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Foundations and Trends® in Information Systems

Published, sold and distributed by:
now Publishers Inc.
PO Box 1024
Hanover, MA 02339
United States
Tel. +1-781-985-4510
www.nowpublishers.com
sales@nowpublishers.com

Outside North America:
now Publishers Inc.
PO Box 179
2600 AD Delft
The Netherlands
Tel. +31-6-51115274

The preferred citation for this publication is

D. Paradice, D. Freeman, J. Hao, Joonghee Lee and D. Hal. *A Review of Ethical Issue Considerations in the Information Systems Research Literature*. Foundations and Trends® in Information Systems, vol. 2, no. 2, pp. 117–236, 2018.

ISBN: 978-1-68083-399-7
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Volume 2, Issue 2, 2018

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Foundations and Trends® in Information Systems, 2018, Volume 2, 4 issues. ISSN paper version 2331-1231. ISSN online version 2331-124X. Also available as a combined paper and online subscription.

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A Review of Ethical Issue Considerations in the Information Systems Research Literature

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ABSTRACT

This monograph summarizes the treatment of ethical considerations that have been made by information systems researchers as reported in papers published in the Association of Information Systems Senior Scholars Basket of Journals. These eight journals, the first of which was published in 1977, contain 145 papers that are summarized in sixteen categories. When examined in this fashion, we find that information systems research over the years that incorporates an ethical perspective has transitioned from a focus on codes of ethics and general notions of behavior to more sophisticated models of piracy, privacy, and security. There has been a steady focus on theory development over the last ten years, as well as constant scrutiny on the obligations of information system researchers to both the subjects of studies and the consumers of the research results.

David Paradice, David Freeman, Jianliang Hao, Joonghee Lee and Dianne Hall (2018), "A Review of Ethical Issue Considerations in the Information Systems Research Literature", Foundations and Trends® in Information Systems: Vol. 2, No. 2, pp 117–236. DOI: 10.1561/2900000012.

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The monograph begins with a brief introduction and review of major ethical theories. This is followed by the category summaries, which are listed in alphabetical order to enable a reader to jump to a specific topic. The last sections of the monograph address future research opportunities and the conclusions we draw. These sections include topics from the papers published as well as our own suggestions for research that examines ethical concerns in the increasingly networked world in which we live.

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1

Introduction

The idea that ethical issues need to be incorporated into technology-based research pre-dates the emergence of the modern information systems research discipline. C. West Churchman, the first editor of *Management Science*, maintained an enduring sense that ethics and technology should be combined for improvement of the human condition. For Churchman, a science of management should include all aspects of improving how the world functions, including management of resources and using the systems approach to solve the most complex problems (e.g., poverty, illness, and injustice, see Porra (2001)). According to the Encyclopedia of History of American Management (Witzel, 2005), Churchman believed systems thinking and ethical alertness were entwined. He believed that a moral and ethical stance should be integrated into management practice and thinking; it should not be an afterthought. Churchman believed improving a system involved the ethics of the whole system (Churchman, 1968).

One of Churchman's students, Richard Mason, observed in the mid-1980's that society was truly an information society and that "our time (is) an information age" (Mason, 1986). He noted that "information forms the intellectual capital from which human beings craft their lives

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and secure dignity" and that the management information systems (MIS) community should be concerned for the type of society that was being created, given that MIS professionals are at the forefront of this creation.

Mason recognized that many issues would need to be addressed, but he identified four issues of particular concern: privacy, accuracy, property, and accessibility (which he referred to by the acronym PAPA). Through a series of anecdotes and vignettes, Mason gave life to the significant problems that can occur for individuals when each of these aspects of information is mishandled. He summarized this opinion piece with the following moral imperatives:

1. Information systems should not unduly invade a person's privacy.
2. Information systems must be accurate.
3. Information systems should protect the intellectual property of individuals as well as the infrastructure through which the information flows.
4. Information systems must be accessible by all to ensure ability to participate in society.

Mason noted that fulfilling these moral imperatives is a "tall order", but one that the MIS community needed to address.

Mason's work was purely anecdotal, but a number of quantitative and qualitative studies have since been published. This review examines how the information systems research community has responded to Mason's vision. We review how information systems researchers have integrated ethics and ethical considerations into the knowledge they have created.

Following brief sections that define the most common ethical theories and the methodology employed, the rest of this work is organized in alphabetical order by research topic. The reader who chooses to jump to a particular topic of interest is cautioned, however, that the nature of examining ethical issues is complex and thus placing a paper in a single topic category can occasionally be challenging. For example, Wall *et al.* (2016) states that "Privacy and security concerns are pervasive . . . "

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which begs the question: should the paper be categorized under "privacy" or "security"? Similarly, Siponen *et al.* (2006) describe a design theory framework for secure information systems. Should this be in the "design" section or the "security" section? Thus, the reader who is not inclined to read the entire review is encouraged to think broadly if searching for coverage of a particular ethical issue context.

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2

Ethical Theories

Two very common ways of classifying ethical theories are as deontological ethical theory or teleological ethical theory. A deontological ethical theory is an ethical theory that places special emphasis on the relationship between duty and the morality of human actions. In deontological ethics, an action is considered morally good because of some characteristic of the action itself. The focus is not on the outcome but rather on the action. For example, if a person feels that killing another person is unethical, regardless of the circumstances, then that person is following a deontological form of ethical reasoning. An example using deontic reasoning to build an expert system is presented in Lee and Ryu (1995).

Conversely, a teleological ethical theory places emphasis on the outcome, or consequence, of the theory. Teleological ethical theories are also known as consequentialist ethical theories (or more generally as consequentialism). If a person can accept (indeed, require) that a person be killed if killing the person will save the lives of others, then that person is following a teleological form of ethical reasoning. The consequence in the second case justifies the action. Consequentialism can be further refined into many variants. Two common ones are egoism

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and utilitarianism. Egoism is an emphasis on how the consequences relate to the good of the decision maker; utilitarianism is an emphasis on the good of the community. Utilitarianism is often referred to in discussions relating to information security or privacy (e.g., Siponen and Iivari (2006)).

Berente *et al.* (2011) offer another interesting example in the discussion of teleological and deontological ethical perspectives. They note that in the rigor versus relevance debates in the IS discipline, rigor is related to the obligations of the researcher (a deontological assessment), while relevance (a teleological assessment) is related to the outcome of the study for the IS community. The IS researcher has an obligation to balance these two perspectives. (We review Berente *et al.*'s work further in the section on researcher responsibilities.)

A few other ethical theories surface on occasion. A rights-based theory of ethics holds that there are some rights that are held by people by virtue of them being human. Examples of these rights are freedom from slavery, freedom from torture, and equality of treatment. A person guided by considerations such as these is following a rights-based ethical theory. Virtue ethics is a broad term intended to emphasize the role of character and virtue of the decision maker. Casuistry (from the Latin word for "case") is a method of reasoning by which one compares a problem situation to a paradigmatic case in which the ethical choice or decision is clear. Ethical relativism is the idea that nothing is objectively right or wrong. The prevailing sentiment of the times (or community) dictates ethical choices and actions. Postmodern ethics rejects the universality of other ethical theories. In fact, the postmodern perspective argues that the aim of ethics is not to provide overarching principles; rather, it is to improve situations in local contexts. (For more on postmodern ethics, see the section below on design.)

Stahl (2012a) provides an excellent review of the ethical theories used in IS research. He further develops a model of normative issues using the term "normativity" rather than "ethics" or "morality" or "law". He takes this approach in order to capture an overarching concept (normativity) which captures the notions of these other words as well as "values" and "worth". His work develops a model that contains four

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levels: moral intuition, explicit morality, ethical theory, and reflection and meta-ethics. These four levels are mutually dependent, but the levels should not be interpreted in a way that concludes one level is "better" in any sense than another level. The levels capture the frequency with which certain issues arise and the level of abstraction involved at that level. We include papers in this review regardless of the underlying ethical theory. Our methodology is described in the next section.

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3

Methodology and Macro Analysis

There have been thousands of papers published that, in some manner, investigate some interplay of ethics and information systems. For example, a search of the *Journal of Business Ethics* (1987 – present) for the term "information systems" returns over 4,200 relevant papers. The first challenge in a review such as this is to identify a "reasonable" set of papers to examine, which, of course, leads to the issue of defining "reasonable." Our goal is to examine how information systems researchers have studied issues of ethics, which is certainly a different goal from examining how ethics researchers grounded in philosophy or theology or law have studied ethical issues involving information systems.

Given our desire to have an information systems research perspective, we chose to limit our review to papers published in the Association for Information Systems (AIS) Senior Scholars Basket of Journals. These eight journals have been identified as the top journals in the information systems research field. They are focused in information systems (i.e., they are not multidisciplinary) and they have been chosen as representative of the breadth of research topics studied in information systems research. By design, they capture "topical, methodological, and geographical diversity". They have rigorous review processes and their

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editorial boards are widely recognized as the best scholars pursuing information systems research. These journals publish research that is created and read by an international audience. The journals in the "basket" are:

- *European Journal of Information Systems*
- *Information Systems Journal*
- *Information Systems Research*
- *Journal of the Association of Information Systems*
- *Journal of Information Technology*
- *Journal of Management Information Systems*
- *Journal of Strategic Information Systems*
- *MIS Quarterly*

Online repositories for the Basket of Journals were searched for articles using the stem words "ethic" and "moral". In addition, we were careful to include the top 50 papers in Topic 95 of the online text analysis of the content of the journals in the basket (see the AIS website for more information about this analysis). Topic 95 groups papers containing the following keywords: ethical, piracy, ethic, moral, legal, pirate, justice, individual, law, and behavior. This approach yielded an initial pool of well over 200 papers. The text of each of these papers was searched for the word "ethic" to determine whether the word appeared only in the phrase "work ethic" or only in the title of a paper or book referenced in the article. If either of these cases were true, the paper was excluded from this review. Similarly, the text of each paper was searched for the word "moral" to determine whether that stem only appeared in the word "morale". If that was the case, the paper was excluded from the review. On occasion, a paper would be added to the pool of papers that was published in a journal that is not in the AIS Senior Scholars basket. This occurred when additional background reading was deemed necessary. The final pool of papers included over 150 papers determined

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to be relevant to this review. However, our reference list also includes papers cited in the papers we read when those (additional) papers are cited in this review. The final reference list contains approximately 200 references. We encourage the reader to also explore *Communications of the ACM, Information and Management*, *Decision Support Systems and Electronic Commerce*, and the *Journal of Business Ethics* (among others) which are known to include information systems research that examines ethical issues.

We read each paper in our pool and categorized it by the context of the study (e.g., privacy, security, etc.). A summary of the paper was written in an attempt to reduce the content of the paper to a few paragraphs that would convey the essence of the paper. We then aggregated these summaries into groups based on the context.

What follows are the summaries, further edited (from our initial readings) to provide a review of the literature examined. The remaining sections are in this order:

- Behavior/Decision Making
- Calls for Research
- Codes of Ethics
- Design
- Ethics as a Classification Category
- Government
- Identity
- Innovation
- Piracy
- Planning
- Privacy
- Researcher Obligations

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- Security
- Teaching Case
- Theory
- Trust
- An Agenda for IS Research

Having summarized over 150 articles, it can be insightful to examine the overall development of the research topics, which areas have received the most attention, and where the research has been published.

We begin by noting the year in which each journal was first published. *MIS Quarterly* began publication in 1977. It was followed by *Journal of Management Information Systems* in 1984 and *Journal of Information Technology* in 1986. Information Systems Research was first published in 1990, followed the next year by *Information Systems Journal*, *Journal of Strategic Information Systems*, and *European Journal of Information Systems* in 1991. The *Journal of the Association of Information Systems* was first published in 2000. From 1977 through 1994 (which is pre-JAIS), only seven articles were published that are summarized in this review. Three of these papers are focused on codes of ethics, one on design and one on general behavior. Mason's [1986] paper that outlines important issues and a paper that uses ethics as a classifying tool round out this group.

Over the next seven years, from 1995 through 2001, twenty-three papers were published that fall into twelve of the categories that emerged from this analysis. Three or more papers were published in five of these seven years, indicating more attention being given to ethics (in general) and more exploration of ethics topics across the IS spectrum of research. During this period there is greater investigation of ethical decision making behavior (five papers) and we begin to see piracy emerge as a focus area (four papers). The other ten categories are represented by no more than one or two papers during this period. Notably, this period is the time when networked systems and the Internet are emerging as technological forces in business as well as our personal lives.

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From 2002 through 2015, we see interest in ethics research become much more common. Over 125 papers are categorized in this period, with at least one paper in every category that we identified. Leading the way in terms of quantity are theory development and the obligations of researchers, two areas in which one might expect to see focus in an academic community that highly values research. We also see more studies in the areas of piracy, privacy, and security. As noted earlier, these are highly related areas. Piracy and privacy concerns often occur where inadequate security exists. We see the earlier general focus on ethical behavior/decision making being investigated in more specific contexts.

At a macro level, we can almost describe the ethical development of the research in terms of Kohlberg's (1969) stages. In the early years, the field is focused on self-interests (i.e., analogous to Kohlberg's pre-conventional thinking?) such as what defines the field (e.g., frameworks) and how to be accepted (e.g., user satisfaction). More recently, we see the field considering topics of wider reaching concerns such as piracy, privacy, security, and theory (i.e., analogous to Kohlberg's post-conventional thinking?). A heat map of the number of articles published annually since 1977 shows a generally increasing number of articles per year, with over one-third of the articles published after 2010. However, we were unable to access articles in the last five years in an online format for ISR, so our analysis is probably conservative.

We also draw attention to the categories that we identified, but which have few papers in them. A paper focused on codes of ethics has not been published in these journals in over decade. The various societies for information systems professionals have been in existence for some time, so the development of each society's code has long since passed. Additionally, more recent research now tends toward other factors, such as deterrence and procedural justice mechanisms as factors influencing behavior. Design is another category that has not been examined recently. Agile design processes involve users, so perhaps information systems researchers are inclined to believe that agile design processes automatically empower users in ways that older design methodologies did not.

We find it interesting that there are few papers in the government category and the identity category. Municipal systems are becoming

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much more digital and municipal databases are being developed that have the capability to maintain extensive information about citizens. Ethical government function from an information systems perspective could be a very ripe area of research. Similarly, the digital identity of citizens (i.e., the LinkedIn profile, the Facebook profile, and so on) is becoming the public "face" of many. The ethical treatment of people in light of the data they share in these public spheres is an area rich in potential investigation.

We hesitate to draw too much from the data in terms of articles published per journal, because special issues of journals can bias the interpretation of the data. However, we will note that the two oldest journals (*MIS Quarterly* and *Journal of Information Technology*) and the *European Journal of Information Systems* have published almost 60% of the articles. Aside from noting that these three journals have published most of the articles we classified as pertaining to the obligations of researchers, we are hard-pressed to identify any other way in which they are distinguishable as a group from the other journals included in the analysis.

A table summarizing the papers referenced in each section appears as an Appendix to this work.

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4

Behavior/Decision Making

There are a number of studies that examine (un)ethical behavior. Some of these studies could be considered under other headings, because the context used to study the behavior was focused in a particular way (e.g., scenarios involving software piracy). We will make note of those situations as we discuss the studies.

Behavior is often guided by general beliefs. For example, if a person believes "the customer is always right", then the person is likely to make choices in situations that are different from the ones chosen if a person believes "the stockholder's profit is always most important." Smith and Hasnas (1999) examine these considerations and present three normative theories of behavior that can be considered in business. Stockholder theory holds that management is beholden only to the stockholders of the organization. Under this theory, management acts ethically when it acts to maximize stockholder return on investment. Stakeholder theory holds that a wider range of stakeholders exists beyond stockholders. Under stakeholder theory, management must consider the impact of decisions on customers, suppliers, and others when making a decision and acts ethically only when the interests of all stakeholders is considered. Social

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contract theory states that managers should increase the social welfare above what it would be without the existence of the firm, without violating basic canons of justice.

Smith and Hasnas argue that none of the three theories is adequate. Managers face situations in which different theories make more sense at different times. However, fundamental to all of these theories is that each holds for all ethical situations, so it is inappropriate to use different theories for different situations. The only alternatives ethically available to managers are to adopt one of these theories and stick with it, modify one of these theories in a way that can be logically defended, or create a new normative theory of business ethics.

Luftman and Zadeh's research (2011) was slightly more focused, but still quite general across IS issues. They conducted a survey of senior IT executives from over 472 organizations. Their work identifies the top ten IT management concerns and the top five applications and technology investments. According to their results, IT executives are concerned mostly with issues such as business productivity and cost reduction, IT and business alignment, business agility and speed to market, business process management and reengineering, IT reliability and efficiency, and so forth. The top five IT investment areas were business intelligence, cloud computing, ERP systems, software as a service, and collaborative and workflow tools. When asked about future expenditures, the respondents indicated "there is an anticipated growth in education and training focused on interpersonal (e.g., writing, presentation, and negotiation skills, and ethics/morals), and business/management skills" (Luftman and Zadeh, 2011, p. 200).

A "Domains of Morality" approach was taken by Gattiker and Kelley [1999] to determine a user's feelings about certain computer-related behaviors. Vignettes were used to gather the information from users for the empirical study. The research had several objectives:

1. Determine if respondents' assessments varied among the three domains of morality (personal domain, conventional knowledge domain, and moral domain) when ethical dilemmas involving computer technology were included in the vignettes.

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2. Determine if demographics (age, sex, computer use level, etc.) affected the respondents' moral judgements.

3. Determine if moral domain varied based on socio-economic status.

These researchers developed five "probes" to gather data from their subjects. A "permissiveness probe" was developed to determine whether respondents felt a behavior in the vignette was wrong. A "bothered probe" was used to similarly determine whether respondents were bothered by the behavior described in the vignette. A "harm probe" was developed to determine whether respondents felt a behavior was harmful. An "interference probe" was developed to determine whether a respondent felt the action in the vignette was the actor's own business or whether outside interference was appropriate. Finally, a "universal probe" was designed to determine whether a respondent felt an action was universally (i.e., across cultures) acceptable. Results showed the vignettes for the three domains of morality were perceived differently on these various dimensions. These researchers conclude that a better understanding of the moral development of the growing number of computer users, especially with respect to the social transgressions committed by some, will guide future research on ethics, and policy development.

This result is consistent with the findings of Bannerjee *et al.* (1998) who found that an IS employee's intention to behave (un)ethically was strongly related to the context of the situation. These researchers tested a theoretical model containing constructs such as moral judgement, attitude toward ethical behavior, and personal normative beliefs, yet they discovered that "the most important variable in explaining ethical behavior intention was the organization-scenario variable – a variable added to control the analysis – rather than the proposed, theoretical, independent primary, or moderator variables" (p. 46). Leonard and Cronan (2001) confirmed and extended Bannerjee *et al.*'s results in a larger study of student subjects. They found additional significant characteristics that explain the intention to behave ethically are ego strength, gender, and relative preference for principled reasoning over conventional and pre-conventional reasoning. Similarly, Tuttle *et al.*

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(1997) found that the existence of a moral hazard in a decision context influenced IS professionals' decisions to implement a system with quality problems. They found IS professionals would act in their own self-interest (i.e., against the interests of the firm) when superiors had less information or understanding about the quality issues in a system and a financial incentive existed (for the IS professional) to implement a system on schedule. These results are predicted by agency theory.

Sojer *et al.* (2014) state flatly, "Programming is riddled with ethical issues." They investigated the inappropriate use of Internet-Accessible Code (IAC), i.e., code that is readily available on the Internet. The primary research question focused on why individuals would unethically reuse code that was freely accessible on the Internet. They developed a theory based on the Theory of Planned Behavior (Ajzen, 1991), selecting it over Hunt and Vitell's (1986) theory on the basis of higher explanatory power. Like Hunt and Vitell, however, they incorporate deontological and teleological perspectives in their decision making model. Their model draws on expected utility theory and deterrence theory to weigh the benefits and costs (respectively) of the choice to reuse code ethically. These aspects capture the teleological perspective. Their model draws on laws, professional codes, and policies to capture the deontological perspective. They also integrate "work climate" theory to capture social norms.

The subjects in this study were 869 professional software developers who responded to a survey after reading two vignettes describing use of Internet Accessible Code to fulfill a job requirement. In the first scenario, the person does not check thoroughly for applicable licensing obligations. In the second scenario, the person checks for obligations but knowingly ignores them. The results indicate developers' attitudes toward unethical IAC reuse positively affects intention to engage in such behavior and developers' subjective norms concerning unethical IAC reuse positively affects intention to engage in such behavior. The more a firm's ethical work climate emphasizes compliance with laws and codes, the lower developers' subjective norms will be supporting unethical IAC reuse, but the same is not true for compliance emphasis on firm rules. Time pressure has a positive impact on unethical IAC reuse, but perceived usefulness and higher perceived costs of compliance

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had positive impacts on unethical IAC reuse only in the first scenario. Perceived punishment for the firm and the individual had a negative impact on unethical IAC reuse, but perceived certainty of punishment was not significant in either scenario.

In a study that could be considered a study of "security" or "piracy" because the scenarios used, Chatterjee *et al.* (2015a) undertook an exploratory study of unethical information technology (IT) use, which they defined broadly. The term, as they use it, includes activities such as hacking, piracy, phishing, and spoofing. They reference Mason's (1986) work to define unethical IT use as "The willful violation – by any individual, group, or organization – of privacy, and/or property, and/or accuracy, and/or access – with respect to information/information goods residing within or part of an information system, owned/controlled by any other individual, group or organization." They use the Theory of Planned Behavior (TPB) (Ajzen, 1991; Fishbein and Ajzen, 1975) to build a nomological network model. The model incorporates technological idealism, technological relativism, and moral intensity as they are related to attitude toward unethical IT use. It also includes perceived non-traceability, computer self-efficacy, and perceived technological facilitation as they are related to perceived behavioral control. Finally, they relate attitude toward unethical IT use and perceived behavioral control to intention toward unethical IT use. They included subjective norms, past behavior, perceived lack of punishment, and perceived overall gain as other important factors.

They developed scenarios for a $2 \times 2 \times 2$ between subjects design in which there were two base scenarios (downloading music and changing an online grade), two levels of non-traceability (high and low), and two levels of lack of punishment severity (high and low). 493 business school students participated in the study. The data was examined for linear and non-linear relationships. A linear analysis revealed relationships between all factors except technological idealism with attitude in favor of unethical IT use and technological relativism with attitude in favor of unethical IT use. The non-linear analysis showed most of the relationships actually have areas where the relationship is more (or less) intense than one would conclude if thinking that the relationship was linear.

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Indeed, in some cases the non-linear analyses revealed very different patterns. Regardless of the type of analysis, they draw two conclusions. First, to reduce unethical IT use, technological controls need to be implemented. Second, technological controls (and procedures) may not be enough! Sound moral education needs to be cultivated early and often to mitigate unethical behavior.

Charki *et al.* (2017) examine how legal intervention mitigates the unethical use of information technology by influencing the cost-benefit analysis that determines the decision to commit such actions. Drawing on rational choice theory from criminology, these researchers conduct an exploratory, single case study qualitative study in the context of online, real-time buying auctions that occur when businesses purchase goods and services from suppliers. They cite several studies that identify this particular setting as giving rise to "the most serious unethical usages of IT."

The results of the study show three dimensions of legal intervention that influence the cost-benefit analysis used to determine whether to commit unethical information technology use. These are the formalization of unethical use and its associated costs, the visibility of IT use, and the amplification of the effect on the organization's reputation. However, formalization of the nature of unethical IT use and its associated sanctions only affect users who perceive ambiguity about what type of use is unethical. As might be expected, greater visibility of IT use increases risk of unethical use being detected, so it reduces the likelihood of unethical behavior. Similarly, the more a legal intervention amplifies the negative impact on the organization's reputation, the less likely individuals are to engage in unethical IT use. Charki *et al.* also posit several interesting propositions involving loopholes (they lead to higher likelihood of trying to subvert legal intervention), user adaptation (new interventions trigger new unethical behaviors), and future IT use (more interventions make use more complex and increase perceived risk, leading to less IT use).

Behavior has also been investigated at the organizational level. Konsynski and Tiwana (2004) explore the key considerations of both network architecture and governance structures that characterize

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improvisational inter-firm networks. One of the key characteristics of an inter-firm network is loose coupling. Loose coupling requires modularization of the inter-firm collaborative process, and the modularization makes space for each organization in the network to move freely while maintaining the integrity of inter-firm linkage. In other words, firms that have their own deep specialization in the network coordinate with each other. The coordination across the network and the possession of their own functions do not harm each other. Thus, "loose coupling and process modularization strikes balance between the individuality and autonomy of network member firms and the ethic of the collective network" (p. 237).

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5

Calls for Research

Calls for ethics-focused research occur, but they are often made in passing when ethics is not the primary focus of the study and comprise a small part of the story being told. For example, Arnott (2004) developed the nature of the evolutionary process of a decision support system (DSS). Arnott developed a framework to understand DSS evolution grounded on the etiology, lineage, and tempo of evolution. The descriptive validity of the framework was illustrated by applying it to a quantity of published case studies and by using it to analyze and understand a strategic decision support project in a large semi-government authority. Subsequently, a research agenda for the evolutionary development of DSS was defined based on the framework and case study findings. One of the questions in his research agenda involves the "desirable nature of the psychological contract between a manager and a systems developer", and it is within this question that significant ethical considerations must be addressed.

Dutton (2011) points out the lack of research emphasizing the social and political dynamics shaping the design and role of technologies in research. He presents a framework he calls 'Research-centered Computational Networks' (RCNs) for conceptualizing the social and technological

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choices for the next generation of research. He develops the framework by synthesizing findings of case studies and projects. Some of the key focus areas to emerge from this effort include property rights, privacy, data protection, confidentiality, and the ethics of the network based research. He describes cultural, social, and ethical norms and practices as one of the main factors affecting digital choices.

Chatterjee and Sarker (2013) examine the infusion of ethical considerations in knowledge management in research design and systems. For research purposes in this paper, Chatterjee and Sarkar declare the philosophical distinction between ethics and morality per Mingers and Walsham (2010). According to Chatterjee (2007), there is a philosophical link between ethics and knowledge and often "epistemological concepts are implicitly connected to ethical ones because an important focus of epistemology is on good beliefs" (Zagzebski, 1996). It is upon this link between ethics and knowledge that the research design theory is based.

Their theory draws from the three-major business ethical approaches: consequentialism, deontological, and virtue ethics as published by Mingers and Walsham (2010). The guiding force for the research themes and questions is derived from the Knowledge Management inquiry into the IS discipline as outlined by Alavi and Leidner (2001). Chatterjee and Sarker do not create a list of ethical themes and questions, but rather they examine how ethical concepts could be infused into knowledge management research. The potential for future research should focus on extracting what deontological values are relevant to the context of knowledge creation using IT, investigating how certain IT features (i.e., knowledge management systems) can promote or inhibit ethical values, and determining what impacts such ethical values can have on knowledge creation. Other research could include determining "solutions" to make knowledge management, its surrounding activities, and consequences, ethical. Empirical evaluations should provide the necessary data and information for these "solutions". As an example, a case study in organizational knowledge management may utilize both the deontological and the virtue perspectives to realize some potential ethics guidelines.

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6

Codes of Ethics

Because the information systems discipline does not have a widely accepted (and expected) certification process like the accounting discipline, nor a professional competence designation like the "professional engineer" designation in engineering, professional codes of ethics have been developed by various computing and information systems groups over the years. These codes have been studied for their consistency, coverage, and influence on behavior.

Couger (1989) reviewed a series of computer-specific ethical issues in business during the 1990s and arrived at the necessity of proper ethical education for IS students to address ethics violations. Couger stated four sequential pedagogical approaches to ethics education to IS students, which were supposed to motivate students' proper ethical behavior in the workplace. Two scenarios were selected to test ethical conduct in students and the results from testing IS practitioners and IS students were reported.

Couger's pedagogical process was successful in causing students to think about how they personally would deal with ethics violations and how ethics education changes their behavior towards these issues. The positive impact believed to come from ethics education was supported by a reduction in cheating in the course in which Couger conducted his

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study. On the other hand, whether students have incorporated ethics into their behavior on the job was not easy to measure. At best, one could state that no unethical practices were reported from the close contact Couger had with employers of students during that time.

Given that education influences ethical behavior, which code of ethics should be taught? Oz (1992) compares five codes of ethics for similarities and differences. He examines the codes from the Data Processing Management Association (DPMA), the Institute for Certification of Computing Professionals (ICCP), the Association for Computing Machinery (ACM), the Canadian Information Processing Society (CIPS), and the British Computer Society (BCS). Oz examines the codes using an extended version of an earlier framework (see Johnson (1985)). The framework identifies six commitments:

1. Obligations to society.
2. Obligations to employer.
3. Obligations to clients.
4. Obligations to colleagues.
5. Obligations to the organization.
6. Obligations to the profession.

Oz finds similarities, differences, and conflicts between the five codes he examined. There are some areas in which the codes a difficult to interpret, such as whether an obligation to "country" applies to one's country of origin or the country in which work is being performed. He also notes that in a networked society, ethical issues that implicitly involve national borders can become very difficult to resolve. Oz notes that explicit sanctions are rarely included in the codes and that they do not provide guidance on which of the obligations takes precedence over others. He outlines the principles that a unified code of ethics for information systems professionals would include.

Pearson *et al.* (1996) used the six commitments identified by Oz (1992) to examine the relative importance of the six ethical criteria and the ability of IS professionals to articulate which of the six they used

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in a decision-making process. Using a policy capturing technique, they had 111 IS professionals (randomly selected DPMA members) read 32 scenarios and then answer questions about which criteria were important in determining whether the behaviors of hypothetical IS professionals was ethical. The researchers found two criteria: performing assigned tasks to the best of one's ability and working diligently to satisfy the organization's customers as most important to IS professionals. They also found "a commitment to the data processing profession" as consistently the least important criterion.

The respondents had difficulty articulating the importance of the criteria used in decision making. Older and/or more experienced IS professionals were found to have less difficulty than younger professionals understanding which criteria they used. Males were more able to clearly differentiate between and better articulate the relative importance of the criteria used in making judgments, but Pearson *et al.* (1996) discounted this result due to the small number of women in the study and the fact that they tended to be younger. Interestingly, the respondents who had a better understanding of the ethical considerations they used in decision making felt less need for a formal code of ethics in the profession. This result suggests those who understand why they find behaviors to be unethical will rely less on a code of ethics and such a code may be especially ineffective at influencing the behavior of older employees.

If "understanding" influences whether a code of ethics is used in decision making behavior, what other traits come into play? Harrington's research (1996) asks not only "whether codes of ethics affect computer abuse judgments and intentions of information systems (IS) employees", she also examines whether a personal trait, denial of responsibility, moderates the impact of codes of ethics on intention and judgment. Harrington notes that a major theory behind codes of ethics is an aspect of deterrence theory. The more general version of deterrence theory (in criminology) posits that illegal behavior will vary inversely with more certain and severe punishment. However, codes of ethics are not laws and thus do not always specify sanctions for unwanted behavior. Harrington examined general codes of ethics in firms, specific codes of ethics for IS professionals, and the denial of responsibility trait in individuals.

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She tested an empirical model and found that there was no support for generic codes of ethics influencing intentions or judgments. IS specific codes of ethics had little influence on intentions and judgments, except in instances of sabotage. The denial of responsibility trait was strongly correlated with computer abuse judgments and intentions. However, generic codes of ethics seem to improve some intentions and judgments of subjects who scored high on the denial of responsibility measure (i.e., subjects who were more likely to deny responsibility of their actions).

Codes of ethics are one form of institutional structure that influences employee behavior. Van Akkeren and Rowlands (2007) examine codes of ethics as part of a larger environment. They address two research questions. First, what are the enablers and inhibitors in the assimilation of a new information and communication technology in radiology practices? Second, do the four dimensions of the social actor model (affiliations, environments, interactions, and identities) illuminate the micro- and macro-level constructs and contexts that influence the assimilation process in the healthcare industry?

First, they explored the impact of institutional structures on the assimilation process by interviewing twenty-three employees within eight different sites among different occupations. Then, they developed a theoretical framework that incorporates elements of social actor theory (Lamb and Kling, 2003) to provide a more comprehensive analysis focusing on the relationships among the radiology practitioners, the technology, and a large social environment surrounding its use.

The dimensions of the social actor model that relate to inhibiting and enabling the assimilation process of a health information system are environment, identity, interactions, and affiliations. An organization's environment is influenced by regulations, professional codes of ethics, laws, and industry-wide practices (Lamb, 2006). Van Akkeren and Rowlands suggests that these dimensions had the greatest impact on the ability of employees to assimilate the new health information system. Also, the shortage of skilled radiology workers and lack of capital expenditure on training and system support were perceived as inhibitors to the health information system assimilation process.

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The social actor model provided a useful perspective to identify factors across a number of levels that had the greatest impact on the assimilation process with some constructs within each dimension being more significant than others. Further, additional constructs not mentioned in the model also appear to impact the assimilation process, which would extend the Lamb and Kling model to more holistically account for the range of issues that affects the health information system assimilation process.

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7

Design

Information systems design is an inherently social activity in which systems designers take requirements from other stakeholders, typically users, and design information systems solutions to address individual or organizational needs. Information system developers make choices during the design process and those choices inherently reflect the values of the developers. In spite of the existence of many approaches to information systems design, and improvements in those approaches, many systems implementations end up as failures. Chatterjee *et al.* (2009b) believe the root of this issue is that most information system design methods are functional in nature and overlook social aspects of the design process. They also posit that these functional approaches, which are based on assumptions/ideals of control, social integration, linearity, universality, rationality and goal predetermination are bound to lead to failure because these ideals are counter to ethical ideals.

They propose a postmodern ethical approach to information systems design that challenges such notions of authority and rejects universal ethical principles such as those in deontological and teleological ethical theories. The postmodern ethical perspective holds that what is true or right is situational or context dependent. Therefore, the only path to an

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ethical information system design is one that focuses on the situation at hand, not a methodology that is rigid and followed regardless of the problem context.

In a different paper, Chatterjee *et al.* (2009a) propose a fundamental building block for collaboration processes that is an ethical collaboration class. They note that designers inherently embue their artifacts with their values. Thus, the design of a collaboration system must be particularly careful to include a means for supporting collaboration processes in an ethical manner. They draw on Collaboration Engineering, a process that has not systematically incorporated ethical considerations. They also draw on design science research and particularly leverage Walls *et al.*'s (1992) design theory concepts. Their class – which is conceptually defined but not instantiated – is built on deontological ethics theory. In taking a theory-based approach, these researchers respond to calls for more theory-based collaborative work processes. Their approach also systematically embeds ethics into the collaboration process, rather than leaving the consideration to more ad hoc means.

Thanasankit (2002) argued that software development is a complex social process, not simply technological challenge. He quoted Lowry's (1997) statement that:

> Information systems research is difficult because it always involves people, technology and the linkages and interactions between them. If we remove the technology, we are no longer studying information systems but are working in reference disciplines such as psychology, sociology, human communication, organizational behavior, philosophy, epistemology, ethics, logic, anthropology and theology. Similarly, if we remove the human aspects, we position ourselves in computer science, electronic engineering, communication technologies, physics, chemistry and other technological reference disciplines.

With this in mind, Thanasankit examined the influence of power in Thai society on requirement engineering processes in a Thai software house, finding that Thai culture influences requirements engineering in Thailand. Thanasankit noted that indigenous culture shapes behavior

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and may be extended into the systems development life cycle as a whole. He described what happens in the requirements engineering process and explained how power in Thai society and Thai values impact that process. Thanasankit observed eight Thai systems analysts and interviewed them over a three-month period. He also used a framework of ethnographic methodology that enables an analysis of the socially informed use of techniques and processes within requirements engineering.

Siponen *et al.* (2006) describe a theory-based framework for the design of secure information systems. They identify six meta-requirements, with meta-requirement number four focused on the autonomy of the developers of the system. This meta-requirement dictates that developers have the autonomy to choose the development method and language they deem best for the job. They hypothesize that adherence to this meta-requirement will lead to designs that produce more successful, secure information systems in organizations.

Though it may seem redundant, no treatment of ethics in IS design research would be complete without a discussion of ETHICS, the Effective Technical and Human Implementation of Computer Systems technique (Mumford and Weir, 1979; Mumford, 1993). This participative, socio-technical approach was developed over a number of years and through a number of design engagements by Enid Mumford (c.f., (Mumford, 1983b)). Stahl (2007) observed:

> "The choice of acronym shows that Mumford was aware that the participative approach is not just a management tool but has normative implications. The reason why ETHICS is ethical include the inclusion of all stakeholders in the design process, the ability of users to exert influence over their future roles, and the sense of ownership and control it offers to system users." (p. 481)

ETHICS has three principal objectives: to enable future users to play a major role in systems design, to ensure that new systems are acceptable to users, and to assist users in becoming competent in managing their own organizational change. ETHICS includes a suite of tools that has been developed in response to an increasingly complex process of designing computer systems. These tools address needs such

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