical studies to find the geographical regions in which their authors collected primary or secondary data. We used the geographical locations listed by the BSA report on software piracy, which uses six different regions covering all geographical locations of the world (Africa/Middle East, Asia-Pacific, Eastern Europe, Latin America, North America, and Western Europe). Given the claim that software piracy is a global issue (Husted, 2000; Moores & Chang, 2006), we deemed it consequential to establish whether or not empirical research has matched the issue's global reach.

3.9 Classification and Coding Reliability

The first and second author classified 10 percent of the papers for the different categories and compared their classifications to ensure their assessments agreed using Cohen's kappa. Our results indicated that, in terms of theory types, the two authors achieved an agreement above 0.80; for the other categories, our agreement ranged from 0.61 to 0.85. These agreement ratings are acceptable since researchers have suggested that, when using Cohen's kappa, a measure from 0.61 to 0.80 indicates substantial agreement between the raters (Landis & Koch, 1977; Viera & Garrett, 2005).

4 Results and Analyses

In this section, we present the results and analyze them. We follow the structure of our research questions in Table 1.

4.1 RQ1. What Makes Up Software Piracy's Intellectual Substance?

4.1.1 RQ 1.1. What Type of Theoretical Contributions have Scholars Developed?

To answer this question, we classified the papers following Gregor's (2006) taxonomy for theories. We found that the largest group was of papers that developed theories for predicting (32.40% of the theoretical contributions) followed by explaining-and-predicting theories (25.14%). We found few design and action theories (3.91%) (Figure 1). The theories for predicting and explaining and predicting together accounted for 57.54 percent of the theoretical contributions. This finding suggests the research community

that has studied software piracy has preferred to conduct empirical studies that predict and predict and explain using a quantitative/positivist approach.

Figure 1. Types of Theoretical Contributions

4.1.2 RQ1.2. What Research Streams have Scholars Studied?

To answer this question, we matched the papers with one of the five categories: behavioral, global, protection, economics, and literature reviews (Gergely & Rao, 2013). In the case where a study fitted into more than one category, we classified it based on its major focus. We addressed discrepancies by inter-rater reliability analysis (see Section 3.9). We found that the behavioral stream accumulated 93 papers (53.6% of total). We found 33, 27, and 23 contributions in the global, protection, and economics categories, respectively. Finally, we found three contributions in the literature review category (Figure 2).

Figure 2. Research Stream Count

The behavioral research stream focuses on people's response towards software piracy. Consequently, behavioral research has explored demographic characteristics, attitudes, intention, and ethical factors that influence individuals' decision to commit software piracy. About 50 percent of the behavioral studies on software piracy focused on its ethical and moral aspects (e.g., Chan & Lai, 2011; Hsieh & Lee, 2012; Logsdon, Thompson, & Reid, 1994; Moores & Chang, 2006; Swinyard, Rinne, & Kau, 1990; Thong & Chee-Sing, 1998). This finding is not surprising since IS scholars have emphasized software piracy as an important ethical issue from the information era (Mason, 1986).

Behavioral studies on ethics suggest that there may be differences across nations. For example, Swinyard et al. (1990) found that, when contrasting American and Singaporeans, Americans were more rule oriented in their moral decision making about software piracy, while Singaporeans were more circumstance oriented. These researchers contend that Asian culture values the idea of sharing as a way to nurture common good (Swinyard et al., 1990). Similarly, Kini, Ramakrishna, and Vijayaraman (2004) found that moral intensity and software piracy seemed to be different between American and Thai students of their studied sample. Further, Simpson et al. (1994) studied softlifting (piracy at the individual level), and they suggest that software piracy may not elicit a perception of an ethical issue. Instead, other factors such as convenience or the challenge of pirating software could be more important factors. Other researchers have analogously found software piracy to elicit low moral intensity (Logsdon et al., 1994).

Tan (2002), in studying software piracy as an ethical decision making phenomenon, found that perceived consequences and moral judgment have an impact on one's decision to commit piracy. These findings are similar to Moores and Chang's (2006) four-step model of morality, which proposes that interpreting software piracy is a moral problem in which one's judgment of the consequences is what influences one's decision to commit piracy. As a result, ethical guidelines that are specific to the context of persons who may face the decision to pirate software should be created and used for training individuals and enforcing actions against piracy (Moores & Chang, 2006; Tan, 2002).

Siponen and Vartiainen (2004) also contribute an important investigation based on Kohlberg's (1969) framework of moral development and indicate that most ethical studies have focused on the early pre-conventional and conventional morality levels, which emphasize punishment. These authors suggest that we need more research to unlock mechanisms associated with post-conventional morality that appeal to rights and standards and one's own moral judgment (Siponen & Vartiainen, 2004). Also, Siponen and Vartiainen (2004) point out that no single approach to a given level of moral development is the solution and that we need a comprehensive approach. In Section 2.1, we show that one's view on software piracy may depend on whether one sees software: 1) as a profitable activity, 2) as a tool whose primary use should benefit the greater good of society, 3) or as a tool that should be used if one needs it, regardless of claims of intellectual property rights (Vuorinen, 2007). A comprehensive approach that mapped the different possible mechanisms of morality to the different stances of pirates towards software piracy would be a valuable contribution that could help to extend both theoretical and practical knowledge on ethics and user behavior toward software piracy.

Other behavioral studies have used demographic factors, behavioral theories, or criminology theories. Research on software piracy using behavioral theories dates back to the early 1990s. For instance, Christensen and Eining (1991) used the theory of reasoned action (Fishbein & Ajzen, 1975) and found that attitudes and subjective norms were associated with the intention to commit software piracy. Taylor and Shim (1993) compared business users' and university professors' attitudes toward software piracy. They found that business users reported less inclination to pirate software than university professors (Taylor & Shim, 1993). However, Taylor and Shim (1993) also acknowledged that there may exist a bias among business users' responses due to social desirability. Using the theory of planned behavior (Ajzen, 1985), Peace et al. (2003) found that attitude, subjective norms, and perceived behavioral control had significant relationships with the intention to commit software piracy. They contend that deterrence factors such as punishment severity, punishment certainty, and economic factors including cost influence the attitude towards software piracy. Moreover, they found that punishment certainty was an antecedent of perceived behavioral control (Peace et al., 2003). The findings about deterrence and cost factors by the previous researchers confirm similar findings in a study involving a sample of students from Hong Kong (Moores & Dhillon, 2000).

In their longitudinal study, Limayem et al. (2004) studied behavioral intention, but, instead of the theory of reasoned action or the theory of planned behavior, they introduced Triandis' (1979) model to explain software piracy behavior. The model considers the influence of habits mediated by affect, perceived consequences, and social factors as antecedents of software piracy intentions and considers habit and facilitating conditions as antecedents of actual piracy behavior (Limayem et al., 2004). The researchers confirmed that the investigated factors predicted intentions of software piracy but that intentions did not predict actual piracy behavior. Furthermore, Limayem et al. (2004) established that habit and facilitating conditions were predictors of actual software piracy behavior. They also found that the Triandis model had similar (and, in some cases, better) explanatory power compared to the theory of reasoned action (Limayem et al., 2004). Higgins (2005) used low self-control theory and social learning theory to study

intention to commit piracy. He found that low self-control was related to software piracy but that social learning theory (associating with software pirates) was a stronger predictor of intention to commit piracy.

Researchers have also used neutralization to study individuals' intention to commit software piracy (Hinduja, 2007; Siponen et al., 2012). However, these studies present different conclusions. Whereas Hinduja (2007) found weak support for neutralization factors such as denial of injury, appeal to higher loyalties, denial of negative intent, and claim of relative acceptability, Siponen et al. (2012) found that "condemning the condemners" and "appealing to higher loyalties" were significant predictors of software piracy. Interestingly, Siponen et al. (2012) also compared deterrence factors with the neutralization factors and found that shame (one of the three deterrence factors) had a larger association with intention to commit piracy than any of the other neutralization factors.

One important study that raises concerns about behavioral studies that use data collected mostly through self-completed surveys posits that not controlling for personal motivations may have distorted findings for software piracy research (Kwan, So, & Tam, 2010). In such cases, one may use the randomized response technique to address bias in self-completed surveys (Nederhof, 1985). However, we are not aware of any study that has applied such a technique to study software piracy research, which could be an opportunity to explore.

The global stream mostly studies piracy at the societal level. Husted (2000) analyzed secondary data and found that gross national product was negatively associated with software piracy. He also tested Hofstede's culture indexes and found that individualism was negatively associated with software piracy. Similarly, Marron and Steel's (2000) findings suggest that developed countries have less software piracy and that cultural factors influence software piracy in that nations with high individualism tend to have lower piracy rates. These researchers also suggest that countries' policies toward protecting intellectual property may reflect economic and cultural conditions. Gopal and Sanders (1998) propose that, to help protect software against piracy, foreign developing firms should partner with local firms so that local governments find an incentive to enact protection policy that is friendly to developers. Another angle on societal level research posits that individuals may assume multiple cultural values because of their affiliations to numerous groups (Srite & Karahanna, 2006; Straub, Loch, Evaristo, & Karahanna, 2002).

The protection stream focuses on protecting software from piracy through legal or technical mechanisms. Papers from the legal perspective have made theoretical contributions examining how one can use different aspects of intellectual property legislation (patents, trade secrets, copyrights) to address software piracy issues (Graham, 1984; Koen & Im, 1997; Malhotra, 1994a). Researchers have built on this knowledge and evaluated how the pirate might behave in the presence of legal rules (e.g., Gopal & Sanders, 1997; Peace et al., 2003). Similarly, the technical focus on protection measures against piracy has sought to find how technical measures may discourage software piracy by making it more difficult (Gopal & Sanders, 1997; Malhotra, 1994b; Maude & Maude, 1984).

Lahiri (2012) examined tolerance of some level of software piracy in the context of network externalities and technical protections. He indicates that, when product life is short and market penetration is anticipated to be fast, network externalities are not the best strategy and that, in those cases, technical protections such as strategic control of software patches for licensed software are advisable. This finding challenges the conventional stand on the ineffectiveness of technical protection measures (Conner & Rumelt, 1991; Gopal & Sanders, 1997) because it suggests a specific context that prefers a technical strategy to deter software piracy. However, in general, scholars agree on the limitations of technical measures to control software piracy because these measures discourage the diffusion of software (Athey & Plotnicki, 1994; Conner & Rumelt, 1991; Gopal & Sanders, 1997) and because scholars have shown that technical measures are not robust and somebody usually finds out how to defeat them (Athey & Plotnicki, 1994).

Economics studies investigating the impact of managing demand through pricing mechanisms, patching strategies, network externalities, or bundling strategies constitute another important research stream. Such studies have found that affordability, cost, and consideration of the geographical context when pricing software are factors that influence users when they consider acquiring software (Gopal & Sanders, 2000; Peace et al., 2003). For instance, Conner and Rumelt (1991) tested a model and suggest that increased piracy protection affects software developers because it diminishes software diffusion through network externalities and, thereby, reduces the likelihood of user base growth. Hence, these authors suggest that software with a high cost to learn, that one can customize, or that supports user interaction motivates the emergence of network externalities that will expand the software's market share (Conner &

Rumelt, 1991). Similarly, Slive and Bernhardt (1998) add that home users' tolerance of software piracy spurs the emergence of network externalities because home users are likely to demand the same software at their workplaces. Slive and Bernhardt (1998) suggest that one can see piracy as providing software with a price of "0" in exchange for network externalities. Moreover, Gopal and Sanders (1997) posit that developers can charge a higher price to compensate losses that software piracy causes. Chiu, Hsieh, and Wang (2008) assert that loyal ("stayers") and "dissatisfied switching customers" are more responsive to a lower pricing strategy. A related subject with pricing is the strategy of using bundling to manage piracy. For instance, Gopal and Gupta (2010) counterintuitively stand against unbundling software as a way to maximize revenue. In contrast, they suggest that producers should unbundle and sell individual software and use price discounts to increase the perception of consumers' surplus because it may drive consumer's motivation to pay for software (Gopal & Gupta, 2010).

The literature on economics and software piracy has opportunities for future research. For example, from the economics literature, we can see that, in the larger domain of digital piracy, researchers have suggested that software intellectual property owners should explore alternative means of payments (indirect appropriation) as a valid strategy to capture the value assigned by the end consumer to the pirated software (Belleflamme & Peitz, 2014). In our review of software piracy, we did not find any research studying indirect appropriation as a strategy to address software piracy.

The literature review research stream comprised three papers (Holsapple et al., 2008; Liang & Yan, 2005; Siponen & Vartiainen, 2004). Each paper uses different approaches to study software piracy. For instance, Siponen and Vartiainen (2004) analyze software piracy studies that have examined the role of ethics and classify them into Kohlberg's (1969) framework of moral development. Their findings indicate that the majority of studies have been conducted at the early stages of moral development (levels 1 and 2) and that future research should explore the higher levels of moral development (levels 3 and 4). Liang and Yan (2005) review empirical studies conducted on students to find key factors that influence their intentions, attitudes, and moral stance on software piracy. They also study the decision making processes students used when considering software piracy issues and present strategies for managing software piracy in the students segment (Liang & Yan, 2005). Holsapple et al. (2008) use a framework that applies rational choice and routine activities theory to categorize software piracy studies from a research perspective that focuses on key aspects of the target (value, inertia, visibility, and access), the guardian (technical and legal solutions), and the likely offender (the pirate). From this analysis, they identify what relationships the studies have or have not addressed analytically or empirically and discuss to what degree the studies' findings agree.

4.1.3 RQ1.3. What Research Methods Have Scholars Used?

We used Alavi and Carlson's (1992) framework and complemented it with work from other IS scholars that have performed classification studies on IS (Cao et al., 2015; Orlikowski & Baroudi, 1991; Palvia et al., 2003; Palvia et al., 2007; Weerakkody et al., 2009). For the first classification level, we found that, of the 179 studies, 78.21 percent were empirical, 16.76 percent were non-empirical, 3.91 percent were design science, and 1.12 percent were multi-method (Table 6).

For the second classification level, we found that quantitative studies accounted for the majority of the studies (134 studies / 74.86%). In quantitative methodologies, at the third hierarchical level, the combination of survey and secondary data studies accounted for 122 studies (68.16%) (Table 6). These findings are in line with other systematic reviews of IS subjects that have consistently found that IS research uses positivist methodologies more than other methods (Cao et al., 2015; Smith, Dinev, & Xu, 2011).

Software piracy research has not used empirical research methods such as qualitative studies (case studies, interviews, ethnographies, content analysis) with much frequency (six studies / 3.35%). Likewise, we found a limited number of non-empirical conceptual studies (11.17%). These finding again suggest a methodological inclination toward positivist research. Vessey et al. (2005) suggests that we need to assess the research methods in IS research to identify potential gaps. Hence, with this review, we develop an inventory of the methods used in software piracy research so that researchers can uncover areas of interest.

Table 6. Research Methods Used in Software Piracy Research

Research methodology	80-84	85-89	90-94	95-99	00-04	05-09	10-14	Total L1	Total L2	Total L3	L1%	L2%	L3%
Non-empirical	1	1	5	4	3	13	3	30			16.76%		
Conceptual orientation & illustration	1	1	4	3	2	7	2		20			11.17%	
Mathematical model			1	1	1	6	1		10			5.59%	
Empirical		2	8	12	30	49	39	140			78.21%		
Qualitative						5	1		6			3.35%	
Case study						1				1			0.56%
Content analysis						3				3			1.68%
Ethnography							1			1			0.56%
Interview						1				1			0.56%
Quantitative		2	8	12	30	44	38		134			74.86%	
Secondary data				3	6	14	13			36			20.11%
Simulation		1			2	1	5			9			5.03%
Survey		1	8	9	21	27	20			86			48.04%
Review					1	2				3			1.68%
Multi-method				1		1		2			1.12%		
Design science	1			1		2	3	7			3.91%		
Total	2	3	13	18	33	65	45	179	170	140	100.00%		

4.1.4 RQ1.4. What Levels of Analysis have Scholars Used?

We also analyzed our set of publications for their recurrent level of analysis using an established framework employed in IS and other computer related disciplines (e.g., Glass et al., 2004; Glass et al., 2002; Vessey et al., 2002, 2005; Zhang & Li, 2005). The framework we used has levels of analysis that acknowledge the interaction of human and technology in the IS phenomena (behavioral category) and the technical aspects of IS (Glass et al., 2002).

In our research, we found studies in six of the ten levels of analysis. Among the behavioral categories for level of analysis, the individual level was the most researched level with 91 contributions followed by the societal level with 47 contributions and the organizational level with 34 (Table 7). Computing element was only level in the technical category that emerged, and it had a count of eight research papers. We classified eleven papers as having multiple levels of analysis and two papers as having no specific level of analysis (the latter of which we classified as "other"). Our findings may explain why scholars looking at this topic have called for more studies at the organizational level to understand the phenomenon where most coercive enforcement of antipiracy regulation occurs (Mishra, Raghu, & Prasad, 2005; Slive & Bernhardt, 1998).

Table 7. Level of Analysis

Category	Level	Count
Behavioral	Individual	91
	Organizational	34
	Group	6
	Intergroup	0
	Societal	47
Technical	Computing element	8
Miscellaneous	Multi-level	11
	Other	2

To find out more details about the potential gap in studies at the organizational level, we complemented Vessey's et al. (2002) framework with a bi-dimensional assessment of the research papers to study software as a product that moves through a distribution channel. Here we conceptualize software as a product that satisfies consumers' needs and, thus, examine software piracy as a phenomenon that impacts software's distribution channel (Grier, 2008).

The marketing discipline literature has suggested that distribution channels adopt different configurations—some simpler, others more elaborate. Distribution channels facilitate the flow of products from producer to consumer. Thus, three groups of individuals or groups are salient: producer, intermediary, and consumer (Dent, 2011; Lamb, Hair, & McDaniel, 2002). Depending on distribution channels' configurations, there may be direct channels between producers and consumers or different configurations of indirect channels that include one or more intermediaries (Dent, 2011; Lamb et al., 2002).

We contend that a unidimensional level of analysis is not enough to understand software piracy because the consumer, the producer, and the intermediary play key roles in the channel that takes software from the producer (developer) to the consumer (user) (Downing, 2010) regardless of the way that the consumer ultimately obtained the software. Thus, we conducted a post hoc analysis with the rationale that scholars perform studies on software piracy not only selecting a level of analysis but also adopting explicitly or implicitly a perspective that matches what actors do in a distribution channel. For this analysis, we identified in each paper both the perspective of distribution channel role (consumer, intermediary, or developer), and the level of analysis studied (individual, organizational, or group)

Papers that emphasize the role of consumers investigate how they view piracy or what makes them participate in it or not. Studies that emphasize the intermediary role investigate individuals, organizations, groups, or intergroups that play a role in matching consumers' needs with software products. Finally, studies that emphasize the developer role present individuals, organizations, groups, or intergroups in the context of a software producer (developer/manufacturer) that seeks to profit from creating software. In our data, we did not have intergroup studies, so Table 8 does not show any result for this level of analysis.

Table 8. Level of Analysis and Role in Distribution Channel

Level of analysis	Theory type	Distribution channel role		
		Consumer	Intermediary	Developer
Individual	Analysis	9		
	Explaining	19		
	Predicting	22		
	Explaining and predicting	36		
Organizational	Analysis	8		6
	Explaining	1		2
	Predicting	3	1	13
Group	Analysis		1	1
	Explaining	2	2	
	Predicting		1	
	Total	100	5	22

Results about papers' level of analysis and role in the distribution channel show that 100 research papers looked at the role of the consumer (Table 8). Of these, 86 had an individual-level analysis and a focus on the consumer role across four different theory types. We found 12 studies with an organizational-level analysis and a focus on the consumer role and two studies with a group-level analysis and a focus on the consumer. We found one study that looked at the intermediary role using an organizational level of analysis. Four more studies looked at the intermediary role using a group level of analysis. Also, we found 21 studies that had an organizational-level analysis and a focus on the developer role and one study that had a group-level analysis and a focus on the developer role. Overall, we found that the role of the customer at the individual level of analysis and the role of the developer at the organizational level has

captured the most interest, whereas the role of organizations as consumers or the role of the intermediary has not received much attention.

We can expect significant researcher interest in the individual level focus on the role of the consumer given piracy's behavioral component and the role that individuals play. However, the low count of organizational-level studies (most of which are analysis/non-empirical papers) lends support to the calls for research that indicate that we need to do more to understand how organizations in their role as consumers avoid or commit piracy (Mishra et al., 2007; Mishra et al., 2005).

At the group level, we found some studies in which groups played a role in software piracy as intermediaries (counterfeiters, crackers), but the number was low (only four studies). We cannot draw a firm conclusion here because we have noticed that discussions of counterfeiters or crackers may involve the larger topic of digital piracy, which may be an area that future literature studies could review.

4.1.5 RQ1.5. What Types of Respondents for Survey-based Methodology Research Exist?

In our systematic review, we identified the type of subjects used in survey studies. We found that most studies that used the survey methodology used students (77.9%) as respondents (Table 9). Some researchers have argued that students match the profile of a potential software pirate, which comprises these studies' main argument for using students as subjects. However, as we show in Section 3.7, researchers have expressed concerns about using students as respondents and their potential negative impacts on a study's generalizability (Compeau et al., 2012; Hughes & Gibson, 1991; King & He, 2005; Sears, 1986). We explored the latter point in the next research question.

Table 9. Subject Type for Surveys

Type	Students	%
Students	67	77.9
General users	9	10.5
Academic Employees	7	8.1
Internet respondents	2	2.3
Industry respondents	1	1.2
Total	86	100%

4.1.6 RQ1.6. Do Research Papers Using Students Follow Compeau et al.'s (2012) that Address Guidelines, which are Designated to Address Generalizability when Using Students as Respondents?

We reviewed studies with students as subjects to determine whether they met Compeau et al.'s (2012) recommendations on the four aspects that one should address to justify using students as respondents. Table 10 summarizes the results.

Compeau et al.'s (2012) first recommendation calls for researchers to explicitly and clearly present their goals with respect to generalizations made about using students as respondents. We found that 85 percent of the studies using students met this recommendation. The second recommendation calls for researchers to explicitly define the intended population to which they seek to generalize findings. We found that 72 percent of the studies using students as respondents explicitly defined the intended population; therefore, most studies met the second recommendation. Further, the third recommendation calls for researchers to clearly and specifically justify why they used students as their sample. We found that 64 percent of the papers provided this clear justification. Finally, the fourth recommendation calls for researchers to explicitly discuss their research sample's limitations as they relate to the research's goals and the sample populations used. We found that only 43 percent of the studies addressed this recommendation.

Table 10. Compeau et al.'s (2012) Recommendations for Generalizations Using Students as Respondents*

Recommendation	Count	%
Goal of research with respect to generalizations made from using students as respondents should be explicitly and clearly presented.	57	85
Research's intended population should be explicitly identified.	48	72
Clear and specific justification supporting the choice of students as respondents, which may include explaining the similarity between students and the target for generalization in terms of subjects, tasks, and settings.	43	64
The weaknesses of the research sample should be presented in relation to the study's objectives and characteristics.	29	43
* Count = 67 studies with students as respondents		

Hence, following Compeau et al. (2012), we suggest that future software piracy research needs to explicitly indicate their samples' potential limitations in relation to generalizability whenever researchers consider that it is suitable to use students as respondents. Future research has an opportunity to elaborate how methodology or sample characteristics could influence the findings, and a chance to propose theory explaining these influences (Compeau et al., 2012).

4.1.7 RQ1.7. From What Regions Have Scholars Drawn Their Primary and Secondary Data?

Since researchers have claimed that software piracy is a global issue (BSA, 2011; Lahiri, 2012; Moores & Chang, 2006), we identified the regions from which the papers drew their primary and/or secondary data. In Table 11, we show that 46 papers (36.8% of total) used data from North America. The table also shows that we found 30 papers (24%) that used data from the Asia-Pacific region. However, we found low (or no) numbers of papers that used data from Central and Eastern Europe, Africa, and Latin America, which sources have claimed to have large software piracy rates of no less than 59 percent (BSA, 2012). In the BSA (2012) report, "piracy rate" is equal to the sum of the percentages of those surveyed who report that they pirate software "rarely", "occasionally", "mostly", or "always".

We also found 31 studies that addressed multiple nations. However, although important in their contributions, most of these studies use BSA's data on software piracy at the national level. We found few individual-level studies in Central and Eastern Europe, Africa, and Latin America. Thus, given BSA's suggestion that software piracy has a high incidence rate in developing countries and that software markets in developing countries are burgeoning (UNCTAD, 2012), one can plausibly say that we need more studies in these geographical areas to accumulate knowledge on how to address software piracy there.

Table 11. Geographical Source for Primary and Secondary Data

Type of data	North America	Asia-Pacific	Western Europe	Central & Eastern Europe	Middle East	Africa	Latin America	Multiple nations
Primary	45	30	3		7	1		3
Secondary	1		1			2	1	31
Total	46	30	4		7	3	1	34
%	36.8	24.0	3.2	0.0	5.6	2.4	0.8	27.2
Count = 125 / (three studies accounted for two regions)								

4.1.8 Summary for RQ1

In terms of the intellectual substance accumulated on software piracy research, we conclude that: 1) theory types that have dominated research on software piracy (namely predicting and explaining-and-predicting theories) reflect the positivist tradition observed in studies of IS phenomena; 2) behavioral streams of research account for many of the studies, given the focus on the behaviors of individuals; 3) related to the first point, quantitative approaches dominate the research methodologies used; 4) as the second point implies, individual-level research is the most studied level of analysis; 5) individual-level studies usually use students as respondents; 6) in general, most studies we analyzed followed the first of Compeau et al.'s (2012) recommendations, but only 43 percent followed the fourth; 7) software piracy

studies have mostly used primary data from North America and the Asia-Pacific, while studies using secondary data had a more even distribution across all geographic regions.

While performing our analysis, we found that few studies attempted to study software piracy at organizations, and that most of these studies adopted the developers' perspective. Thus, we suggest that we need more software piracy studies at the organizational level and especially in the context of the organization as the software consumer. This suggestion is consistent with calls for more software piracy research at the organizational level (Mishra et al., 2007; Mishra et al., 2005), and with industry reports suggesting that organizations are having difficulties managing license compliance and handling complex software delivery environments that may facilitate the growth of software piracy (D&NJ, 2013; Henschen, 2014).

Further, software piracy as an issue with social and technical facets has shown that technical measures to control software piracy are limited in their effectiveness (Athey & Plotnicki, 1994; Conner & Rumelt, 1991) and their effectiveness diminishes swiftly as soon as somebody circumvents them (Henderson, 2009). Consequently, from a perspective acknowledging IS phenomena to have social and technological components (Lee, 2001), there is an opportunity to understand software piracy using qualitative methods or combining quantitative and qualitative methodologies because researchers have suggested that such combinations can bring about a better understanding of IS phenomena (Myers, 1997; Venkatesh et al., 2013).

4.2 RQ2. Do Theoretical Contributions on Software Piracy Suggest a Cross-disciplinary Research Community on the Topic?

4.2.1 RQ2.1. What are the Contributing Fields of Research?

We classified the contributing research journals (97 in total) to determine what research disciplines have studied software piracy. We used the Australian Business Deans Council (ABDC) list of journals to do so. This list uses only two of the tree segments (division and group) suggested by ANZSRC. We found research papers on software piracy in 11 divisions and 20 groups. Table 12 presents our findings.

To find the contributions on software piracy from IS journals and contrast it with other research disciplines, we used the group segment from ANZSRC. As we expected, most contributions on software piracy research are from IS journals (37.43% of total) followed by business and management journals (27.93%), applied economics (8.94%), and criminology (4.47%).

4.2.2 RQ2.2. What are the Research Disciplines Associated with Journals Publishing on Software Piracy?

In Table 13, we present those journals that published two or more of the 179 software piracy papers we identified (Table A1 has complete list). We use the group segment of ANZSRC to establish the research discipline. The top journal, the *Journal of Business Ethics* with 29 publications, belongs to the business and management discipline. In second place, *Communications of the ACM* with nine publications, belongs to the information and communications discipline. In third place, *Information & Management* with eight publications also belongs to the information and communications discipline. In fourth place, *Behavior & Information Technology* with five publications, belongs to the psychology and cognitive sciences discipline.

Given that journals from various disciplines published software piracy research, we examined the data to find authors who published across journals from different research disciplines. Figure 3 presents the authors relative to the number of software piracy papers they have published and the different research fields those papers have appeared in. We found that 23 authors published in outlets from multiple research disciplines such as Information and computing sciences; commerce, management, tourism and services; psychology and cognitive sciences; economics; studies in human society; language communication and culture; and studies in creative arts and writing (six research disciplines).

Figure 3 also shows that six scholars have published in journals from three different research disciplines and that 17 scholars have done so across journals from two different research disciplines. Furthermore, information and computing sciences, commerce, management and tourism, and psychology and cognitive sciences are the top three research disciplines in which multi-discipline scholars have published papers (numbering 16, 15, and 10 papers, respectively). Table A2 lists all the papers (52 in total) from those authors who have published about software piracy in journals from different research disciplines. In

summary, Figure 3 establishes that researchers will often address multiple research disciplines as they study software piracy.

Table 12. Research Discipline by Divisions and Groups

Division	Division description	Group	Group description	Papers in division count	Papers in group count	% of papers in division	% of papers in group
8	Information and computing sciences	803	Computer software	70	1	39.11	0.56
		806	Information systems		67		37.43
		807	Library and information studies		1		0.56
		899	Other information and computing sciences		1		0.56
9	Engineering			2		1.12	
11	Medical and health sciences	1117	Public health and health services	1	1	0.56	0.56
13	Education			4		2.23	
		1302	Curriculum and pedagogy		1		0.56
		1303	Specialist studies in Education		3		1.68
14	Economics			18		10.06	
		1401	Economic theory		1		0.56
		1402	Applied economics		16		8.94
		1499	Other economics		1		0.56
15	Commerce, management, tourism and services	1502	Banking, finance, and investment	60	1	33.52	0.56
		1503	Business and management		50		27.93
		1505	Marketing		7		3.91
		1599	Other commerce, management, tourism, and services		2		1.12
16	Studies in human society			9		5.03	
		1602	Criminology		8		4.47
		1608	Sociology		1		0.56
17	Psychology and cognitive sciences*	1701	Psychology	10	5	5.59	2.79
18	Law and legal studies			3		1.68	
		1801	Law		3		1.68
19	Studies in creative arts and writing			1		0.56	
		1902	Film, television, and digital media		1		0.56
20	Language, communication, and culture			1		0.56	
		2001	Communication and media studies		1		0.56
Total				179	172*		
Note: Australian and New Zealand Standard Research Classification is available from http://www.abs.gov.au/Ausstats/abs@.nsf/Latestproducts/6BB427AB9696C225CA2574180004463E Australian Business Dean Council and Excellence in Research for Australia lists are available from http://lamp.infosys.deakin.edu.au/abdc/ * Two journals with software piracy papers in division 09 and five in division 17 did not have a group segment							

Table 13. Journals with Two or More Contributions

#	Journal	Research discipline	Count
1	<i>Journal of Business Ethics</i>	Business and management	29
2	<i>Communications of the ACM</i>	Information systems	9
3	<i>Information & Management</i>	Information systems	8
4	<i>Behaviour & Information Technology</i>	Psychology and cognitive sciences	5
5	<i>Decision Support Systems</i>	Information systems	4
6	<i>Ethics and Information Technology</i>	Information systems	4
7	<i>Information Systems Research*</i>	Information systems	4

Table 13. Journals with Two or More Contributions

8	<i>Journal of Management Information Systems*</i>	Information systems	4
9	<i>Journal of Systems Management</i>	Information systems	4
10	<i>Applied Economics Letters</i>	Applied economics	3
11	<i>Business Ethics: A European Review</i>	Business and management	3
12	<i>Journal of Computer Information Systems</i>	Information systems	3
13	<i>Management Science</i>	Business and management	3
14	<i>Computers & Security</i>	Information systems	2
15	<i>Economic Inquiry</i>	Applied economics	2
16	<i>Information Management & Computer Security</i>	Information systems	2
17	<i>Information Society</i>	Information systems	2
18	<i>International Review of Law, Computers & Technology</i>	Law	2
19	<i>Journal of Criminal Justice & Popular Culture</i>	Criminology	2
20	<i>Journal of Economic Crime Management</i>	Criminology	2
21	<i>Journal of Educational Computing Research</i>	Specialist studies in education	2
22	<i>Journal of Information Systems</i>	Information systems	2
23	<i>Journal of Organizational Computing & Electronic Commerce</i>	Information systems	2
24	<i>Security Journal</i>	Criminology	2
25	<i>The Journal of Consumer Marketing</i>	Marketing	2
* Journal belongs to AIS Senior Scholars' basket of journals

Figure 3. Authors Publishing Across Journals from Multiple Research Disciplines

4.2.3 Summary for RQ2

Classifying the selected set of journals with the Australian Business Dean Council's journal quality list, we found that they represented a diverse range of disciplines. In summary: 1) most of the journals were IS

journals (37.43%) (which, when combined with the other 'information and computing sciences' division journals, rises to 39.11%); and 2) although IS journals published the most software piracy papers, the combined impact of business and management, marketing, psychology, criminology, economics, finance, sociology, and law accounted for 60.89 percent of the publications. Many contributions have come from other disciplines, which suggests the usefulness of a cross-disciplinary approach to software piracy. Consequently, both new and experienced researchers seeking to contribute to the software piracy discipline may not have to consider only IS journals but also journals from other disciplines when establishing what we know or when considering outlets to publish software piracy research.

4.3 RQ3. What Changes Have Occurred in Software Piracy Research Across the Seven Measured Periods?

4.3.1 RQ3.1. What Publication Trends Have Occurred Over the Years?

Period 10-14 only contains four years because we included papers only up to 2013. We adjusted that period accordingly.
Count = 179

Figure 4. Number of Publications per Period and Yearly Rate / Period

In our systematic review, we analyzed seven five-year periods each. Initial contributions to software piracy emerged in the 1980-1984 period (see Figure 4). After that, in the next five periods, contributions to software piracy research increased (see Figure 4a) and peaked in the 2005-2009 period. In contrast, in the 2010-2014 period, the number of software piracy papers declined. However, the last period only includes four years. Thus, to compensate for the last period with only four years, we calculated the yearly rate of publication per period to more accurately compare the seven studied periods. We calculated the yearly rate of publication by dividing the number of publications per period over the number of years in the period. Figure 4b indicates that, even after normalizing the publication figures, the number of publications declined during the 2010-2014 period.

We also investigated what theory types papers used in each period to determine trends. We used five-year periods beginning in 1980. Figure 5 shows that, during the 1980-1984 period, analyzing and design and action theories each had one research paper. Then, during the 1985-1989 and 1990-1994 periods, explaining, predicting, and explaining-and-predicting theories emerged and grew more prevalent. We found a low number of papers that employed design and action theory, but papers that employed this theory type began increasing in the 2006-2009 period and 2010-2014 period.

Theory type/year captures the pear year rate of a theory type per period. It is calculated by dividing number of publications per theory type over the years for the period. Each period has five years with the exception of the last period that has four years.

Figure 5. Contributions by Theory Type per Period

4.3.2 RQ3.2. What Changes in Research Streams Have Occurred Over the Years?

Figure 6 shows that, overall, the behavioral research stream contributed the most number of papers. The behavioral research stream emerged during the 1990-1994 period and peaked during the 2005-2009 period. After that, the number of papers decreased. The global stream also peaked in the 2005-2009 period. However, the economics research stream has continued increasing since it emerged during the 1985-1989 period. The protection stream shows an irregular pattern. It was stable during the 1980-1984 and 1985-1989 periods, increased throughout the 1990-1994, 1995-1999, and alternated between decreasing and increasing among the 2000-2004, 2005-2009, and 2010-2014 periods. The graph suggests that researchers are aware of the limitations that protection measures have (Athey & Plotnicki, 1994; Conner & Rumelt, 1991) but nevertheless sometimes explore new technical-protection measures as technological measures become available.

Figure 6. Count of Papers' Streams for each Period and Yearly Publication Rate for each Period

4.3.3 RQ3.3. What Changes in Research Methods Have Occurred Over the Years?

First, we present the results for the first classification level (see Table 3 for the classification levels). Empirical and design science papers emerged during the early periods. Design science began in the 1980-1984 period and empirical in the 1985-1989 period. However, only empirical methodology has grown continuously since (Figure 7). Only during the 2010-2014 period did the category slightly decline. For this reason, we checked the publication rate per period for empirical, non-empirical, and design science categories and adjusted the results to account for the four years in the 2010-2014 period (other periods have five years) (Figure 8).

Figure 7. Research Method First Classification Level

Figure 8. Research Method Yearly Rate of Publication per Period

We still found that non-empirical papers reduced in number during the 2010-2014 period, whereas empirical papers remained about the same. However, design science papers' rate per year showed growth for the 2005-2009 and 2010-2014 periods (see Figure 8 for the details).

Second, we present the results for the second classification level (see Table 3 for the classification levels). Of the empirical papers, 74.86 percent were quantitative and 3.35 percent were qualitative. Of the non-empirical papers, 11.17 percent were conceptual and illustrative and 5.59 percent were mathematical models. Figure 9 presents the details. The graph reveals that quantitative categories have tended to grow over time and that other research methodologies do not have a consistent pattern.

Method	80-84	85-89	90-94	95-99	00-04	05-09	10-14	%
Conceptual orientation & illustration	1	1	4	3	2	7	2	11.17%
Mathematical model			1	1	1	6	1	5.59%
Qualitative						5	1	3.35%
Quantitative		2	8	12	30	44	38	74.86%
Total	1	3	13	16	33	62	42	

Percentages are based on n=179

Percentage is less than 100% because there are 9 articles with no level 2 hierarchy.

Figure 9. Second Classification Level

For the third classification level, which applies only to empirical methods (see Table 3 for the classification levels), papers with the survey method accounted for 48.04 percent, whereas secondary data method accounted for 20.11 percent. These two categories combined accounted for 68.16 percent of all contributions. Figure 10 (next page) shows that the two research types consistently have tended to grow over time.

4.3.4 Summary for RQ3

To summarize, we found that: 1) software piracy research began to accumulate during the 1980s; 2) software piracy research reached its peak during the 2005-2009 period, during which 36.31 percent of the total number of these papers were published; 3) most software piracy research appeared in the first 13 years of the 2000s (79.88%); 4) methodologically, empirical, quantitative, survey-based/secondary-data based research has dominated (especially during the 2000-2004, 2005-2009, and 2010-2014 periods); and 5) during the 2010-2014 period, fewer software piracy publications appeared per year (11.25) compared to the 2005-2009 period (13).

At first glance, it would seem that software piracy research has achieved a maturity level, which may explain why fewer such publications have appeared. The publication pattern for the predicting and explaining-and-predicting theories supports this suggestion. Predicting and explaining-and-predicting theories reflect a more mature level that builds on knowledge accumulated from analyzing and explaining theories (Gregor, 2006). Moreover, the large amount of survey-based research conducted during the 2000-2004, 2005-2009, and 2010-2014 periods also indicates software piracy research has matured because scholars are engaging in more empirical research focusing on explaining and predicting rather than describing (Grover et al., 1993; Vessey et al., 2002).

However, we contend that conditions for renewed interest in software piracy research do exist. As we complete the transition to cloud computing, and with the explosion in the availability of mobile devices driving the bring-your-own-device (BYOD) trend at the workplace, we suggest that we need to expand our understanding on how organizations control software piracy. Also, aggressive auditing practices by proprietary software developers (Mackie, 2014; Pender, 2010) open a need and an opportunity to expand our understanding on what organizations can do to avoid software piracy. Thus, studies that address organizational controls that could facilitate compliance with intellectual property rights or that prescribe methodologies that organizations could implement to control software piracy are research opportunities in which one could apply design and action or explaining theories (i.e., case studies).

Figure 10. Third Classification Level

4.4 RQ4. What are the Top IS journals' Publishing Patterns on Software Piracy Research?

4.4.1 RQ4.1. What Research Streams Have the Top IS journals Published?

We also investigated software piracy publications in the IS Senior Scholars' basket of eight journals (AIS, 2011). We found that six out of the eight of journals published research on software piracy. Table 14 shows that only the *Journal of Management Information Systems* and *Information Systems Research* had more than one contribution. The *European Journal of Information Systems*, *MIS Quarterly*, *Journal of Strategic Information Systems*, and *Information Systems Journal* had one contribution each; *Journal of Information Technology* and *Journal of the Association for Information Systems* did not publish research on software piracy. We also found that most of the contributions published in the top-eight journals appeared between 2003-2011 (66.67%), which coincides with our finding that most software piracy research appeared from the year 2000 (see Section 4.3.4).

In addition, we studied the distribution of research streams among the AIS Senior Scholars' basket of journals (see Table 15). Of the 12 papers, seven came from the behavioral stream (58.3%), two from the economic stream, two papers from the protection stream, and one from the literature review stream. protection stream, and 8.3 percent (1 paper) were literature reviews. No journal published a global stream paper.

Table 14. AIS Seniors' Basket of Top Eight Journals

Journal	1997	1998	2003	2004	2006	2008	2009	2010	2011	Total	%
<i>European Journal of Information Systems</i>									1	1	8.3
<i>Information Systems Journal</i>				1						1	8.3
<i>Information Systems Research</i>		1				1	1	1		4	33.3
<i>Journal of Management Information Systems</i>	2	1	1							4	33.3
<i>Journal of Strategic Information Systems</i>							1			1	8.3
<i>MIS Quarterly</i>					1					1	8.3
Total	2	2	1	1	1	1	2	1	1	12	100
<i>Journal of Information Technology</i> and <i>Journal of the Association for Information Systems</i> did not publish any software piracy papers.											

Table 15. AIS Seniors' Basket Research Streams

Stream	Count	% Stream
Behavioral	7	58.3
<i>European Journal of Information Systems</i>	1	
<i>Information Systems Research</i>	2	
<i>Journal of Management Information Systems</i>	3	
<i>MIS Quarterly</i>	1	
Economics	2	16.7
<i>Information Systems Research</i>	2	
Literature Review	1	8.3
<i>Information Systems Journal</i>	1	
Protection	2	16.7
<i>Journal of Management Information Systems</i>	1	
<i>Journal of Strategic Information Systems</i>	1	
Total	12	

4.4.2 RQ4.2. What Methods Do the top IS Journals Prefer?

Overall, Table 16 shows software piracy research in the top IS journals to have a slightly larger preference for empirical methodology when compared to the general set of papers (83.33% vs. 79.33%, respectively). Of the empirical research, 75 percent was quantitative (and, of that 75%, 66.67% was survey research). This profile is similar to the entire data set (i.e., 74.86% of research in the general set was quantitative). However, in the quantitative methodology, the top IS journals presented a stronger preference for survey methodology (66.67% vs. 48.04%, in the complete set of papers). Further, non-empirical research in the top IS journals accounted for only 8.33 percent of the total (one study).

4.4.3 RQ4.3. Who Have Contributed Publications to the Top IS Journals?

We found 28 different researchers who had published software piracy research in six of the eight AIS Senior Scholars' basket of journals (see Table 17). G. L. Sanders and R. D. Gopal were the only authors with more than one paper. These two authors partnered on papers published in *ISR* and *JMIS* in 1997 and 1998, respectively. T. T. Moores, overall the most prolific author on software piracy research, also had one paper in *MIS Quarterly*. On average, contributing authors to AIS Senior Scholars' basket of journals recorded only one contribution.

Table 16. AIS Seniors' Basket Methodologies

Methodology (L1, L2, L3)	L1	L2	L3	Journal count
Empirical	10			
Qualitative		1		
Case study			1	
<i>Journal of Strategic Information Systems</i>				1
Quantitative		9		
Review			1	
<i>Information Systems Journal</i>				1
Survey			8	
<i>European Journal of Information Systems</i>				1
<i>Information Systems Research</i>				2
<i>Journal of Management Information Systems</i>				4
<i>MIS Quarterly</i>				1
Non-empirical	1			
Mathematical model		1		
<i>Information Systems Research</i>				1
Multi-method	1			
<i>Information Systems Research</i>				1
Total				12

Table 17. AIS Senior Scholars' Basket Contributing Authors

#	Author	Year	Journal	Count
1	T. August	2008	<i>Information Systems Research</i>	1
2	O. Burton	2009	<i>Information Systems Research</i>	1
3	C. Jerry Cha-Jan	2006	<i>MIS Quarterly</i>	1
4	R. Y. K. Chan	2011	<i>European Journal of Information Systems</i>	1
5	Y. Chee-Sing	1998	<i>Journal of Management Information Systems</i>	1
6	H. K. Cheng	1997	<i>Journal of Management Information Systems</i>	1
7	T. Fang	2009	<i>Journal of Strategic Information Systems</i>	1
8	D.F. Galleta	2003	<i>Journal of Management Information Systems</i>	1
9	R. D. Gopal	1997	<i>Information Systems Research</i>	1
	R. D. Gopal	1998	<i>Journal of Management Information Systems</i>	1
10	S. S. K. Kwan	2010	<i>Information Systems Research</i>	1
11	J. W. M. Lai	2011	<i>European Journal of Information Systems</i>	1
12	T.T. Moores	2006	<i>MIS Quarterly</i>	1
13	A. G. Peace	2003	<i>Journal of Management Information Systems</i>	1
14	T. Pykäläinen	2009	<i>Journal of Strategic Information Systems</i>	1
15	T. S. Raghu	2009	<i>Information Systems Research</i>	1
16	G.L. Sanders	1997	<i>Information Systems Research</i>	1
	G.L. Sanders	1998	<i>Journal of Management Information Systems</i>	1
17	R. R. Sims	1997	<i>Journal of Management Information Systems</i>	1
18	R. Sinha	2009	<i>Information Systems Research</i>	1

Table 17. AIS Senior Scholars' Basket Contributing Authors

19	M. Siponen	2004	<i>Information Systems Journal</i>	1
20	M. K. P. So	2010	<i>Information Systems Research</i>	1
21	K. Y. Tam	2010	<i>Information Systems Research</i>	1
22	H. Teegen	1997	<i>Journal of Management Information Systems</i>	1
23	J. Y. L. Thong	1998	<i>Journal of Management Information Systems</i>	1
24	J.Y.L. Thong	2003	<i>Journal of Management Information Systems</i>	1
25	T. I. Tunca	2008	<i>Information Systems Research</i>	1
26	T. Vartiainen	2004	<i>Information Systems Journal</i>	1
27	A. Vinze	2009	<i>Information Systems Research</i>	1
28	D. Yang	2009	<i>Journal of Strategic Information Systems</i>	1
Total				30

4.4.4 Summary for RQ4

To summarize, in the AIS Senior Scholars' basket of journals, we found that: 1) 12 were software piracy papers; 2) 75 percent of those studies appeared during the 2000s; 3) behavioral studies represented the majority (58.3%); and 4) R. D. Gopal and G. L. Sanders published the most papers (two each).

Although software piracy research has captured the IS discipline's interest, the number of such papers published in AIS Senior Scholars' basket of journals accounted for only 6.70 percent of them all. Top IS journals have emphasized contributions with strong theory development (Tams & Grover, 2010). However, observing the main theory types published in software piracy, one can see that 58 studies (32.40%) contained theories for predicting. Gregor's (2006) taxonomy on theory types asserts that predicting research focuses on empirically predicting the studied phenomenon and not on the theoretical explanation. This pattern may explain why studies from the global research stream have not appeared in the AIS Senior Scholars' basket of IS journals since they typically use secondary data and focus more on predicting software piracy. On the other hand, top IS journals require a solid theoretical explanation when presenting a predicting study. Further, it appears that only a limited number of publications that develop theory supporting empirical studies and that we classified as explaining-and-predicting theory papers have reached the level of theory development that the AIS Senior Scholars' basket of journals require.

Finally, although we found three publications from the economics research stream in the AIS Senior Scholars' basket of journals, three publications from this research stream appeared in *Management Science* (Conner & Rumelt, 1991; Gopal & Gupta, 2010; Nascimento & Vanhonacker, 1988)—arguably the premiere journal for operations management and related disciplines (Olson, 2005).

4.5 RQ5. Who Has Contributed to Software Piracy Research?

4.5.1 RQ5.1. Who Are the Most Prolific Authors?

A set of 318 authors emerged as contributors to software piracy research for the 179 papers in our review. Table 18 shows the most prolific authors. The table classifies the most prolific authors in terms of their total number of publications, adjusted number, and straight rank (Chua, Cao, Cousins, & Straub, 2002; Romano & Fjermestad, 2001; Zhang & Li, 2005). Normal rank assumes that all authors contribute equally to a research paper; consequently, authors received 1 point per paper with their name listed. Adjusted rank splits the contribution of one paper between its authors. Hence, the fewer a paper's authors, the more the rank system weights each author's contribution. Subsequently, straight rank considers the first author as a paper's key contributor, and, for this reason, straight rank counts only the first author as the paper's contributor. Further, since the literature suggests different ways to measure authors' contributions, we list these three different measures as other IS reviews have used (e.g., Chua et al., 2002; Zhang & Li, 2005). Regardless of the measure used (normal, adjusted or straight), T.T. Moores was the most prolific author on software piracy research. G. E. Higgins and R. D. Gopal were second and third, respectively. Table 18 has more details.

Table 18. Prolific Authors

Normal rank	Author	Normal number	Adjusted rank	Author	Adjusted number	Straight rank	Author	Straight number
1	T.T. Moores	8	1	T.T. Moores	5.33	1	T. T. Moores	8
2	G. E. Higgins	6	2	S. Hinduja	4	2	G. E. Higgins	6
3*	R. D. Gopal	5	3	G. E. Higgins	3.83	3*	R. D. Gopal	4
3*	G. L. Sanders	5	4	E. K. W. Lau	3	3*	S. Hinduja	4
4*	S. Goode	4	5	S. Goode	2.5	4*	A. R. Andres	3
4*	S. Hinduja	4	6	D. S. Banerjee	2.33	4*	D. S. Banerjee	3
5*	B. S. Vijayaraman	3	7	R. D. Gopal	2.25	4*	E. K. W. Lau	3
5*	A. Nill	3	8	G. L. Sanders	2.25	4*	S. Goode	3
5*	A. R. Andres	3	9*	A. R. Andres	2			
5*	C. J. Robertson	3	9*	Y. Malhotra	2			
5*	D. Yang	3						
5*	D. S. Banerjee	3						
5*	E. K. W. Lau	3						
5*	H. K. Cheng	3						
5*	V. Mahajan	3						
5*	W. F. Crittenden	3						
5*	R. B. Kini	3						
5*	J. H. Im	3						
5*	A. Prasad	3						
5*	H. V. Ramakrishna	3						
5*	I. Akman	3						

* Tied rank

4.5.2 RQ5.2. What Are the Most Prolific Institutions Housing Software Piracy Researchers?

Contributors to software piracy research were associated with 192 institutions. We again used the normal, adjusted, and straight ranks. In Table 19 (next page), we see that, regardless of the analysis used, University of Nevada, Las Vegas was the top institutional home for contributing researchers. In second place (also as measured by the three different ranks) was the University of Louisville. In third place was Hong Kong University of Science and Technology (normal and straight count) and Australian National University (adjusted and straight count).

4.5.3 Summary for RQ5

Regardless of the ranking system, T. T. Moores emerged as the most prolific contributor to software piracy research. This author has published not only in IS journals but also in business and management outlets. The next top-two contributing scholars followed the same pattern: Higgins has published in journals from criminology, sociology, and psychology, and Hinduja has published in criminology and psychology journals.

Moreover, two American universities appeared at the top places for software piracy research. However, this finding does not mean that software piracy research has not attracted the interest of universities at other places. In third and fourth position, we can see that universities from Australia and Hong Kong appear as important contributors to software piracy research.

In summary, given the interest generated that software piracy has generated, both new and experienced researchers are not necessarily limited to publishing in IS journals when publishing on software piracy. Opportunities to publish in journal outlets in other disciplines are open because 109 out of the 179 publications on software piracy in this study appeared in journals outside IS.

Table 19. Prolific Institutions

Normal rank	Organization	Normal number	Adj. rank	Institution	Adj. number	Straight rank	Institute§	Straight c
1	U. of Nevada, Las Vegas	14	1	U. of Nevada, Las Vegas	7.67	1	U. of Nevada, Las Vegas	9
2	U. of Louisville	11	2	U. of Louisville	6.00	2	U. of Louisville	6
3	Hong Kong U. of Science and Technology	9	3	Australian Nat. U.	4.00	3*	Australian Nat. U.	4
4*	Australian National U.	7	4	Hong Kong U. of Science and Technology	3.83	3*	City U. of Hong Kong	4
4*	U. of Arizona	7	5	City U. of Hong Kong	3.67	3*	Hong Kong U. of Science and Technology	4
5*	Atilim U.	6	6	U. of New Orleans	3.00	3*	U. of Connecticut	4
5*	Nanjing U.	6	7	Michigan State U.	2.83	4*	Atilim U.	3
5*	Northeastern U.	6	8	Bond U.	2.67	4*	Bond U.	3
5*	Texas A&M International U.	6	9*	Florida Atlantic U.	2.33	4*	Northeastern U.	3
5*	U. of New Orleans	6	9*	National Chung Hsing U.	2.33	4*	U. of New Orleans	3
6*	Arizona State U.	5	9*	National U. of Singapore	2.33	5*	Bradford U.	2
6*	City U. of Hong Kong	5	9*	U. of Pittsburgh	2.33	5*	College of William and Mary	2
6*	College of William and Mary	5	9*	Atilim U.	2.33	5*	Colorado State U.	2
6*	Institute Technology Brunei	5	9*	U. of Arizona	2.33	5*	Florida Atlantic U.	2
6*	National Central U.	5	10*	State U. of New York at Buffalo	2.25	5*	Hong Kong Polytechnic U.	2
6*	National Chung Cheng U.	5	10*	U. of Connecticut	2.25	5*	Illinois State U.	2
6*	National Chung Hsing U.	5	10*	U. of Florida	2.25	5*	Indiana U. Northwest	2
6*	State U. of New York at Buffalo	5	11*	Colorado State U.	2.00	5*	Institute of Public Health, Aarhus U.	2
6*	U. of Akron	5	11*	Illinois State U.	2.00	5*	Michigan State U.	2
6*	U. of Connecticut	5	11*	Nanyang Technological U.	2.00	5*	Nanyang Technological U.	2
			11*	Software Publishers Association	2.00	5*	National Chung Cheng U.	2
			11*	Texas A&M International U.	2.00	5*	National Chung Hsing U.	2
			11*	National Chung Cheng U.	2.00	5*	National Sun Yat-Sen U.	2
			11*	U. of Akron	2.00	5*	Software Publishers Association	2

§ There are 8 additional institutions with "2" as straight count. We don't show them to save space

* Tied rank

5 Discussion and Conclusions

For this paper, we systematically reviewed software piracy research following Banville and Landry's (1989) model, which prior IS reviews have also employed. Both Banville and Landry (1989) and Zhang and Li (2005) suggest that, in exploring accumulated research, one must address research's cognitive and social aspects. Following this theoretical model, we defined 17 research questions to address five specific areas of inquiry; namely: 1) "what makes up software piracy's intellectual substance?", 2) "do theoretical contributions on software piracy suggest a cross-disciplinary research community on the topic?", 3) "what changes have occurred in software piracy research across the seven measured periods?", (4) "what are the top IS journals' publishing patterns on software piracy research?", and 5) "who has contributed to software piracy research?".

We contribute to understanding the intellectual and social development on software piracy by performing a cross-disciplinary search of the literature. From a cognitive perspective, we found that software piracy studies have predominantly followed a quantitative approach and adopted theories for predicting and explaining and predicting (especially since the year 2000), which is consistent with IS's positivist orientation that other reviews have found (Alavi & Carlson, 1992; Avison et al., 2008; Palvia et al., 2007). Moreover, the data shows that, over time, survey research became the prevailing methodology for studying software piracy. On the other hand, non-empirical research and design science represent a smaller portion of the studies. The results also reveal that over 50 percent of the studies focused on individual level of analysis and that there is paucity of software piracy research in Africa and Latin America where some have claimed that piracy rates are high (BSA, 2012).

From a social perspective, the accumulated research on software piracy suggests that the study of this phenomenon is not restricted to IS. Investigations from research disciplines such as business, finance, economics, criminology, psychology, and education among others have accumulated on software piracy. Consequently, the data suggests that software piracy has generated cross-disciplinary interest. Such interest may have resulted from technology's explosive growth, its ubiquity, and the low barriers to study this phenomenon. Indeed, one does not need an expensive lab to conduct research on software piracy, which allows a diverse range of authors from different research disciplines to study the phenomenon (cf. Bernroider, Pilkington, & Córdoba, 2013). Likewise, researchers have identified that the IS discipline has low barriers to research in general (Bernroider et al., 2013). Thus, Banville and Landry (1989) describe IS research as a fragmented adhocracy in which investigating a subject is open to a variety of researchers with different degrees of experience, to coalitions of researchers that are transient, and to research focused on the practical aspects of phenomena and their consequences. Our data suggests that the scholars studying software piracy also represent such a fragmented adhocracy.

Our results suggest new avenues for potential future research in many areas. First, we need more research at the organizational level with particular emphasis on organizations' role as consumers and/or intermediaries. Second, research in Latin America and Africa would enhance our understanding of software piracy in these regions. Third, research beyond quantitative and positivist traditions would provide new insights into the software piracy phenomenon. For instance, research that develops methodologies that apply analytics to avoid software piracy at organizations may be relevant, given the variety of platforms used to deliver software at organizations, which is making avoiding software piracy a complex subject.

Our results also suggest that software piracy research may have peaked and suggestions that software piracy is no longer an issue may support such a pattern. However, we contend that the research is in a transitional period and that we need to expand our understanding on software piracy as the delivery platforms for software evolve. In the past when mainframes were the main delivery medium, software piracy was not necessarily an important issue. Then, with the arrival of the personal software and microcomputers, piracy turned into an important issue. Now, as we transition into cloud and mobile computing, scholars will have to review what we know about software piracy, analyze the implications that changes in software delivery may have, and conduct studies that could explain how software piracy will manifest under the new computing paradigms.

Our study has limitations. For instance, we limited our search of the literature to the keyword "software piracy". It is possible that using additional keywords such as "digital piracy", "crackers", or "warez" might have returned additional papers to analyze. However, we focused strictly on "software piracy" to concentrate our analysis on that core subject.

Also, we restricted our search to journals indexed by EBSCO and ABI/INFORMS databases. Thus, it is plausible that these two databases do not index some studies. Nevertheless, we believe that, by using these two databases, we have included publications from the most well-known outlets in the social sciences, which should have created a comprehensive set of papers for this systematic review.

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Appendix A: Set of Journals, Authors and Papers Used in This Study

Table A1. List of Journals and Research Discipline

#	Journal	Research discipline	Count
1	<i>Journal of Business Ethics</i>	Business and management	29
2	<i>Communications of the ACM</i>	Information systems	9
3	<i>Information & Management</i>	Information systems	8
4	<i>Behaviour & Information Technology</i>	Psychology and cognitive sciences	5
5	<i>Decision Support Systems</i>	Information systems	4
6	<i>Ethics and Information Technology</i>	Information systems	4
7	<i>Information Systems Research</i>	Information systems	4
8	<i>Journal of Management Information Systems</i>	Information systems	4
9	<i>Journal of Systems Management</i>	Information systems	4
10	<i>Applied Economics Letters</i>	Applied economics	3
11	<i>Business Ethics: A European Review</i>	Business and management	3
12	<i>Journal of Computer Information Systems</i>	Information systems	3
13	<i>Management Science</i>	Business and management	3
14	<i>Computers & Security</i>	Information systems	2
15	<i>Economic Inquiry</i>	Applied economics	2
16	<i>Information Management & Computer Security</i>	Information systems	2
17	<i>Information Society</i>	Information systems	2
18	<i>International Review of Law, Computers & Technology</i>	Law	2
19	<i>Journal of Criminal Justice & Popular Culture</i>	Criminology	2
20	<i>Journal of Economic Crime Management</i>	Criminology	2
21	<i>Journal of Educational Computing Research</i>	Specialist studies in education	2
22	<i>Journal of Information Systems</i>	Information systems	2
23	<i>Journal of Organizational Computing & Electronic Commerce</i>	Information systems	2
24	<i>Security Journal</i>	Criminology	2
25	<i>The Journal of Consumer Marketing</i>	Marketing	2
26	<i>Academy of Information and Management Sciences</i>	Information systems	1
27	<i>Advances in Consumer Research</i>	Marketing	1
28	<i>Annals of the American Academy of Political & Social Science</i>	Other commerce, management, tourism and services	1
29	<i>Applied Economics</i>	Applied economics	1
30	<i>Applied Financial Economics</i>	Banking, Finance and Investment	1
31	<i>Asia Pacific Management Review</i>	Business and Management	1
32	<i>Business Horizons</i>	Business and Management	1
33	<i>Business Strategy Review</i>	Business and Management	1
34	<i>Computer</i>	Information systems	1
35	<i>Computers & Education</i>	Specialist studies in Education	1
36	<i>Computers in Human Behavior</i>	Psychology	1
37	<i>Crime & Delinquency</i>	Criminology	1
38	<i>Cyber Psychology & Behavior</i>	Psychology	1
39	<i>Deviant Behavior</i>	Sociology	1
40	<i>Economics Letters</i>	Applied economics	1
41	<i>Electronic Commerce Research</i>	Information systems	1
42	<i>Electronic Commerce Research & Applications</i>	Information systems	1
43	<i>European Journal of Information Systems</i>	Information systems	1
44	<i>European Journal of Political Economy</i>	Applied economics	1
45	<i>Expert Systems with Applications</i>	Information systems	1
46	<i>Gender & Behaviour</i>	Psychology	1
47	<i>Human Relations</i>	Business and management	1
48	<i>IEEE Transactions on Engineering Management</i>	Engineering	1
49	<i>Industrial Management + Data Systems</i>	Information systems	1
50	<i>Information Economics and Policy</i>	Applied economics	1
51	<i>Information Resources Management Journal</i>	Information systems	1
52	<i>Information Systems Frontiers</i>	Information systems	1
53	<i>Information Systems Journal</i>	Information systems	1
54	<i>International Journal of Cyber Criminology</i>	Law	1

Table A1. List of Journals and Research Discipline

#	Journal	Research discipline	Count
55	<i>International Journal of Engineering Science & Technology</i>	Engineering	1
56	<i>International Journal of Human-Computer Studies</i>	Information systems	1
57	<i>International Journal of Industrial Organization</i>	Applied economics	1
58	<i>International Journal of Information Management</i>	Information systems	1
59	<i>International Journal of Information Security</i>	Information systems	1
60	<i>International Journal of Research in Marketing</i>	Marketing	1
61	<i>International Journal of Social Economics</i>	Other economics	1
62	<i>International Journal of Technoethics</i>	Business and management	1
63	<i>International Journal of Technology Management</i>	Business and management	1
64	<i>International Studies Quarterly</i>	Other commerce, management, tourism and services	1
65	<i>Issues in Informing Science & Information Technology</i>	Library and information studies	1
66	<i>Journal of Applied Management and Entrepreneurship</i>	Business and management	1
67	<i>Journal of Asian Business</i>	Business and management	1
68	<i>Journal of Business Research</i>	Marketing	1
69	<i>Journal of Contemporary Criminal Justice</i>	Criminology	1
70	<i>Journal of Digital Forensic Practice</i>	Other information and computing sciences	1
71	<i>Journal of Economic Behavior & Organization</i>	Applied economics	1
72	<i>Journal of Economics</i>	Economic theory	1
73	<i>Journal of Education for Business</i>	Business and management	1
74	<i>Journal of Global Information Management</i>	Information systems	1
75	<i>Journal of International & Intercultural Communication</i>	Film, television and digital media	1
76	<i>Journal of Internet Commerce</i>	Business and management	1
77	<i>Journal of Marketing</i>	Marketing	1
78	<i>Journal of Medical Systems</i>	Public health and health services	1
79	<i>Journal of Policy Modeling</i>	Applied economics	1
80	<i>Journal of Regulatory Economics</i>	Applied economics	1
81	<i>Journal of Strategic Information Systems</i>	Information systems	1
82	<i>Journal of Technology Education</i>	Curriculum and pedagogy	1
83	<i>Journal of Technology Transfer</i>	Business and management	1
84	<i>Journal of the ACM</i>	Information systems	1
85	<i>Journal of World Trade</i>	Applied economics	1
86	<i>Management Research Review</i>	Business and management	1
87	<i>MIS Quarterly</i>	Information systems	1
88	<i>New Media & Society</i>	Communication and media studies	1
89	<i>Psychological Reports</i>	Psychology	1
90	<i>Public Administration Quarterly</i>	Business and management	1
91	<i>Qualitative Market Research: An International Journal</i>	Marketing	1
92	<i>Quality & Quantity: International Journal of Methodology</i>	Business and management	1
93	<i>Review of Economics and statistics</i>	Applied economics	1
94	<i>Social Behavior & Personality: An International Journal</i>	Psychology	1
95	<i>Software: Practice & Experience</i>	Computer software	1
96	<i>The Canadian Journal of Economics</i>	Applied economics	1
97	<i>The Journal of Business</i>	Business and management	1
Total			179
Australian and New Zealand Standard Research Classification (ANZSRC): http://www.abs.gov.au/ausstats/abs@.nsf/Latestproducts/1297.0Main%20Features32008?opendocument&tabname=Summary&prodno=1297.0&issue=2008&num=&view=			

Table A2. Set of Papers with Authors Publishing Across Different Research Disciplines

#	Paper	Division
1	Sims, R. R., Cheng, H. K., & Teegen, H. (1996). Toward a profile of student software pirates. <i>Journal of Business Ethics</i> .	Commerce, management, tourism, and services
2	Gopal, R. D., & Sanders, G. L. (1997). Preventive and deterrent controls for software piracy. <i>Journal of Management Information Systems</i> .	Information and computing sciences
3	Cheng, H. K., Sims, R. R., & Teegen, H. (1997). To purchase or to pirate software: An empirical study. <i>Journal of Management Information Systems</i> .	Information and computing sciences
4	Gopal, R. D., & Sanders, G. L. (1998). International software piracy: Analysis of key issues and impacts. <i>Information Systems Research</i> .	Information and computing sciences
5	Gopal, R. D., & Sanders, G. L. (2000). Global software piracy: You can't get blood out of a turnip. <i>Communications of the ACM</i> .	Information and computing sciences
6	Moore, T. T., & Dhillon, G. (2000). Software piracy: A view from Hong Kong. <i>Communications of the ACM</i> .	Information and computing sciences
7	Wagner, S. C., & Sanders, G. L. (2001). Considerations in ethical decision-making and software piracy. <i>Journal of Business Ethics</i> .	Commerce, management, tourism, and services
8	Hinduja, S. (2001). Correlates of Internet software piracy. <i>Journal of Contemporary Criminal Justice</i>	Studies in human society
9	Ramakrishna, H. V., Kini, R. B., & Vijayaraman, B. S. (2001). Shaping of moral intensity regarding software piracy in university students: Immediate community effects. <i>Journal of Computer Information Systems</i> .	Information and computing sciences
10	Kini, R. B., Ramakrishna, H. V., & Vijayaraman, B. S. (2003). An exploratory study of moral intensity regarding software piracy of students in Thailand. <i>Behaviour & Information Technology</i> .	Psychology and cognitive science
11	Prasad, A., & Mahajan, V. (2003). How many pirates should a software firm tolerate? An analysis of piracy protection on the diffusion of software. <i>International Journal of Research in Marketing</i> .	Commerce, management, tourism, and services
12	Moore, T. T. (2003). The effect of national culture and economic wealth on global software piracy rates. <i>Communications of the ACM</i> .	Information and computing sciences
13	Hinduja, S. (2003). Trends and patterns among online software pirates. <i>Ethics and Information Technology</i> .	Information and computing sciences
14	Moore, T. T., & Dhaliwal, J. (2004). A reversed context analysis of software piracy issues in Singapore. <i>Information & Management</i> .	Information and computing sciences
15	Higgins, G. E., & Makin, D. A. (2004). Does social learning theory condition the effects of low self-control on college students' software piracy. <i>Journal of Economic Crime Management</i> .	Studies in human society
16	Shin, S. K., Gopal, R. D., Sanders, G. L., & Whinston, A. B. (2004). Global software piracy revisited. <i>Communications of the ACM</i> .	Information and computing sciences
17	Higgins, G. E., & Makin, D. A. (2004). Self-control, deviant peers, and software piracy. <i>Psychological Reports</i> .	Psychology and cognitive science
18	Kini, R. B., Ramakrishna, H. V., & Vijayaraman, B. S. (2004). Shaping of moral intensity regarding software piracy: A comparison between Thailand and U.S. students. <i>Journal of Business Ethics</i> .	Commerce, management, tourism, and services
19	Haruvy, E., Mahajan, V., & Prasad, A. (2004). The effect of piracy on the market penetration of subscription software*. <i>The Journal of Business</i> .	Commerce, management, tourism, and services
20	Higgins, G. E., Wilson, A. L., & Fell, B. D. (2005). An application of deterrence theory to software piracy. <i>Journal of Criminal Justice & Popular Culture</i> .	Studies in human society
21	Higgins, G. E. (2005). Can low self-control help with the understanding of the software piracy problem? <i>Deviant Behavior</i> .	Studies in human society
22	Mishra, B. K., Raghu, T. S., & Prasad, A. (2005). Strategic analysis of corporate software piracy prevention and detection. <i>Journal of Organizational Computing & Electronic Commerce</i> .	Information and computing sciences
23	Moore, T. T., & Chang, J. C.-J. (2006). Ethical decision making in software piracy: Initial development and test of a four-component model. <i>MIS Quarterly</i> .	Information and computing sciences

Table A2. Set of Papers with Authors Publishing Across Different Research Disciplines

#	Paper	Division
24	Higgins, G. E. (2006). Gender differences in software piracy: The mediating roles of self-control theory and social learning theory. <i>Journal of Economic Crime Management</i> .	Studies in human society
25	Higgins, G. E., & Wilson, A. L. (2006). Low self-control, moral beliefs, and social learning theory in university students' intentions to pirate software. <i>Security Journal</i> .	Studies in human society
26	Mishra, A., Akman, I., & Yazici, A. (2006). Software piracy among IT professionals in organizations. <i>International Journal of Information Management</i> .	Information and computing sciences
27	Andrés, A. R. (2006). Software piracy and income inequality. <i>Applied Economics Letters</i> .	Economics
28	Goode, S., & Cruise, S. (2006). What motivates software crackers? <i>Journal of Business Ethics</i> .	Commerce, management, tourism, and services
29	Yang, D., & Sonmez, M. (2007). Economic and cultural impact on intellectual property violations: A study of software piracy. <i>Journal of World Trade</i> .	Economics
30	Hinduja, S. (2007). Neutralization theory and online software piracy: An empirical analysis. <i>Ethics and Information Technology</i> .	Information and computing sciences
31	Mishra, A., Akman, I., & Yazici, A. (2007). Organizational software piracy: An empirical assessment. <i>Behaviour & Information Technology</i> .	Psychology and cognitive science
32	Moore, T. T. (2008). An analysis of the impact of economic wealth and national culture on the rise and fall of software piracy rates. <i>Journal of Business Ethics</i> .	Commerce, management, tourism, and services
33	Hinduja, S. (2008). Deindividuation and Internet software piracy. <i>Cyber Psychology & Behavior</i> .	Psychology and cognitive science
34	Pykäläinen, T., Yang, D., & Fang, T. (2009). Alleviating piracy through open source strategy: An exploratory study of business software firms in China. <i>Journal of Strategic Information Systems</i> .	Information and computing sciences
35	Akman, I., & Mishra, A. (2009). Ethical behavior issues in software use: An analysis of public and private sectors. <i>Computers in Human Behavior</i> .	Psychology and cognitive science
36	Yang, D., Sonmez, M., Bosworth, D., & Fryxell, G. (2009). Global software piracy: Searching for further explanations. <i>Journal of Business Ethics</i> .	Commerce, management, tourism, and services
37	Nill, A., & Shultz, C. J. (2009). Global software piracy: Trends and strategic considerations. <i>Business Horizons</i> .	Commerce, management, tourism, and services
38	Moore, T. T., Nill, A., & Rothenberger, M. A. (2009). Knowledge of software piracy as an antecedent to reducing pirating behavior. <i>Journal of Computer Information Systems</i> .	Information and computing sciences
39	Lu, J. (2009). Chinese culture and software copyright. <i>New Media & Society</i> .	Language, communication and culture
40	Lu, J., & Weber, I. (2009). Internet software piracy in China: A user analysis of resistance to global software copyright enforcement. <i>Journal of International & Intercultural Communication</i> .	Studies in creative art and writing
41	Goel, R. K., & Nelson, M. A. (2009). Determinants of software piracy: economics, institutions, and technology. <i>Journal of Technology Transfer</i> .	Commerce, management, tourism, and services
42	Goode, S. (2010). Exploring the supply of pirate software for mobile devices. <i>Information Management & Computer Security</i> .	Information and computing sciences
43	Nill, A., Schibrowsky, J., & Peltier, J. W. (2010). Factors that influence software piracy: A View from Germany. <i>Communications of the ACM</i> .	Information and computing sciences
44	Gopal, R. D., & Gupta, A. (2010). Trading higher software piracy for higher profits: The case of phantom piracy. <i>Management Science</i> .	Commerce, management, tourism, and services
45	Moore, T. T. (2010). Untangling the web of relationships between wealth, culture, and global software piracy rates: A path model. <i>Journal of Global Information Management</i> .	Information and computing sciences

Table A2. Set of Papers with Authors Publishing Across Different Research Disciplines

#	Paper	Division
46	Liu, Y., Cheng, H. K., Tang, Q. C., & Eryarsoy, E. (2011). Optimal software pricing in the presence of piracy and word-of-mouth effect. <i>Decision Support Systems</i> .	Information and computing sciences
47	Moores, T. T., & Esichaikul, V. (2011). Socialization and software piracy: a study. <i>Journal of Computer Information Systems</i> .	Information and computing sciences
48	Andrés, A. R., & Goel, R. K. (2012). Does software piracy affect economic growth? Evidence across countries. <i>Journal of Policy Modeling</i> .	Economics
49	Goode, S., & Kartas, A. (2012). Exploring software piracy as a factor of video game console adoption. <i>Behaviour & Information Technology</i> .	Psychology and cognitive science
50	Kartas, A., & Goode, S. (2012). Use, perceived deterrence and the role of software piracy in video game console adoption. <i>Information Systems Frontiers</i> .	Information and computing sciences
51	Goel, R. K., & Nelson, M. A. (2012). Shadow economy and international software piracy. <i>Applied Financial Economics</i> .	Commerce, management, tourism, and services
52	Andrés, A. R., & Asongu, S. A. (2013). Fighting software piracy: Which governance tools matter in Africa? <i>Journal of Business Ethics</i> .	Commerce, management, tourism, and services

About the Authors

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Jerald Hughes received his PhD degree in business, Computer Information Systems, in 2006 from the Zicklin School of Business, Graduate Center of the City University of New York, having taught at CUNY's Baruch College first as an adjunct, then as an Instructor, since 1999. Beginning in 2006, he served as Assistant Professor in the CIS department of the College of Business Administration of the University of Texas—Pan American in the Rio Grande Valley, promoted to Associate Professor effective Fall 2012. He served the college as Associate Dean for Undergraduate Education from 2011 to 2015, and is now the chair of the Information Systems department of the College of Business and Entrepreneurship in the newly created University of Texas Rio Grande Valley. His research interests include digital information goods, e-commerce, information systems security, and text analytics.

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