

**DEVELOPING AN IT VIEW-BASED
FRAMEWORK FOR IS ETHICS RESEARCH**

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ABSTRACT

The field of information systems ethics is much like the field of information systems (IS) in its diversity and wide range of applications. Utilizing this similarity, the following literature review demonstrates a unique framework for the body of research involved with information systems ethics. The new framework is based upon the idea that IS ethics is comprised of a set of research that is directly related to IS. The paper delineates the work that has been done in IS ethics by imposing a well-known classification of IS onto the IS ethics literature. The conclusion of the exercise is a roadmap for future research that illustrates the importance of maintaining a strong connection between IS ethics and all of the various perspectives from which information systems are viewed and studied.

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INTRODUCTION

The diversity of places and ways in which people interact with technology continues to grow and develop at unprecedented speeds. Communication, business, education, and entertainment are just a few of the institutions being revolutionized at the astonishing pace with which information technology takes its place in and leaves its mark on an increasingly information-centric society. As the relationships continue to develop between people and the systems they create, use and otherwise come in contact with, questions arise as to the ethical ways of doing so. Within each revolutionary use for an information system (IS), there is potential for a revolutionary application of age-old ethics. As information systems become even more strongly integrated into daily routines, uncertainty is experienced as morally questionable situations involving those systems are continually encountered (Mumford, 2003). IS ethics research, therefore, is involved with the study of potential system abuses and malfunctions, and the theories that surround them. Perhaps an understanding of these can inform the proper way to address or prevent these situations in common business, social, and day-to-day environments.

The goal of this paper is not to delineate each and every ethical issue that has arisen in the world of information systems, for they are too many and ever changing. As Maner (1996) points out, “we have not been able to assemble a critical mass of self-defining core

issues.” Nor is our goal here normative -- to differentiate right from wrong in IS ethical dilemmas, nor even to teach a lesson on how to reach the “right” conclusion. That task is left for the ethicists, to hash out the different approaches to each and every ethical dilemma. Rather, the current study seeks a descriptive review of the literature of IS ethics as one body, and the definition of a framework into which all IS ethical issues can be neatly placed. Establishing a framework for the study of IS ethics seems as daunting a task as categorizing the diverse components of IS itself. Yet prior research that has done so for IS provides encouragement in the attempt to apply the same line of reasoning to IS ethics. By classifying the research that has been done in IS ethics, the following analysis helps define and organize the diverse research space of IS ethics.

The remainder of this paper will ascribe to the following procedure. First some background supporting the field of IS ethics sets the stage for the quest for a framework to define the field. Included in this section is a discussion of metaresearch literature pertaining to the question of whether or not IS ethics is unique and thus deserving of its own field of research study. Next is a description of the categorizations that past researchers have made as they examined the literature base of IS ethics. What emerges from these first two sections is a sense of the vast diversity in the way that past and current researchers view, conceptualize, and define IS ethics. The statement made by Gotterbarn and Rogerson (1997) that the “many views of what computer ethics comprises...is probably due to a difference in perception among computing characteristics...” lends some insight as to a possible explanation for the multiplicity of thought and leads to the development of a new, IS-centric framework for the study of IS ethics. The new framework capitalizes upon the above statement made by Gotterbarn and Rogerson, by

making the claim that people's views of IS ethics will differ along with their view of IS itself, and is based upon a classification of the different views of IS within IS research that has been proposed by Orlikowski and Iacono (2001). In formulating the new categorization, as many examples of specific IS ethics research works as possible are briefly reviewed and classified. The proposed categorization helps define IS ethics research in terms of IS and point future researchers to a strengthened link between the two fields.

BACKGROUND

Ethics, simply defined, are principles of right or good conduct (American Heritage Dictionary, 1982). The study of ethics has been practiced since ancient times and has been applicable in every generation since. Any decision that involves possibilities that by social standards are not exclusively right or wrong is a situation in need of the application of ethical principles (Kallman & Grillo, 1996, page 5). Such principles have been conceptualized, debated, and developed by philosophers over the ages. In our times, new technological developments bring about new situations in which decision makers must call upon their ethical principles to aid them in making their choice of conduct. Discussion of these principles, an area of philosophy sometimes referred to as metaethics (Weckert & Adeney, 1997, page 12), comes in a few varieties. Weckert and Adeney (1997, page 2) summarize these by describing the major camps of philosophical thought. Objectivists, they explain, are those who believe that there exist moral truths that are universally good. These truths might be naturally observable, perceived through intuition, commanded by a divine power, or rationally thought out. On the contrary, relativism, such as cultural

relativism, professes that moral values are relative to the particular culture or society in which they exist. Likewise, subjectivism views moral values as relative to the individual who holds them, citing no objective measure with which to judge them. A similar nomenclature of ethical thought is the division between deontology and teleology or consequentialism. While the former is the belief that a set of universal rules defines an individual's rights and duties, the latter describes the belief that rightness or wrongness of an action is based on its consequences, such as benefit to oneself (egoism), the good of a group (utilitarianism), or benefit to others despite a personal sacrifice (altruism) (Kallman & Grillo, 1996, page 13). Although some research does specifically tap into these general ethical beliefs in their discussion of IS ethics (Smith, 2002; Thong & Yap, 1998; Ellis & Griffith, 2001), Weckert and Adeney (1997, page 13) point out a disconnect between the meta-ethical view that one holds and one's position on a particular issue. Therefore, discussion of ethics at the level of a particular issue merits its own focus and need not necessarily be connected with that at the more general level.

In the discussion of particular issues that involve ethical dilemmas, often a strong relationship with laws regarding those issues is apparent. While such a relationship does exist, as laws are often created based upon ethical assessments, it is pointed out that legal and ethical statuses are not by any means interchangeable. While one action might be both ethical and legal, another could be ethical but not legal, legal but not ethical, or neither ethical nor legal (Kallman & Grillo, 1996, page 8). Within discussions of ethical issues that involve the use of computer systems, this is especially apparent as the legal systems scurry to keep up with the rapidly changing technologies and their influences on society. While the connection with legal status is often tied into discussions of ethical IS situations

(Bloom et al., 1994; Hubbard et al., 1998; Milberg et al., 1995; Milberg et al., 2000; Sipior & Ward, 1995; Wahl, 1994) ethicality is in essence a discussion of its own, regardless of the legality involved with the issue at hand. In fact, Grosso (2000) raises an example of a case where, he argues, the law does not adequately represent the ethical status of electronic theft. Still, the focus here remains upon the issues in which computer systems are involved with ethical dilemmas.

A review of the IS ethics literature would be remiss not to mention the debate that is prevalent among IS ethics researchers regarding the questionable uniqueness factor of their research field. It has been asked whether the issues deemed IS ethical issues actually comprise a distinct research area, or are they perhaps merely a collection of specific applications of ethics questions much like any other? A pioneer in this area of thought is Moor (1985) who argues “for the special status of computer ethics as a field of study.” The development of new technologies creates policy vacuums – i.e., scenarios regarding which no policies have yet been developed -- that cannot always merely be filled by previously defined rules and principles which are based on generally accepted concepts (Johnson, 1999; Moor, 1985). Technological developments also produce “conceptual muddles” (Johnson, 1999; Moor, 1985). For example, the traditional concept of ownership has to be completely redefined when we begin to talk about ownership of digital media. When one *owns* a computer program, does one own the physical storage medium, the sequence of zeros and ones that make up the program, or perhaps, the set of instructions used to make that program? Furthermore, the use of computers, according to Johnson (1999), has completely changed the ‘instrumentation of human action’, affording people the ability to perform acts that were not possible without computers. Even the acts that

were possible are forever changed with the infiltration of computer systems. Computer innovations are revolutionary to such an extent that a “new species” of ethics is born as we reconceptualize common ethics ideas and adapt them to their new computerized environment (Johnson, 1999).

Maner (1996) takes a more extreme approach as he calls for the discovery of “new moral values” and the formulation of “new moral principles” in addition to the aforementioned new policies and new ways of thinking about traditional issues. The advent of computer systems has created a large and coherent enough set of novel and transformed issues to warrant the development of a whole new ethics field rather than just a new species of the existing one (Maner, 1996). This, he explains, is because the nature of computer systems adds a uniqueness to these issues that causes them to have no analogy in any non-computing moral setting. For example, the fact that disastrous consequences can occur as a result of the smallest action, such as the omission of a word from a computer program, is an attribute that is unique to computers and has no analogy to any other machine in the world. We therefore have to rethink the entire stream of ethical analysis (consequentialist) that insists that actions are good or bad based upon the consequences that result from them. With the use of computers, this no longer applies because we no longer have the same conception of the consequences of our actions that we once did (Maner, 1996). Gorniak (1996) takes this idea of uniqueness to an even further extreme as she predicts that as the computer revolution progresses in its global nature, computer ethics will eventually completely replace all current ethics theory universally.

Despite these arguments in favor of the uniqueness of the field of IS ethics, there are many who still feel “that there is actually no special category of computer ethics;

rather, there are ethical situations in which computers are involved,” (Kallman & Grillo, 1996, page 4). Gotterbarn and Rogerson (1997) cite a meeting in which an early writer about ethical issues in computing referred to computer ethics as specific cases of micro-ethics deserving no mention as a special field. Stahl (2002) attributes such opinions to the feeling that “computers only become ethically relevant because of their ubiquity in modern society and because we cannot avoid their use in our everyday moral dilemmas.” Weckert and Adeney (1997, page *ix*) also express this sentiment: “Ethics is about human conduct, and the use and development of computer technology is part of human conduct.”

Having gained insight into some of the justifications for and hesitations about studying information systems ethics as a unique discipline, it must still be noticed that notwithstanding the arguments, ethical issues regarding information systems have been a research object for many years. Given its widespread relevance to daily life and its dynamic nature, IS ethics remains an interesting subject of study regardless of its uniqueness (Tavani, 2002). Delving into this literature we turn to the different approaches that researchers have taken to categorizing and labeling the different issues that are studied in this area.

CATEGORIZATIONS OF IS ETHICS

In order to properly deal with ethical dilemmas, managers and other computer users must first be able to recognize their situation as such (Smith, 2002). It will therefore be very helpful to study the frameworks that attempt to clearly define the domain of such potential dilemmas. The best known classification of the concerns that make up the IS ethics field is the following model created by Mason (1986), known by its acronym as

PAPA – Privacy, Accuracy, Property, and Accessibility. In this model, all the varied vulnerabilities involved in the reliance upon intellectual capital in the information systems age can be summarized by those four categories. Though the examples for each category brought by Mason are somewhat limited to the decade in which he wrote them, the concepts are ones that are easily adapted to a more current systems environment.

Privacy. Even as the automation of so many processes makes interactions between people increasingly impersonal, the wealth of information being gathered and stored seems in some sense to be making those processes all the more personal – sometimes too personal. The power that current and future information systems afford us with to gather information about people, their preferences, and their activities by way of surveillance, communication, storage and retrieval is increasing (Mason, 1986). This concept, coupled with the added information that we can learn by aggregating the data stores of disparate systems and then analyzing them using the techniques evolving in the field of data mining, affords the opportunity for potential exploitation of the private dimensions of people’s lives. Employee monitoring, archiving of communications, merging databases among companies, etc. are just a few examples of the types of issues that fall under this category of IS ethical issues.

Accuracy. Even once the ethicality of the collection of data has been determined, the question of accuracy is often encountered. In the business of information, we depend heavily upon the accuracy of that information. Systems that collect information about people can portray a very wrong profile of somebody if information is inaccurate. For information that is used by systems that make financial decisions, weather pattern predictions, aircraft flight decisions, medical assessments, or wartime combat judgments,

inaccuracies could potentially have devastating effects. Works regarding the accountability for and improvement of information inaccuracy define this category of IS ethics research (example: Mathieu & Woodward, 1995).

Property. In this category Mason goes on to describe the question of who owns the knowledge that is embedded in computer systems. Furthermore, how can we ensure proper compensation for the distribution of intellectual property? Softlifting, copying of digital art forms, and the ease with which users can now transfer electronic content are all subjects for study in this area of IS ethics (examples: Phukan & Dhillon, 2000; Glass, 1996; Grosso, 2000). In addition, the issue of who owns the media through which electronic data is transported is an issue discussed within this category.

Accessibility. Finally, in the category of access, Mason mostly describes the potential social problem in which progress -- that is increasingly reliant upon access to information via computers -- is limited only to those who have the education, resources, and money to access the information they need. Mason calls for a new social contract to help insure the ideal society in light of the trends toward increased focus on information in this and the other three categories.

Though this framework seems to be quite inclusive, the scope is still somewhat limited as there are a number of issues that have been discussed that clearly don't fit into this classification (Smith, 2002). For example, the recent questions related to the transformation, exporting, and loss of jobs and job tasks due to evolving computer system uses and capabilities are real ethical issues that have no place in Mason's framework. Additionally, the quandaries that arise during the development of computer systems relating to design and potential uses of the systems are examples of important items not

dealt with at all in Mason's piece. In response, perhaps, there have been other attempts at summarizing the IS ethics issues into distinct types. Some echo the ideas presented in the PAPA framework -- at times seemingly appending additional ideas that might be missing from the original, at others perhaps modifying the structure of the framework. The structure of Johnson's book on computer ethics tells of her perspective of the framework of the field (Johnson, 1985b). She divides the issues involved into the following four categories similar to Mason's: responsibility for malfunctions in computer programs, privacy, power, and ownership. A similar analysis of Weckert and Adeney's book (1997) reveals the IS ethics categories of freedom of information, censorship of the Internet, intellectual property, privacy, responsibility, artificial intelligence, quality of life and work, virtual reality, and machine-mind morality. Hauptman's (1999) categorization consists of the problems of privacy, fraud, monitoring and surveillance, censorship, integrity, and overload. Anderson et al. (1993) develop the following nine classes of technology situations that call for ethical decision making: intellectual property, privacy, confidentiality, professional quality, fairness, liability, software risks, conflicts of interest, and unauthorized access to computer systems. Other classifications are much more specific in their conceptualization of the IS ethics issues. De George (1995, page 338) notes the concepts of information, privacy, and property as they emerge with the introduction of computers to business in the following problems: computer crime; responsibility for computer failure; protection of computer property, records, and software; and privacy of the company, workers, and customers. Langford (1999, page 108) divides the ethical problems specifically related to Internet computing into data piracy, publication

of inaccurate or deliberately erroneous material, inappropriate linking, trademarks, and domain name passing off.

Despite these seemingly corrective attempts, there is still one common feature that underlies all of these classification schemes. They are all attempts at creating a collection of specific existing ethical quandaries and clustering them in one way or another based on similarities among them. Many are not explicit frameworks that are based on any theoretical idea; rather they are post hoc organizational ideas that are aimed at simplifying the vastness of IS ethics issues. While each is useful in its own context of discussion, there is a danger that as the IS environment continues to evolve and ethical issues disappear as new ones develop, any framework developed in such a manner would soon be antiquated and require modification. Even the more structured frameworks of the group, such as Mason's PAPA, are collected into categories that coincide on ethical concepts. Without a strong link to bind the ethical issues to IS itself, the previous classifications remain merely collections of ethics issues with no promise to remain comprehensive as information systems change. A few authors do take a somewhat more IT-oriented approach to the classification of the IS ethics field, such as Gotterbarn and Rogerson (1997) who separate the areas of interest in computer ethics into the general subjects of a) abuses committed with computers including fraud and theft, b) the effects computers have on a changing society, and c) ethical issues related to the development of software systems. A similar approach is seen in the following misuse categories delineated by Oz (1994): a) offenses that existed before the advent of computers but were facilitated by computers, b) offenses against computers, computer equipment, and software, and c) the invasion of privacy. Because in these ideas the computer ethics issues are examined and classified as they

actually relate to computers, they are the beginnings of a more IT-based approach to IS ethics. However, their completeness is unknown because they still lack an explicit link to IS research.

With this review of the many ways in which the studies of IS ethics issues have been classified in the past, it is clear that there is no one theoretical basis that serves as a reference for classifying IS ethics research, as each analysis develops its own categorization. It is observed that most of them seem quite comprehensive, yet they are numerous and diverse. Each subscribes to a different level of specification and directs major focus to a different group of issues. Gotterbarn and Rogerson (1997) address the question of the blatant multiplicity of views of what computer ethics comprises. They attribute “this richness of opinion... to a difference in perception of computing characteristics, the adopted focus..., and the disciplinary background.” They go on to list the different types of perspectives that are affecting the IS ethics researchers’ view of their field. The perspectives mentioned include the properties of computer technology, the concept of computing, the application of computing, and the human value impact of computing. These perspectives are said to give rise to different conceptions of IS ethics issues and are quite reminiscent of the ‘views’ that Orlikowski and Iacono (2001) have delineated regarding IS research itself in that in each perspective, the ‘IT artifact’ is situated in a different position within the research and perceived from a different point of view.

Taking a deeper look at the *views* of IS research that Orlikowski and Iacono have defined can assist us in conceiving a new categorization of IS ethics research – one that will help us understand the components of the IS ethics literature and guide our future

research in the field. IS ethics research is by our definition a body of ethics research that is directly related to IS research. Therefore, applying the same *views* to the IS ethics literature, we can define IS ethics in terms of IS research. Thus, Orlikowski and Iacono's notion of conceptualization of IT becomes the link between IS research and IS ethics research that will ensure that the two move in the same direction.

CATEGORIZATION OF IS RESEARCH

In their analysis of ten years' worth of articles in *Information Systems Research*, Orlikowski and Iacono (2001) determine five views of IS research that they differentiate based on the positioning of information technology within the different types of research articles. Each view is then subdivided further into subcategories. The views and their subcategories are illustrated in Table 1.

In the 'Tool View', information technology is seen as a tool to affect, alter or transform different aspects of organizations and society. The technology itself is a black box that is assumed to be stable and usable by anyone and is not the focus of the studies in this category. Rather, the construct being affected by the use of the technology is generally the focal point of the studies. *Technology as a tool* is found to manifest itself in four different ways in IS research. Information technology has been shown to be studied as a tool for labor substitution, a productivity tool, an information processing tool, and a social relations tool.

The 'Proxy View' of information technology involves a focus on a key element that is "understood to represent or stand for the essential aspect, property, or value of the information technology". The studies in this category measure other constructs in an

attempt to better understand the technology. For example, in *technology as perception*, the technology is measured using assessments of users' perceptions of that technology.

Technology has also been represented by its diffusion or acceptance into an organization or society. Finally, technology has been represented as capital – by measures of various dollar amounts as they are invested in or profited from technology implementations.

The 'Ensemble View' of technology studies the various factors that influence how information systems came to be the way they are – either from the standpoint of their development or the way in which they are used. Most basically, research that focuses on the actual process of designing, developing, and implementing an information system is included in this category. On a more macro level, studies in the *technology as a production network* subcategory of the ensemble view look at the ways that parts of the whole computer industry came to be developed. In addition, studies in this category looked at how social influences affect the ways in which technology was introduced to and accepted into a given society and how different user groups interact with that technology. Finally, along the same lines, technology is seen as having been developed to include some social structure. Some studies in the ensemble view concentrate on how users have appropriated these social structures.

Lastly, the 'Computational View' looks at the actual capabilities of the information technology itself rather than how it interacts with people in society. Such research has developed, tested and discussed particular algorithms to fulfill human uses. Other types of computational IS research have used computer programming to model or simulate some "social, economic, or informational phenomena".

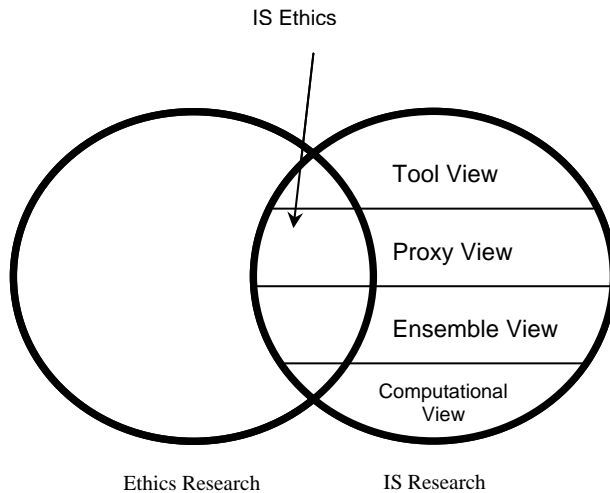
Orlikowski and Iacono also mention the ‘Nominal View’ where the information technology takes a back seat in the research and is “essentially absent” as a variable in the studies that fall into this category. This category will not play a role in the subsequent discussion as the IS component is key in connecting the IS framework with the following parallel one for IS ethics research.

Table 1: Classification of IS Research by Conceptualization of IT
(Orlikowski & Iacono, 2001)

Tool View	Proxy View	<i>Ensemble View</i>	<i>Computational View</i>
-- Labor substitution	-- Perception	-- Project development	-- Algorithm
-- Productivity	-- Diffusion	-- Production network	-- Model

PROPOSED FRAMEWORK FOR IS ETHICS RESEARCH

Figure 1 - IS Ethics Research Space Defined



If the argument is to be made that IS ethics research is the body of research where IS research overlaps with ethics research, then the framework just described can necessarily be imposed upon the IS ethics literature as well. (See figure 1.) Surveying the IS ethics literature, we indeed note that

Orlikowski and Iacono's views can be used as a guideline to divide the issues discussed in IS ethics research. As technology is used and perceived from each of the different standpoints, questions and discussions arise regarding the ethical and unethical ways of doing so. Following is a breakdown of the IS ethics literature within the framework that has just been introduced regarding IS research. The ethical issues that arise within each of the IS views are summarized in Table 2 and the research works related to each are delineated.

Tool View. Parallel to Orlikowski and Iacono's tool view of information systems research, there is clearly a group of IS researchers that have conducted studies of IS ethics within which information technology is used as a tool. In this stream of research, we are reminded of some of the definitions of computer ethics that highlight the uniqueness of computers and their applications in an ethical society. The power and reach that we gain with the use of computer systems provides us the opportunity to accomplish things that we

would otherwise not have been able to achieve. However, the misuse of this power is what comprises this category of computer ethics. A good description of this category is one that is used to describe one of the areas of IS ethics mentioned by Gotterbarn and Rogerson (1997) – “abuses committed with computers including fraud and theft.” Included in this category will be all the ethical issues in which computer technology is used as a tool to commit some crime or impinge on the rights of other individuals.

Surveillance (Sipior & Ward, 1995), hacking, security breaches (Laudon, 1995), pornography distributed on the Internet (Conger & Loch, 1995), spam (Spinello, 1999), and the spreading of viruses (Johnson, 1997) are all examples of using computers as a tool to achieve malicious intentions. In a survey of practitioners, Hilton (2000) attempts to determine the extent of knowledge regarding the misuses of computers such as falsifying data or changing user access levels and deleting data or making programs execute inaccurately. In her discussion of “ethics online” Johnson (1997) delineates the unethical abuses for which online communications provide the opportunity. Among them are snooping, stealing, harassment, defaming, and sabotaging as well as unauthorized access, theft of electronic property, launching of destructive worms and viruses, and racism. Straub and Nance (1990) also investigate different types of computer abuses as they search for a security effort management solution.

Specifically, regarding the subcategories of the tool view, IS ethics literature seems to echo the *technology as a labor substitution tool* category in its discussion of the way job functions are changed or replaced by the introduction of computer systems into the work environment. It is often noted that ethical questions arise as computer systems are implemented to take on the tasks that were previously performed by humans whose jobs

require less skill, accordingly (Panteli & Corbett, 1995). An example of such is detailed by Cottrell (1999) who observes this concept of deskilling in librarian tasks, such as cataloguing, with the continued introduction of computers to the library. Although Grosch (1994) takes an extreme view of this issue as he rails against the computer systems that are putting “ordinary people out on the streets”, Weckert and Adeny (1997, page 126) ask only whose ethical responsibility it is to act on behalf of the people whose jobs are lost or whose skills become obsolete as a result of technological change in the workplace.

Technology as a tool for productivity also appears to have a parallel in the IS ethics literature. While technology has proven to be an invaluable tool for increased productivity, an issue of ethics has come up regarding some of the methods for which companies use technology to ensure high productivity. Ethics has taken issue with companies who use technology to monitor their employees (Kallman, 1993; Loch, et al., 1998) saying that it violates an employee’s right to privacy (Hartman & Bucci, 1999; Kallman, 1993; Moore, 2000; Schulman, 1998) and can have negative effects such as stress (Kallman, 1993) and unfair performance evaluations (Hawk, 1994). Similar discussion also revolves around the ethicality of monitoring employee e-mail (Sipior, et al., 1998). Another productivity-enhancing technology that has come up against some ethical obstacles is telecommuting. While use of telecommuting aims to yield higher productivity through cost and time savings, issues of trust, time versus quality, and the definition of what work entails pose as ethical hindrances (Guthrie, 1997). Additionally, telecommuting deprives workers of socialization opportunities and creates a situation from which exploitation can develop (Weckert & Adeney, 1997, page 125).

The manifestation of *technology as a tool for information processing* arises within the IS ethics research in the discussion of privacy issues. The information processing power that computer systems afford us with brings about many questions of the ethical use of the information that is collected and then analyzed (Clarke, 1988; Davison et al., 2003). The concern for information privacy continues to have a tremendous impact on the businesses of many industries and their various relationships. Thus, it has been the subject of much research that strives to uncover the nature of the concern and discern how it can best be handled.

Companies must deal with information privacy as they relate with their customers as well as with their own employees. As the Internet becomes a standard way of conducting commerce, companies must become aware of and attempt to accommodate their users' concern for privacy on the Web (Hoffman et al., 1999a). Neglecting to do so will likely affect the willingness of consumers to engage in electronic commerce over the Internet (Hoffman et al., 1999a; Whitman et al., 2001; Belanger et al., 2002; Stewart & Segars, 2002; Turner & Dasgupta, 2003). The collection of information for marketing purposes (Bloom 1994; Foxman & Kilcoyne, 1993; Milne, 2000; Smith & Hasnas, 1999; Wang et al., 1998) and the placement of cookies in consumers' browsers to track their Web usage (Bennett, 2001; Whitman et al., 2001; Charters, 2002; Turner & Dasgupta, 2003) are examples of causes for concern for Web users. Within the workplace, collection of personal information for personnel selection (Connerley et al., 1999; Eddy et al., 1999; Fusilier & Hoyer, 1980; Hubbard et al., 1998) and human resources records (Taylor & Davis, 1989), and employee surveillance of email (Cappel, 1995; Sipior & Ward, 1995; Weisband & Reinig, 1995) and other activities (Hartman & Bucci, 1999; Hawk, 1994;

Kallman, 1993; Loch et al., 1998; Moore, 2000; Schulman, 1998) are some grounds for concern over privacy.

In attempt to conquer the privacy problem, researchers have taken three approaches. The first seeks to understand the nature of the people who are looking for privacy. Studies have explored the personal characteristics of privacy seekers (Stone et al., 1983; Culnan, 1993; Milberg et al., 1995; Culnan & Armstrong, 1999; Whitman et al., 2001; Stewart & Segars, 2002), including computer literacy (Loch & Conger, 1996), education level (O'neil, 2001), introversion (Mael et al., 1996), and self-esteem (Hsu & Kuo, 2003).

In addition to the examination of the concerned population, the second research approach identifies factors within a technology setting that can affect the concern for privacy. While some feel that there can be an economic incentive to disclose (Hann et al., 2002) others describe a purely social relationship based on trust (Culnan & Armstrong, 1999; Grabner-Kraeuter, 2002; Turner & Dasgupta, 2003). A few researchers discuss the role of anonymity in alleviating the concern for privacy on the Web (Hoffman et al., 1999b; Wallace 1999), while Belanger et al. (2002) underscore the benefits of security features. Still others point out the importance of the subject's role in the decision to disclose (Lally, 1996) suggesting allowing users to authorize dissemination of their personal information and specify the target of such dissemination (Eddy et al, 1999). Technologies that enable privacy are also a major area of exploration for researchers (Turner & Dasgupta, 2003).

Finally, in attempt to understand the essence of the privacy being sought, researchers describe the characteristics of the information that lead to privacy concerns and

of the concern itself. While some researchers are satisfied to break the concern for information privacy into only two dimensions – environmental control and secondary use of information (Goodwin, 1991; Hoffman et al., 1999b), Smith et al. (1996) find the following four: collection, unauthorized secondary use, improper access, and errors. Still, Mael et al. (1996) describe the information that is generally considered invasive as verifiable, transparent, and personal items. One more cited study categorizes the information of concern into identity information and profiling information (Turner & Dasgupta, 2003).

While it is the hope that by uncovering the privacy issue from these three angles a solution will solidify, some researchers note the role of regulatory policy (Milberg et al., 1995; Milberg et al., 2000) and look to the government for help (Clarke, 1999). Others, however, hope that the players in the privacy arena can fend for themselves in an environment of self-regulation (Culnan, 2000).

The subcategory of *technology as a tool for social relations* makes an appearance within the IS ethics research as well. As computer systems have a more and more substantial effect upon the way people relate and communicate socially, there is an increased awareness of the unethical issues involved with such systems. One electronic communication system that encounters ethically charged scenarios is e-mail. Some research works related to e-mail ethics questions try to capture users' perceptions of their privacy in email communications, their rights to such privacy, and the factors that contribute to those perceptions (Cappel, 1995; Sipior & Ward, 1995; Weisband & Reinig, 1995). Another focuses on the ethical quandary of employee monitoring of e-mail as it relates to the legal protection of such monitoring (Sipior et al., 1998), while still others

note the unethical behavior of e-mail spam (Spinello, 1999) and the distribution of viruses and other malicious code made possible by e-mail (Cerf, 1989; Chapman, 1989; Gordon, 1995; Johnson, 1997; Gattiker & Kelley, 1999; Whitman et al., 1999).

Another instance where technology is used as a means of social communication is in the case of the Internet. This worldwide network has become the home for a myriad varieties of personal interaction such as chat rooms, newsgroups, and Web sites. The ethical issues that communication over the Internet suffers from include cyberstalking, the invasion of privacy, explicit content, and defamatory language (Johnson, 1997; Lipinski et al., 2002; Tavani, 2002; Tavani & Grodzinsky, 2002; Thiesmeyer, 1999). Discussions over who is liable for such offenses that occur (Vedder, 2001; Tavani & Grodzinsky, 2002) and protection of children from them (Sandy, 2003) are included in this literature as well. Also brought to light, is the ethicality of censorship in Internet communications, such as virtual communities, (Mowbray, 2001) and the issue of regulation (Rosenberg, 2001; Weckert, 2000). The ethical issues of Internet communication are related by one author to the acronym, MAMA (multicultural, adaptive, multifaceted, archival), representing the four characteristics of Web-based systems that enable ethical issues (Schuldt, 2003).

From quite a different angle, one interesting study in the area of *technology as a tool for social relations* looked at how computers as a communication medium affect groups' ethical decision making process (Cappel & Windsor, 2000). Although in this study, no significant difference is found in terms of many aspects of group decisions between the groups that used computer mediated communication to make group decisions of an ethical nature and those who decided face-to-face, some possibilities for using GSS technology in an ethical decision making context are examined.

Proxy View. The proxy view is one in which technology is conceived of through the measurement of some other representative element. Just as was found in the IS literature, IS ethics literature is conceptualized through the three proxies of perception, diffusion, and capital.

In *technology as perception*, Orlikowski and Iacono describe the studies that endeavor to measure users' perceptions of the technology – for example how useful they find it and whether they intend to use it – in attempt to understand peoples' motivations to accept and use certain technologies. Similarly, a large part of the IS ethics research concentrates on the perceptions of the ethicality of such intentions to use technology. The studies seek to understand what factors motivate users' intention to act ethically or unethically in their acceptance and use of technologies.

Much of the IS literature relating to user acceptance stems from the work of Fishbein and Ajzen who modeled the theory of reasoned action (TRA) and the closely related theory of planned behavior (TPB) to explain the factors that are antecedent to the intention to perform a specific action. Concerning IS ethics, Foltz et al. (2002) show that the TPB can be directly applied to IS misuse and computer crime. Loch and Conger (1996) apply the TRA to the intention to act ethically using computers, adding self image, gender differences and some computer-related factors, such as deindividuation and computer literacy, to the attitude and social norms factors originally proposed by Fishbein and Ajzen as factors. Among the applications of a TRA-type framework to the intention to pirate software (Glass, 1996; Logsdon, 1994; Peace et al., 2003; Seale et al., 1998; Simpson, 1994; Solomon & O'brien, 1990), it is found that, not knowledge of piracy laws, but perception of reference groups is directly related to propensity to pirate (Christensen &

Eining, 1991). Other studies that also focus on individual and situational characteristics as they influence the intention for ethical behavior find that moral beliefs, organizational climate (Banerjee et al., 1998), self-esteem (Hsu & Kuo, 2003), and tenure with a company (Banerjee et al., 1996) are strong factors in the determination of such behavior. Another such study finds that age and gender are instrumental in determining ethical behavior. “Older computer users were found to have a less permissive sense of what is right and wrong for an illegal game... [and] men and women differed in their assessment of its appropriateness.” (Gattiker & Kelley, 1999) Kreie and Cronan (1998) also present differentiations between genders as they delve into the individual, societal, belief system, legal, and professional factors that influence the ethical judgments of each. Women “were more conservative in their judgments” and “men were less likely to consider a behavior as unethical” in the scenarios presented to subjects as part of their experiment. Although, others also observed similar distinctions between genders and their ethical behaviors (Banerjee et al., 1996; Khazanchi, 1995), Pearson et al. (1997), found that gender along with various other personal characteristics had no impact on an individual’s ability to identify ethical criteria. A construct called *ethical computer self-efficacy* (Kuo & Hsu, 2001) and ethical judgment processes (Thong & Yap, 1998) are also seen to be factors in the determination of ethical IS action.

One more factor that is proposed to have an effect on the intention to act ethically using information systems is company and IS-specific codes. Pierce and Henry (2000) attribute the “moral stress” in computer use within an organization to incongruence between personal norms, the perceptions of co-worker norms, and the perception of organizational norms. The solution, based on their study is to provide company or IS

codes as a source of explicit guidance in such situations to alleviate ambiguity at least about organizational norms. Harrington (1996) conducted a study that differentiates between the two types of codes claiming that company codes are effective in clarifying responsibility for those who tend to deny it, while IS-specific codes actually influence judgments regarding computer abuse. Using their survey, Kreie and Cronan (2000) show that the external factor of a company code of ethics along with ethics training and support is one that actually does have a great influence upon employees' behavior. Healy and Iles (2002), however, find the opposite effect in practice.

A deep understanding of all the factors that might influence the intention to behave ethically can help a company determine a strategy that will lead to improved ethical behavior and protection of their information systems environment as this becomes a greater focus among businesses (Grupe et al., 2002).

Technology as diffusion is the next subcategory of the proxy view and it also is found within IS ethics literature. The IS literature examines the process and extent of the penetration or acceptance of a given technology into a society or organization. IS ethics literature brings to light the ethics of that penetration and how it takes place. Accordingly, discussions revolve around the role of ethics in the evaluation of information systems (Ballantine et al., 2000) and in the decision to implement them despite possible quality problems (Tuttle et al., 1997). Most importantly, however, there is a focus upon the digital rights of both software developers and music producers that are involved in the diffusion of their products into society.

Classically, questions of intellectual property have dealt with the phenomenon of “softlifting” – using software that is illegally copied or unlicensed, a practice that is not

only engenders ethical questions but has clearly been deemed illegal in the United States (Grosso, 2000). The occurrence of this offense is reportedly very significant and proved through a survey to be very lightly considered by most offenders; yet, it is shown that “the process of IS diffusion in larger organizations will show a different level of ethical sensitivity” than in smaller organizations where there is a necessity for more education on the matter (Phoukan & Dillon, 2000). In fact, Christensen and Eining (1991) conclude that their subjects did not view software piracy as inappropriate behavior, nor did they believe that their friends and superiors consider it as such. In a study attempting to find an effective means of deterring the buying of pirated software, 81% of people surveyed admitted to committing the offense on a regular basis, with the most common offenders identified as male (Moores & Dhillon, 2000). In schools, older students are reportedly more frequent violators than younger students are (Sims et al., 1996) and IS faculty members are found to be more likely pirates than IS managers (Shim & Taylor, 1991). Another study shows that “software piracy is significantly correlated to GNP per capita, income inequality, and individualism” at the country level (Husted, 2000).

Many studies have attempted to understand the factors that lead to committing software piracy and what can be done as a result to prevent the offense (Christensen & Eining, 1991; Eining & Christensen, 1991; Glass, 1996; Gopal & Sanders, 1998; Logsdon, 1994; Peace et al., 2003, Seale et al., 1998; Simpson, 1994; Solomon & O’Brien, 1990; Swinyard et al., 1990). Moral judgment, situational variables, ethical perception, social norms, expertise required, demographic factors, culture, punishment severity, punishment certainty, software cost and computer usage and attitudes are among the factors tested in the above studies. Gopal and Sanders (1997) tap into some concepts from criminology as

they point out the importance of deterrent controls (threats of legal sanctions) for software piracy, which help increase software firm profits, as opposed to preventive controls (physical obstacles) which actually decrease profits. Noting that software price was found to be an important reason for pirating software, Cheng et al. (1997) point out that raising software prices would make piracy even more desirable. In the same vein, Gopal and Sanders (2000) suggest pricing strategies as a possible solution for the problem of softlifting as it manifests itself in the global realm. Conner and Rumelt (1991), however, suggest no technological protection from software piracy as the best policy for raising firm profits and lowering selling prices.

Much information has also been learned about the case of softlifting as it has been used as an anchor to learn things about more general IS ethics. Thong and Yap (1998) use the case of software piracy as a setting into which they apply a previously tested marketing ethical decision making theory to the information systems arena. They attempt to uncover the ethical judgments used in making softlifting decisions, finding that both deontological (belief that a set of universal rules define what is right) and teleological (belief that rightness or wrongness of an action is based on its consequences) methods are used to arrive at a decision. The case of softlifting is also used as the context for developing a construct measurement that can be used to help understand the role that ethical computer self-efficacy plays in people's ethical conduct related to computer use (Kuo & Hsu, 2001). Once more, a study of softlifting is used to suggest “a relationship between religion and the stages of an ethical decision making process,” finding that such a relationship in fact exists (Wagner & Sanders, 2001).

Most recently, however, the same diffusion ethics questions have also manifested themselves in the music industry morass, as the ethicality of freely sharing music among peers has been called into question. Several research studies explore the newly academic area of music file sharing as they identify probing questions about the ethics involved (Calkins, 2002), attempt to understand the file sharing systems users' perspective on the questionable activity (Lee, 2003), and compare and contrast it to software piracy (Bhattacharjee et al., 2003). Within the evolving management of such digital rights, Cohen (2003) calls for a recognition of the need for a balance with user privacy.

The final proxy through which technology is viewed in the IS ethics literature as well as in the IS literature is capital. The *technology as capital* view discusses technology in terms of the value of IT investments to firms, industries, or economies. One ethical consideration that arises in the area of investment in IT is regarding the current trend toward saving costs by outsourcing the development and support of software to offshore locations such as India and China (Greenhouse, 2003). What ethical obligation does the IT industry have to remain loyal to domestic workers and help prevent the relocation of jobs to foreign sites? Upon deciding to outsource, Lacity and Hirschheim (1993) remind managers about the ethical responsibility that they have toward their own employees whose jobs will be eliminated by the decision.

Ensemble View. The third view in the IS framework is the one in which IS is studied by examining the various forces that contribute to how the system came to exist in the form that it does. The most micro level of this type of view includes the instances where technology is studied from the perspective of the process that is employed to design, develop, and implement the system. Within these *technology as a development project*

instances, we once again find a section within the IS ethics research with the same focus. Many IS ethics studies have looked at the ethical issues involved in the information systems development process.

Though each step of the development process can involve ethical decisions, one work stresses the “hotspots” in which ethical questions are somewhat more likely, namely, defining the project goal, assigning people to tasks, and communicating project progress to all concerned (Rogerson & Gotterbarn, 1998). Others focus on the design of the actual product considering how it will be used, distributed, and the possibilities for its misuse (Wood-Harper et al., 1999). For example, in designing an information system such as a Web site, some feel, it is an ethical responsibility to accommodate the needs of users with disabilities (Dudley-Sponaule & Lazar, 2003). A developer will also stumble upon the question of which of the stakeholders’ conflicting interests to best comply with in the design of an information system (Klein & Hirschheim, 2001). In addition, uncertainty arises regarding the developers’ role in the potential, perhaps unethical, uses of the system under development (Johnson & Mulvey, 1995). Might the system being developed even persuade users to behave in a certain way (Berdichevsky & Neunschwander, 1999)? One work in this area deals specifically with the ethical and legal liability that software developers have in producing products that malfunction (Sipior & Ward, 1998).

A number of different development models exist whose goal it is to outline a successful set of guidelines to help systems analysts and project managers in their job of systems development. IS ethics researchers have found these methodologies too technical, rational, and internally oriented. Hirschheim and Klein (1994) analyze the methodology developed by Mumford, called ETHICS, pointing out the inclusion of human and societal

considerations into the development process. Rogerson et al. (2000) suggest modifications to the SSADM information systems development process making sure to take into account the relationships of people outside the organization to the end product. Rogerson and Gotterbarn (1998) go into further depth regarding this as they analyze who all the stakeholders of a given project might be, how to identify them, and how to get them involved in the development process. Wood-Harper et al. (1999) illustrate this stakeholder approach as they present an example of an ethically charged development assignment in which a development group is requested to create a system for an employment agency that will list prospective employees in order with consideration to their race, gender, and other attributes that are generally considered discriminatory in evaluation for employment. The authors stress that throughout the systems development process decisions must be made with a focus on the ethical perspectives of all the people involved. One paper in this area presents a novel technique in educating future information systems developers in the crucial area of ethics. Rather than submerge students only in the minutiae of the technical aspects of development they are also introduced to the interpersonal pieces of project development where potential conflicts can arise, learning how to solve ethical dilemmas that arise among development groups, in client relationships, and regarding the surrounding industry (Fielden, 1999).

The next subcategory of the ensemble view transports the systems development idea to a broader realm. *Technology as a production network* views the development of technology at the level of the international industry rather than at the level of the individual project. It looks at how technology is developed throughout the industry and across countries. Once again, a corresponding area within the IS ethics research exists. Parallel

to this line of research, IS ethics researchers have been looking at the ethical issues of the IS industry as a whole. Some authors have noted a vacuum in the technology industry as far as taking responsibility for unethical acts (Linderman & Schiano, 2001) and have sounded a call to the IT units to “create a structure for identifying and dealing with” ethical issues (Grupe et al., 2002) and to the individuals within to take action toward an ethical IS society (Rogerson, 1995).

In answer, studies have looked at the creation of codes that emphasize ethical behavior in the information systems industry, the responsibility of enforcing such rules, and their effectiveness in promoting ethical decision making (Anderson et al., 1993; Harrington, 1996; Kreie & Cronan, 2000; Pierce & Henry, 1996). An active researcher in this area, Effy Oz (1993), presents a thorough analysis of the four major codes that exist within the industry (the codes developed by the Data Processing Management Association, the Institute for Certification of Computer Professionals, the Association for Computing Machinery, and by the Information Technology Association of America), pointing out their flaws and suggesting some ways to improve them. The analysis is done using Deborah Johnson’s (1985b, page 26) suggestion that professional codes of ethics fulfill obligations to society, to employer, to clients and to colleagues and professional organizations. Anderson et al. (1993) demonstrate concrete applications of the ACM codes in a series of case studies that illuminate the potential use of the codes in nine ethically questionable situations. In another work, Oz (1992) proposes a way of combining the four separate codes into one coherent code that the information systems community can rely upon internationally to guide professionals in their ethical behavior. The challenge inherent in

this task, however, is reiterated as Healy and Iles' (2002) report on the ineffectiveness of codes of conduct in influencing end user behavior in 125 London-based organizations.

Technology as an Embedded System is the IS subcategory of the ensemble view that studies how technology and the use thereof is influenced by the social, historical, cultural, and political context in which it is found. One type of work done in the corresponding IS ethics literature relates to the study of ethical attitudes toward IS in the global realm. This can be exemplified by the study carried out by Whitman et al. (1999) examining the computer-use ethics among nine different countries. The study uses scales that measure attitude toward a number of various computer abuses and finds significant differences in the ethical values among nationalities. Milberg et al. (1995 & 2000) execute a similar study in which they compare the personal information privacy concerns and cultural values among different nationalities. They find a relationship between differences in these constructs and differences in information privacy regulation among those countries. In their global study, Swinyard et al. (1990) examine the significance of different cultures on the intention to pirate software. Similarly, in a study of worldwide governments' incentives to enact and enforce copyright laws Gopal and Sanders (1998) also seek to understand if the determinants of software piracy transcend cultural barriers. More specifically, Eining and Lee (1997) note that the American perspective in most ethical situations is more rule-based than the relationship-centered one of their counterparts in Chinese cultures. By way of solution to the global software piracy problem, Gopal and Sanders (2000) suggest that there is a correlation between income levels and piracy and individual pricing strategies in different countries would alleviate some of the piracy that is occurring globally.

Another globally-oriented IS ethics discussion that is relevant to the ethics of the interaction between society and technology is that of access to computers and the digital divide. As power is increasingly associated with access to information and information technology, the discussion of equal access to technology in society is ethically significant (Johnson, 1985a; Mason, 1986). The reportedly widening gap between those who do and those who do not have access to computers and the Internet, is an obvious place for the application of ethics (Hacker & Mason, 2003) and Oddo (2002) conducts an analysis of the phenomenon. Moss (2002) analyzes the concept of the digital divide as it applies to political ethical dilemmas while Camp & Tsang (2000) discuss the possibility of universal service in an attempt to close the divide.

The final subcategory within the IS research framework is that of *technology as structure*. In this category, researchers focus on the way that users interact with the social structures that have supposedly been built into information systems by their designers. The IS ethics view of this area will concentrate on how society and its interaction with information systems help to create an information systems ethics standard. From this perspective, the concept of “rejection of technological determinism” introduced by Laudon (1995) is appropriate as part of a corresponding line of work. In it, Laudon brings to light the idea that although blanket statements are made regarding what information systems “cause”, there is in essence an interaction between the systems and society that mediates those outcomes. “Societies do not stand naked before technological change, swept along before the tide...” Rather, an understanding of how information technology and society interact is essential to the formation of an information systems ethics (Laudon, 1995). In a slightly different vein, Conger and Loch (1995 & 2001) try to explain the social norm

development that occurs in society regarding the ethical use of computer systems based on *Integrated Social Contracts Theory*. They claim that the development of the social norms that define ethical behavior in using information systems is a result of a complex process in which individuals discuss ethical dilemmas within their context eventually determining what will become the norm.

Computational View. The final view within IS research is the one that does not deal with any aspect of human interaction with computers. Rather, the computational view includes the works that develop and describe specific algorithms or models that can be implemented to demonstrate the capabilities of the computer or to simulate some phenomenon. The IS ethics issues that might come into play in this are those that fall into Mason's accuracy category (Mason, 1986) or into Johnson's 'liability for malfunctions in computer programs' category of IS ethics (Johnson, 1985b, page 39). In the development and introduction of these algorithms and models, has care been taken to eliminate all possible malfunctions (Sipior & Ward, 1998; Wahl, 1994) such as those that might have arisen in the year 2000 (Kappelman & Cappel, 1999)? Has all the data and information involved been verified for accuracy (Mathieu & Woodward, 1995)? Has any bias been built into the logic that runs the program or model (Wood-Harper et al., 1999)? In their discussion about the systems designers' responsibility in the use of the decision support systems they create, Johnson and Mulvey (1995) bring up this point. They cite an example where a specific financial strategy is implemented within a broker's program. The discussion that ensues stems off of the question of who is responsible for the outcomes of the financial decisions that are made using that system. A similar example is the one related to the airline booking system, SABRE, created by American Airlines that

implements a bias toward their flights on their own aircraft. In the development of algorithms for proof of concept or any other purpose, the particular implementation used to achieve the goal is an area rich with potential for ethical dilemma. The program is never objective as it is infused, purposely or by chance, with the viewpoint or comprehension of the developer. Thus, the consequences of its use can potentially prove to be a playground for the tossing back and forth of ethical responsibility.

Orlikowski and Iacono's final category, the Nominal View, in which technology plays only a nominal role, will not be included in this framework, as by its very definition "technology is essentially absent" from the studies in this group. It is therefore inappropriate to define IS ethics research by mapping it to an area of research in which IS has no significant role.

<Insert Table 2 about here.>

CONCLUSION

The diversity of the IS ethics field has become quite apparent through the present review exercise. Exploring the IS ethics research body as a whole has drawn attention to studies that are applicable to different types of people and issues that are viewed from many various angles. It has illustrated research works that have different types of goals including defining IS ethics, determining its uniqueness, ascertaining types of ethical situations and their causes and solutions. It has highlighted some studies that focus on construct and measurement development to encourage future rigorous research in the field while others analyze a philosophy of what is needed in the creation of an IS ethic. Most

notably, the review of IS ethics literature has shown that coverage of the topic considers the perspectives of many various IS personalities – the user, the developer, the manager, the IS professional, and the IS industry – that interact with computer systems in a wide variety of ways.

As does any framework of a research field, the current classification provides an organized structure with which to sort through the diverse types of studies that have been conducted and theoretical works that have been written in a vast research area. Although other classification schemes have been illustrated for the IS ethics literature, the structure developed here is different from any of the previous frameworks. This framework examines IS ethics with IS as a focal point, creating two advantages. Firstly, it aids in solidifying the otherwise vague boundaries of what IS ethics is comprised of. Prior to the IS-centric ethics framework at hand, the multitude of outlooks regarding what is included in IS ethics and how it can be conceptualized could have left researchers feeling overwhelmed and disoriented. However, grounded by IS itself, the new framework affords researchers an instrument through which to obtain a clear focus and understand how ethics issues really relate to IS and its component phenomena. By navigating the IS ethics literature using the same map that has been used to traverse the IS literature base, the framework explicitly identifies the ethics literature that overlaps with IS literature, examining the ethical issues involved in each of the IS categories of study that views technology from a different vantage point. Secondly, being so closely tied to the well-known framework describing the IS research space, the new framework promises to accommodate the field as it develops and is expanded by additional issues. Because the framework is directly related to the different aspects of its reference field, it will prove to

be dynamic as even revolutionary new issues that arise will fit neatly into the categorization based on their relationships with IS.

Additionally, Orlikowski and Iacono's framework does even more for IS ethics than organize it in a manner that is grounded in IS. Of all classifications of IS, theirs is an especially appropriate match for IS ethics research because it covers all the diverse perspectives from which questions of ethics can arise in the interaction with computer systems, addressing each of the questions that underlies IS ethics research. For each group of people who interacts with computer systems there is a framework category in which its ethics-related curiosities converge:

From the **user** perspective the question underlying IS ethics research of interest is *what?* What quandaries come about during the use of computers for all their different purposes? What are the potential abuses, crimes, and privacy invasions to be wary of that can be committed using computers? Responses to these questions, clearly, are found in the tool view category. While this category in IS represents those research works that address what computers are used for, it is paralleled in IS ethics as it details the ethical concerns involved with specific computer uses and the malicious activities for which computers can be used.

Developers of information systems, however, want to know *how?* How are the unethical uses of computers that are to be prevented being programmed into and associated with the systems they build? Where the computational view category tells the IS community how computers are built to meet people's needs, it tells IS developers the ethical responsibilities involved in this creation of computer systems.

From yet another perspective, business **managers** and managers of IS who supervise users and developers ask *why*? Why is it that people partake in unethical computer use? Why do they adopt and use technologies ethically or unethically? The proxy view category, the one that addresses the perception and diffusion of IS, addresses for IS ethics the personal and situational factors that effect the ethicality of individuals' adoption and use of, and investment in technology.

Finally, the **IS industry** is made up of **IS professionals** who are responsible for the trends that arise in computer use and development and ask, similarly, *why*? Why is the current state of ethical activity the way it is at each level of generality of scope? Why have computer systems, industry infrastructure, cultural systems, and social norms come to incorporate or address the ethical issues that they do? In answer, the ensemble view, which in IS discusses how computer systems and the IT industry came to be the way they are, focuses in IS ethics on the ethics of that development and why ethical trends and norms are the way they are, including suggestions of what might be done to improve them.

Thus we see that having an orderly framework through which to view the literature affords us with the opportunity to understand the types of work that have been done as well as the perspectives from which they are initiated and their underlying research questions. Doing just this, our new framework also serves as the roadmap for future research work. The current framework acts as a tool to help focus the thoughts of researchers who are exploring or entering the field of IS ethics upon what type of questions they are interested in asking and from whose perspective they will study. Certainly, however, no individual is a one-faceted member of the IS community. There is no manager who is not also a user of computer systems; There are a plethora of developers who consider themselves influential

in the IS industry; etc. For this reason, the framework at hand benefits the study of IS ethics even more by encouraging the conceptualization of mixed-role individuals. The framework facilitates a fruitful source of research quests by allowing for the addition of this new dimension within the flat classification. Using the work done in a given area to enhance another is an obvious way to reflect the reality of the multi-faceted nature of people in the IS community. For example, borrowing from the proxy view, a managerial perspective of some factors that influence the ethicality of employees' behavior might be abstracted and examined in the broader context of the IS industry from the 'ensemble' point-of-view. Perhaps the developer/computational view can be matched with the IS professional/ensemble perspective and research can be done on ways of building industry-wide controls and standards into the systems that are created. It is possible that a researcher would combine the tool and proxy views to assess how perceptions of ethicality differ among the various uses and misuses of computer systems.

Furthermore, as a research tool, the framework is also instrumental in pointing out the distribution of research efforts that have been contributed throughout the field thus far. Having completed an inclusive review of the IS ethics literature we can see that the two most researched areas, by far, are the issues of information privacy and software piracy. Secondary focus is on the unethical behaviors that crop up in other individual computer uses and the factors that influence these behaviors. While all these issues are relevant, important, and widespread – especially in this post-terrorist and customer-centric era – they fall only into parts of the tool and proxy views. This is a clear signal to the research community involved with IS ethics that it is failing to maintain the crucial comprehensive connection with the essence of IS. The areas that have gotten the most attention from

researchers would be more appropriately collectively titled *computer* ethics than *IS* ethics. Researchers, for the most part, seem to have a very shallow understanding of the IS field, addressing in its related ethics area only the most basic levels of what computers do (collect information), what individuals do with computers (run software), and what drives us to do these things ethically. The literature review has shown that the IS ethics research as a whole does not display a genuine understanding of how information systems truly infiltrate all the parts of society. Missing from IS ethics literature is a stronger emphasis on more broad IS trends. Are there perhaps any ethical dimensions involved with the impacts that IS has had on the structure of organizations, the workings of financial markets, the availability of information to consumers, the depersonalization of retail transactions, the social and political atmospheres, international relationships, the challenges to education... ? Although, as we have seen, IS ethics corresponds to a large and diverse portion of IS research, future researchers of IS ethics should probe deeper into the intricacies of IS and link IS ethics with a more complete picture of information systems and the various ways in which they are viewed.

Table 2: An IT View Based Framework for IS Ethics Research

<i>Tool View</i>	Labor Substitution	Deskilling	PA95; CO99; GR94; WE97
	Productivity	employee monitoring, telecommuting	KA93; LO98; HA99; SC98; MO00; HA94; SI98; GU97; WE97
	Information Processing	Information privacy: for marketing on the Internet in HR systems for employee monitoring - personal characteristics - technology setting characteristics - information characteristics Privacy Regulation	CL88; DA03; HO99a; WH01; BE02; ST02; TU03; BL94; FO93; MI00; SM99; WA98; BE99; CH02; Cetal99; ED99; FU80; HU98; TA89; CA95; SI95; WE95; HA99; HA94; LO98; MO00; SC98; ST83; CU93; MI95; CU99; LO96; ON01; MA96; HS03; HA02; CU99; GR02; HO99b; WA99; LA96; GO91; SM96; Mlatal00; CL99; CU00
	Social Relations	e-mail issues (privacy, spam, viruses) Internet – cyberstalking, defamatory language, censorship, filtering, ISP liability Decision-making using DSS	CA95; SI95; WE95; S,W,&R98; SP99; CE89; CH89; GO95; GA99; WH99; TA02; T&G02; LI02; TH99; JO97; VE01; SA03; RO01; WE00; SC03; MO01; C&W00
<i>Proxy View</i>	Perception	factors that influence intention to act ethically or unethically in acceptance and use of technologies	LO96; FO02; GL96; LO94; PE03; SE98; SI94; SO90; CH91; BA98; HS03; BA96; GA99; KR98; KH95; PE97; KU01; TH98; PI00; HA96; KR00; HE02; GR02
	Diffusion	Software piracy, decision to adopt IS, IS evaluation, music file sharing	BA00; TU97; GR00; PH00; CH91; M&D00; SI96; SH91; HU00; EI91; GL96; GO98; LO94; PE03; SE98; SI94; SO90; SW90; GO97; CH97; GO00; CO91; TH98; KU01; WA01; CA02; LE03; BH03; CO03
	Capital	Outsourcing	LA93
<i>Ensemble View</i>	Development Project	Systems development process; design, potential uses, and malfunction of software	RO98; WO99; DU03; KL01; JO95; BE01; S&W98; HI94; RO00; FI99
	Production Network	Industry wide calls for action and codes	LI01; GR02; RO95; AN93; HA96; KR00; PI96; OZ93; JO85; OZ92; HE02
	Embedded System	cross-cultural studies; digital divide	WH99; MI95; MI00; SW90; GO98; EI97; GO00; HA03; JO85a; MA86; OD02; MO02; CA00
	Structure	Development of social ethics norms	LA95; CO95; CO91
<i>Computational View</i>	Algorithms	Quality/Y2K, usage implications, embedded values	MA86; JO85b; S&W98; KA99; MA95; WO99; JO95
	Models		

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