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Toward JUSTIS—A Research Program Aimed at Fostering Business Ethics by Empowering Stakeholders Through Information Systems

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Abstract:

As incidents involving corporate social responsibility—or rather the lack thereof—hit headlines at regular intervals, stakeholders are becoming increasingly concerned about ethical issues, thus encouraging researchers to identify problematic business processes and pressing practitioners to start rectifying their questionable courses of action. In the meantime, information systems (IS) are becoming ever more pervasive and ubiquitous and are shaping and altering many of our everyday activities and behavior. We argue that when it comes to promoting ethical behaviors, IS can be used as powerful tools to empower stakeholders, and, thus, it is crucial to consider the role that IS can play in either advancing or deterring ethical—or conversely, unethical—behaviors. In this article, we present a research agenda for a new research program specifically concerned with the task of analyzing the social impact of existing IS and devising new ones that can be used to encourage ethical behavior. JustIS is the name of this program.

Keywords: JustIS, just IS, business ethics, ethical responsibility, stakeholder, B–A–O model, belief–action–outcome model

I. INTRODUCTION

After the Enron scandal, corporate social responsibility was recognized as a necessity to support sustainable business. In fact, and as a consequence, many U.S. business schools were required to introduce business ethics courses into their curriculum. Now, in the wake of the Great Recession, the importance of promoting socially responsible business practices and ethical management practices seems to be more relevant than ever. Ethics, or rather the lack thereof, as one of the main culprits that led to the financial debacle was even pointed to by many, including the Financial Crisis Inquiry Commission [2011].

In order to move toward more ethical grounds, two complementary approaches exist: an internal approach and an external approach. The internal approach entails businesses promoting an ethical vision for their business, such as Google's "Don't be evil" slogan and establishing codes of conduct for their employees [Kaptein, 2004]. This approach is sometimes criticized for its lack of effectiveness [Cleek and Leonard, 1998] and also because it is perceived as a smokescreen used mainly for enhancing public relations through so-called "greenwashing" [Laufer, 2003].

The external approach involves outside stakeholders who put pressure on a company. Stakeholders are defined as "any group that affects or is affected by firm behavior" [Freeman, 1984]. While primary stakeholders are mainly customers and employees, secondary stakeholders typically include community activists, advocacy groups, and non-governmental organizations (NGOs) [Eesley and Lenox, 2006]. In fact, many NGOs have been created with exactly this objective in mind. Some follow a symbolic gain strategy, where some NGOs, such as Fairtrade Labelling Organizations International (FLO) or the Worldwide Responsible Accredited Production (WRAP), propose to label products that have been produced under certain labor conditions or by facilities that respect certain standards. For example, Max Havelaar coffee is labeled Fairtrade, and Fox River Mills in Osage, IA, U.S., is labeled WRAP [van Huijstee and Glasbergen, 2010]. Others, such as Amnesty International and GreenPeace, apply a symbolic damage strategy by providing incriminating reports or corporation rankings to raise awareness and to pressure companies to change their processes [van Huijstee and Glasbergen, 2010].

In addition to advocacy groups or NGOs, the local (or national) government is another body that is able to put pressure on public companies. For example, following the wave of accounting scandals at the beginning of the century, the U.S. legislature put the Sarbanes-Oxley Act in place, aimed at enhancing accountability and transparency and reducing conflicts of interest in order to expose unethical behavior early on in the process. Sarbanes-Oxley also had another effect—it caused companies to spend roughly 6 billion USD on the implementation of information systems (IS) on an annual basis [Reuters, 2007; Protiviti, 2011].

As the example shows, IS can be a central vehicle for the pressures put forth by the stakeholders. It not only allows the gathering and processing of relevant information, but also provides process transparency and facilitates its easy dissemination. With increased connectivity, more and more people—and more and more stakeholders—are better informed, and can more actively participate in the provision of data. However, when it comes to ethics, IS has mainly been studied as the cause of ethical issues, such as privacy and security, rather than as a potential solution.

In this article, we advocate the investigation of IS that are geared to support business ethics. More precisely, we advocate for the investigation of IS that can help stakeholders pressure companies to behave more ethically. To do so, we propose four research questions that can serve as a starting point for future research.

II. BACKGROUND

Hereafter, we present several definitions of ethics proposed by prior literature, before reviewing the efforts to address ethical issues in the IS community.

Defining Business Ethics

Providing a universal definition of business ethics proves to be a challenging task. Many different ethical theories and schools exist that can be used as a starting point for defining business ethics. These theories range from consequentialism or utilitarianism (i.e., Bentham, John Stuart Mill) and deontology (i.e., Kant, Rawls) to virtue ethics (i.e., Aristotle), communautarism (i.e., MacIntire), and discourse ethics (i.e., Habermas). An early attempt to synthesize the plethora of descriptions was made by Lewis [1985], who suggested business ethics are "rules,

standards, codes, or principles which provide guidelines for right and truthful behavior in specific situations" (p. 381). While helpful, this definition, unfortunately, omits the specific content of these standards, leaving it up to society to establish norms and rules for any given situation.

In the corporate context, a good place to look for widely recognized principles and values is in the codes of ethics, drafted by companies themselves. Sometimes referred to as business codes, codes of conduct, or ethical policies, codes of ethics are documents that define a corporation's objectives, its values, as well as its responsibilities toward stakeholders. While the existence of codes of ethics within a corporation is not a guarantee of ethical behavior per se—as the findings of Cleek and Leonard [1998] and Harrington [1996] illustratively show, they are nevertheless an important tool to communicate culture and ethical aspirations to the inside, as well as the outside, world.

A study conducted by Kaptein [2004], for example, performed a content analysis of codes of ethics across the 200 largest companies in the world. The study's underlying assumption is that the frequency of a certain code surfacing is strongly correlated with the number of companies endorsing it. Out of the 52.5 percent of corporations that were found to have a code of ethics in place, more than half paid particular attention to their responsibility for delivering high-quality products and services, their adherence to comply with local laws and regulations, and their intention to protect the environment [Kaptein, 2004]. More than 40 percent cited the achievement of investment return, the development of talent, and the offering of acceptable working conditions [Kaptein, 2004] as part of their codes.

Most codes of conduct address the same set of principal stakeholders: customers, community at large, employees, and shareholders. *Consumers* have a direct relationship with the product or service of the company. As they are the source of revenue, their concerns and actions can have a direct impact on the company's business. (In fact, one of the most relevant ethical objectives for corporations, according to Kaptein's content analysis, is the provisioning of high-quality products and services to its customers.) *Community members* are mostly affected by the jobs that the company creates, the taxes it pays, and its impact on the environment. In some cases, community members can set rules and regulations regarding the practice of a company. However, many abuses occur in countries where the power of the local community is not strong enough to influence the company's behavior. *Workers* are at the heart of ethical behaviors; they can be the vehicle, such as when they are involved in predatory lending, or the victim, such as in the case of child labor. And *shareholders* have an important role, as they finance the company. However, their expectations are not always in line with the expectations of other stakeholders. Table 1 (summarized from Kaptein, 2004) presents the various stakeholders considered in the codes of ethics and summarizes their major expectations.

Table 1: Stakeholder Expectations [Kaptein, 2004]			
	Consumers	Community	Workers	Shareholders
Expectations	- Fair price - Good product - Healthy product - Improving quality	- Observing the law - Donations - Charity - Environment preservation - Preventing impact on health	- Safe workplace - Encouraging personal development - Decent treatment - Equal opportunity	- Maximal/satisfactory/ sound return on investment for the risk

As businesses deal with different stakeholders, expectations and their level of importance might differ, depending on the various perspectives. While some of these priorities are compatible, others are conflicting. It is, therefore, important not only to assess the needs and wants of each stakeholder separately, but also to look at them in combination in order to mitigate tensions.

In the following, we consider business ethics to be the moral rules, standards, codes, or principles which provide guidelines for right and truthful behavior in order to meet stakeholder's expectations.

Ethics and Information Systems

In its long history, ethics has primarily placed the human being at its focal point. It is the individual who holds and develops an ethical belief system, and it is also the individual who acts upon it. However, philosophers, particularly Floridi [2006, 2007, 2010b], have recently pointed out that ethics without the inclusion of "informational objects" is incomplete. In his definition, informational objects are conceptualized as "discrete … self-containing … encapsulated packages" [Floridi, 2010a, p. 261]; they do not necessarily have to be physical. Pieces of information, such as a news clip or an online product, qualify as informational objects—and so do information systems. In addition, informational objects can either act as "moral agents," i.e., they can influence other objects ethically, or they can act as "moral patients," i.e., they are the recipient of moral activity, such as animals or the environment [Floridi, 2011]. A documentary about an oil spill, for example, can potentially influence the purchasing behaviors of consumers and thus qualifies as a moral agent. However, it can also be the outcome of moral activity, let's say as the result of environmentalists who want to showcase the world's dependency on oil. The environment as well as the animals

that are spared by avoiding a potential oil spill would be yet another example of a moral patient. Information systems can be both moral agents and patients. They can either serve as a vehicle that triggers ethical behaviors, like the system we will introduce later in this article, or they can serve as the recipient of ethical behavior, for example, through the very nature of being a system that conforms to ethical behaviors or simply by users who refuse to use a system that promotes unethical behavior.

Viewing information systems as moral agents and patients is a rather new perspective. The ability of information systems to influence as well as solicit responses from other informational objects is one of the fundamental assumption of this article, but this ability is also important to consider when investigating how information systems can best foster ethical behaviors. However, research in this context has been very limited. But even those scholars who claim that information systems intrinsically reduce the possibility for ethical behavior due to the fact that interactions between people take place in a world of hyper-reality, which tends to make them insensible to each other's ethical claims [Introna, 2002], implicitly acknowledge that information systems play a role in shaping human ethical behavior. They also argue that when a human actor encounters a nonhuman actor, he or she holds assumptions about the other that can prove wrong when cultural variety is present [Introna and Hayes, 2011].

Other scholars—in their quest to examine ethics and IS—focus on specific challenges that arise with the use of information systems. For example, an early paper published by Mason [1986] recognized four main ethical challenges in the context of information sharing under the acronym PAPA: Privacy, Accuracy, Property, and Accessibility. Twenty-five years later, and despite a tremendous change in technology, the core of these concerns still applies. The PAPA challenges are especially relevant with the advent of social networking [Parish, 2010]. As was true twenty-five years ago, current IS literature is especially concerned with privacy (e.g., Stewart and Segars, 2002; Smith, Milberg and Burke, 1996; Bonner and Chiasson, 2005; Cannoy and Salam, 2010; Smith, 2002; and Smith and Hasnas, 1999), trust [Charki and Josserand, 2008; Moldovenau and Baum, 2011; Wagner, Scott and Galliers, 2006; Fleishman and Wallace, 2005], and property—mostly under the umbrella of data piracy (e.g., Hilton, 2000; Peace, Galletta and Thong, 2003; Chen and Png, 2003). In order to better understand ethical issues, some researchers have even suggested viewing these concerns through different lenses, including criminology theories [Willison, 2006] or feminist ethics [Adam, 2001].

Still other scholars have proposed using ethical theories to better design information systems [McGrath, 2006; Ross and Chiasson, 2011; Friedman, Kahn and Borning, 2008]. For instance, Friedman et al. [2008] propose Value Sensitive Design (VSD), a framework that bases IS design on human values in order to reduce the negative impact of IS. They argue that IS and IT artifacts should be based on values, such as privacy, autonomy, usability, trust, and cooperation. Therefore, any VSD should have three components: a conceptual investigation that determines what values are affected by the artifact, an empirical investigation that assesses how users prioritize values, and a technical investigation that looks at how existing technological properties and mechanisms support or hinder human values. Additionally, McGrath [2006] argues that emotion should play a central role when devising IS. Through the lens of Foucault's work on ethical conduct, she sees "IS innovation as a moral and political struggle in which individuals' beliefs and feelings are constantly tested." Similarly, Ross and Chiasson [2011] discuss and clarify Habermas's Theory of Communicative Action in the context of IS requirements processes, which can be seen, not as a search for truth, but as an ongoing process that should involve many stakeholders.

In sum: The majority of works on ethics and IS view information systems as part of the problem, i.e., they consider how to understand, measure, and mitigate the ethical issues caused by the introduction of an information system, whereas only a minority among the works consider an information system to be part of a potential solution for ethical dilemmas. We position our work in the latter category and consider how IS can be used as tools to empower stakeholders in order to facilitate the resolution of ethical issues that affect them.

III. STAKEHOLDERS' INFLUENCE ON BUSINESS ETHICS

In this article, we focus on the relationship between stakeholders and the ethical behavior of businesses. On one hand, stakeholder expectations set the ethical goals companies should meet. On the other hand, stakeholders can apply pressure on businesses to meet these goals. We model stakeholders' influence through a framework derived from the Belief–Action–Outcome framework proposed by Coleman [1986] and used in the context of Green IS by Melville [2010].

Figure 1 illustrates the Belief–Action–Outcome framework. *Beliefs* represent stakeholders' values and awareness about certain corporate behaviors. In the context of this article, beliefs serve to define an ethical scale and work as guidelines that set ethical standards and that are partially manifested in the codes of ethics presented earlier (arrow 1). An *outcome* is a firm's score on the previously defined business ethics scale. To be acted upon, a firm's outcome has to move into a stakeholder's range of awareness in order to influence his or her belief (arrow 2). A stakeholder's

beliefs about a certain outcome can, in turn, trigger some form of action (arrow 3). An *action* is a behavior that a stakeholder can adopt in order to impact a business outcome (arrow 4).

Depending on organizational practices and characteristics, such a Belief–Action–Outcome framework can create a virtuous circle [Sarkis, Gonzalez-Torre and Adenso-Diaz, 2010; Delmas and Toffel, 2004]. Companies that yield to stakeholder pressure will attract environmentally conscious workers, which will lead to a greater offer of ethical goods and services, which will attract more consumers, who will in turn force competitors to join the ethical route, and so forth.
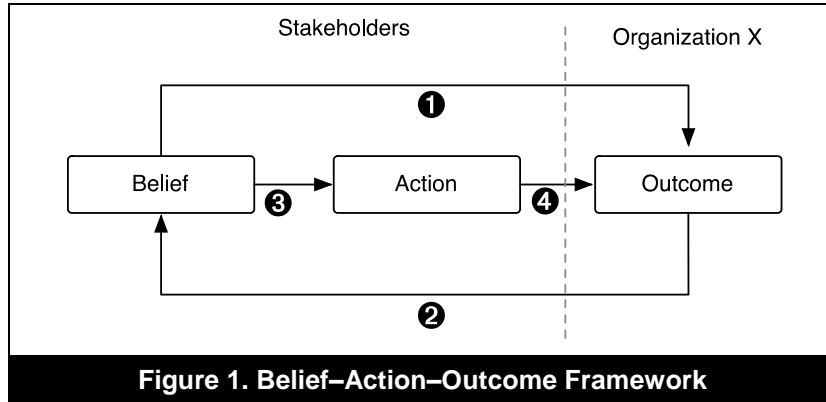

Figure 1. Belief–Action–Outcome Framework

Beliefs—Stakeholders' Values and Awareness

Beliefs are convictions that stakeholders hold about right or wrong, about ethical or unethical behavior exposed by others. As we saw earlier, stakeholders' beliefs shape their expectations and, thus, the definition of what business ethics means in a given situation at a given time. The top ten overarching principles that have been identified by companies as the basis for defining specific goals are described by Kaptein [2004] and are summarized in Table 2.

Table 2: Stakeholder Values
1. Transparency
2. Honesty/truth
3. Fairness/impartiality
4. Trust
5. Empathy/respect/diversity
6. Stimulating stakeholder to raise concerns
7. Accountability
8. Dialogue
9. Equality
10. Responsiveness

However, stakeholders' beliefs with respect to business ethics do not stop at the definition of what is right or wrong. Their beliefs also include an awareness about whether a particular company upholds these principles or not. This notion of awareness is closely linked to the notion of beliefs. Without awareness, beliefs would remain static and potentially would never change.

Monitoring outcomes, particularly ethical breaches, is a challenging task since the stakeholder, as well as the company, might lack what Palazzo [2007] calls "moral imagination" by not seeing the ethical implications of certain actions. Furthermore, the belief that performing a behavior can change a situation is also an important predictor of action, as suggested by Klein, Smith and John [2004]. The more people have a feeling that their actions will have an impact, the more they will engage in these actions.

Actions—Stakeholders' Pressure

Stakeholders can influence firms through overt actions that are determined by their beliefs and potentially facilitated through opportunities such as regulatory changes or the emergence of new allies [King, 2008]. In that sense, behaviors are actions that can take either direct or indirect effect. Direct actions are geared toward the relationship between the stakeholder and the company; they may include consumer boycotts, shareholder divestments, or worker pressure through unions [Egels-Zandén, 2009]. Indirect actions, on the other hand, are directed toward other stakeholders, for example, by raising their awareness so that they take action.

Determining whether or not a certain type of action has the expected outcome is crucial, as some actions might backfire [Basu and Zarghamee, 2009]. A seminal work by Frooman [1999] proposes two strategies: withholding, i.e., not providing a resource (for example, by boycotting), and usage, i.e., providing a resource with strings attached. Based on the power relationship between firm and stakeholders, Frooman [1999] argues that it is possible to predict which path is typically chosen. If, for example, the level of the firm's dependency on stakeholders is low, withholding is used. However, if there is a high dependency between the firm and its stakeholders, a usage strategy is pursued. This study also proposes two pathways to influence a firm: direct and indirect (i.e., work through an ally). If there is a high dependency of firms on stakeholders, direct strategies are used. If, however, there is low dependency of firms on stakeholders, indirect strategies are applied.

Some further empirical tests of the stakeholder strategy model, conducted by Tsai, Yeh, Wu and Huang [2005], found that in the context of business downsizing, stakeholders mostly adopt a direct usage approach. In other words, stakeholders, feeling the high level of dependency, would provide resources but with specific conditions attached. As a result, the authors suggest one more dimension: legitimacy, which measures the accordance of a corporate behavior, with the firm's social responsibility and with ethical standards. Withholding strategies would be used in the case of low legitimacy of a firm's behavior, whereas usage strategies would be used in the case of behavior with higher legitimacy.

In order for stakeholder pressure to work best, there has to be a balance between stakeholder empowerment complemented by a context that promotes ethical behavior and the institutionalization of control systems [Palazzo, 2007]. We argue that information systems can be used as a powerful tool in order to support the creation of this balance.

IV. JustIS—EMPOWERING STAKEHOLDERS

In order to increase the adoption of ethical behavior in businesses, stakeholders must be empowered so that their awareness of unethical behavior is maximal and their actions are most effective. We suggest that specialized information systems should be specifically devised to support that endeavor. As existing research does not fully address this issue, we propose to establish a research program specifically aimed at studying it. We call this program JustIS.

Until recently, IS have primarily been deployed within organizational boundaries only. With the advent of mobile technologies, however, information systems transcended into the personal sphere and became an integral part of everyone's life. Today, individuals consume vast amounts of information on a daily basis, often with the help of mobile gadgetry, including Androids, iPhones, and tablets. We believe that mobile applications will play an important role in the answers to these questions, since they allow users to access relevant information from anywhere and share it with others at any point in time. Hereafter, we present some commercially available examples of information systems that support—at least in part—ethical beliefs, actions, and outcomes, along with a prototype, called CleanGas, that we specifically developed for the purpose of this article. CleanGas will be used to demonstrate how each link in the Belief–Action–Outcome framework can be supported.

Fundamental to each information system is the assumption about the validity of information processed within it. Making sure that information is accurate, relevant, and timely is a vital requirement—not only for systems that follow ethical standards, but for all systems. This issue is inherently challenging, as it is not only confined to the information system itself. Whenever systems or applications are developed, "there is a triad of intentionality at work, the intentionality of the system designer, the intentionality of the system, and the intentionality of the user." Admittedly, any of these components can be a potential pitfall to ethical analysis. For the purpose of this article, however, we assume that the intentionality of all three is an ethical one. In the case of Clean Gas, for example, an application that supports a stakeholder interested in purchasing gas for his or her vehicle, the assumption is not only that an ethically conscious individual is most likely to reduce his/her support for oil companies that expose questionable ethical behavior, but also that the information provided to the application is valid in the first place.

In the following, we tackle each link in the Belief–Action–Outcome framework separately. We elaborate on what extant IS literature has to say about this particular link and also on what information systems already exist in support of this link. In addition, we also showcase how CleanGas, chosen to be a hypothetical IS example, could potentially support the Belief–Action–Outcome framework in a better way. Each section ends with a central, yet open question—a question that, we believe, is fundamental to a JustIS research program.

Belief → Outcome: Setting Ethical Signals for Organizational Behavior

Evaluating the ethical concerns of stakeholders is a nontrivial task. These values change over time and, with it, the standards that define the boundaries of business ethics. For example, a study by Rodgers and Gago [2004]

describes how stakeholders' philosophies were taken into account over the last seventy-five years in the way businesses report on their activities in companies such as Coca Cola. They outline several types of concern, for example, "being a good corporation," based on different philosophical stances, such as the ethics of care philosophy. However, they neither describe how companies gain awareness of these concerns to set standards, nor showcase that setting standards indeed has an impact on business processes. While this remains largely unresolved, Kaptein [2008] took a slightly different approach for soliciting a measure of unethical behavior in business organizations. By using a thirty-seven-item questionnaire, clustered around the various stakeholder groups, he analyzed the codes of ethics of more than 200 companies [Kaptein, 2004]. He did not directly evaluate stakeholders' values, but instead relied on business codes as a representation of an organization's core principles. In this context, an information system can be seen as a manifestation of codes that incorporates—in digital form—a set of ethical standards put forth by stakeholders.

What Does Extant IS Literature Say About Setting Ethical Signals for Organizational Behavior?

The IS literature is largely silent on the question of how an information system could best help in gathering ethical values and disseminating them to relevant parties. Iyengar, Luskin, and Fishkin [2003], for example, compare the effect of face-to-face polling used in politics versus online polling, which is much more cost-effective and flexible. They argue that online polling has a significant potential for improving public consultation and citizens' education. Several researchers have also started investigating IS support for discourse ethics [Mingers and Walsham, 2010; Asif and Klein, 2009]. Discourse ethics (by Habermas) is a school of ethics, which holds as its mantra that "only those norms can claim to be valid that meet with the approval of all affected in their capacity as participants in a practical discourse." Central to this idea is the involvement of as many stakeholders as possible in a proper debate about an issue in order to build a valid norm. Information systems that allow user participation, such as group decision support systems, Internet forums, and Web 2.0 tools, provide a first step in this direction.

Existing Applications That Address the Issue

Examples of information systems that support the link between belief and outcome include political compass applications[1] where community members' concerns are captured in an easy and user-friendly way in order to show them how close they are to a certain politician or party or where they are located on the political spectrum. Yet another one is PoliTap (www.politap.com), available as a website and mobile application, that allows citizens to write to their elected officials about ongoing local issues that bother them. Such applications are good first steps in the direction that we envision. However, they lack several aspects that we think are essential in order to make them more effective. For example, it is generally difficult for users to know about the values and concerns of others, as, typically, there are no direct sharing mechanisms available. Furthermore, political compass applications generally focus more on informing the user about his or her own political preferences and less on conveying these preferences to politicians so that the latter can change their political direction accordingly.

In order to overcome some of these shortfalls, we can imagine a mobile application that allows stakeholders to share their concerns with companies and gain a good understanding of the other stakeholders' concerns, as shown in the CleanGas scenario in Figure 2. To increase the likelihood that companies react to stakeholder values, all companies of a given industry, for example, could receive automatic notifications via email when a certain number of concerns are raised.

Open Research Avenues

We believe that the existing work in the IS field as well as the existing applications make a strong case that an information system can be used for establishing norms and standards. The next logical step is to investigate thoroughly attributes of information systems to fill this role. Thus, one of the fundamental questions to be answered by our proposed JustIS research program is:

(RQ1) What are the characteristics of an IS that captures ethical concerns of stakeholders and conveys them to others?

Apart from tapping into the most basic characteristics that have to be in place for evaluating ethical concerns, this question also raises several other underlying issues. From a psychosocial and philosophical perspective, for example, the question of how ethical values and concerns are expressed and measured is of central importance. And, from a software engineering perspective, there is the question of what kind of programming supporting tools, such as libraries, languages, programming paradigms, etc., would make it easier for developers to provide such

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[1] An example of a political compass application is Smartvote (www.smartvote.ch).

Figure 2. Gather and Advertise Concerns to Set Ethical Standards

an information system. Such tools might include predefined modules for ensuring privacy, encapsulation of data, and encryption—overall, providing stakeholders a high level of comfort when voicing their concerns and/or sharing their ethical values.

Outcome → Belief: Turning Organizational Behaviors into Stakeholder Awareness

Once stakeholder values are captured, it is—at least in principle—possible to measure the discrepancy between organizational behavior and ideal ethical values. In order to act on the discrepancy, stakeholders must become aware of it. Information systems can help monitoring, disseminating, and reporting ethical behaviors of firms to stakeholders.

What Does Extant IS Literature Say about the Influence on Stakeholder Awareness?

The importance of information in shaping and forming beliefs has been studied repeatedly (e.g., Shaw and Clarke, 1999; Melville, 2010). Likewise, research has confirmed that information overload can have a negative impact on beliefs. As an illustration, Shaw and Clarke [1999] report on a participant who described a feeling of helplessness when he or she could not cope with the flood of information. Unfortunately, there is a lack of formal investigation about the influence of information on the sustainability of beliefs, as well as the relationship between information systems and the formation of beliefs.

Existing Applications That Address the Issue

An example of an information system that unearths what organizations are doing is Wikileaks. By promoting transparency and disseminating organizational information to the general public, this information system set out to create awareness and inform stakeholders and the public about aberrant ethical behavior. Whistle blowing, as the action is sometimes referred to, is made easier through this type of information system, as it guarantees a certain level of anonymity for those who are undecided or ambivalent about informing the public. Because of its accessibility and wide reach, Wikileaks can have a strong influence on steering stakeholders (and the public) to put pressure on firms to adopt more ethical behaviors. SpillMap (www.spillmap.org), a site that provides an unfiltered, up-to-the-minute view of the damage caused by the Gulf of Mexico oil spill, allows stakeholders to get the most realistic view of the situation. Ushahidi (ushahidi.com), built on an open-source platform, enables the gathering of stakeholders' concerns regarding natural and political disasters. Everyone can contribute using one of multiple channels, including SMS, MMS, and online reporting. The results are then displayed on an interactive map. All these examples are powerful information gathering engines that provide useful information for tech savvy users who have the skills and time to search out relevant information in the massive piles of document repositories. However, as these systems generally present information in a raw form, it typically takes experts to draw conclusions from the various pieces of information.

Other applications exist that try to hide the complexity of information behind company rankings, such as the Good Shopping Guide,[2] a mobile app that rates companies and their products in various categories, ranging from good to bad, depending on their treatment approach toward the environment, animals, people, and other criteria. These applications are a good starting point, but most of them are based on information gathered by a centralized agency using a proprietary form of ranking. We believe that these systems could potentially benefit not only from decentralized stakeholder inputs, but also from a more widely accepted and transparent ranking system.

One could think of CleanGas as a ranking application, as shown in Figure 3, that summarizes ethical information about various oil companies and displays their respective standings in a simple and easily understandable format for stakeholders. Furthermore, this application would include an input option through which stakeholders could share information. In this portion, the information shared would not be about stakeholders' values and concerns, but about a firm's behaviors.

Open Research Avenues

The need for an information system that is able to collect, synthesize, and disseminate information about ethical behaviors prompts the research community to seek a formal investigation. Thus, one of the fundamental questions for our proposed JustIS research program is:

(RQ2) What are the characteristics of an IS that informs stakeholders about the level of ethics involved in organizational behaviors?

As with the previous research question, this item raises several other questions. For example, there are fundamental philosophical questions, such as how to measure the ethical conduct of organizations. Furthermore, and sitting at the crossroads of psychology and IS, questions on how to improve information trustworthiness are particularly important to solve. In regard to programming support, modules or mechanisms that allow the evaluation of information trustworthiness might be of great importance. Trust certificates for modules or trusted third-party providers might be an option. These issues not only allow stakeholders to base their judgment on sound evidence, but also increase the likelihood of ethical behavior.
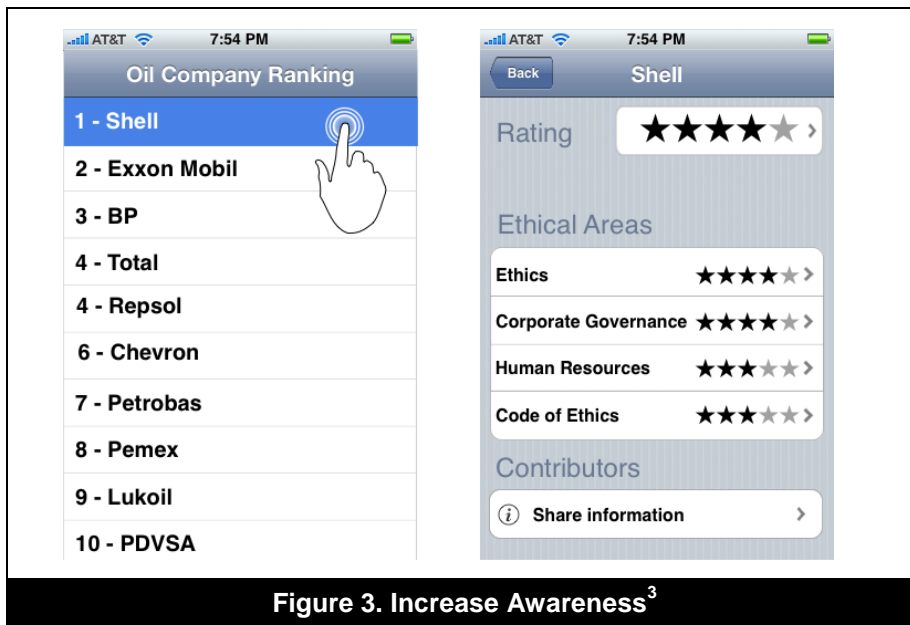

Figure 3. Increase Awareness[3]

Belief → Action: Stimulating and Simplifying Actions

Stakeholders' awareness of corporate misbehaviors can lead to actions that prompt the correction of misconduct. An information system can help facilitating pro-ethical actions based on ethical beliefs. If we assume that an educated stakeholder is willing and able to act, we can envision an information system that would not only simplify the choice of engaging in an action, but also make the action more effortless for a stakeholder.

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[2] The Good Shopping Guide for iPhone can be found at http://itunes.apple.com/us/app/the-good-shopping-guide-ethical/id416083134?mt=8.

[3] This ranking example is based on a study conducted by Management Excellence [2005].

What Does Extant IS Literature Say about the Influence on Stakeholder Action?

In the IS discipline, consumer behaviors have been studied mainly in the context of adopting or using the IT artifact (with methods such as the Technological Acceptance Model [Davis, 1989])—less in the way the IT artifact influences users' behaviors. Lately, with the raising concern about sustainability, the area of Green IS has tackled this problem for sustainable behaviors by proposing a framework consisting of four different information drives that have to be considered when creating information systems and business practices (i.e., ubiquity, uniqueness, unison, and universality) [Watson, Bourdeau, Chen and Huber, 2008; Junglas and Watson, 2006]. When designing an information system, such as a transportation system, these drives should be met. Other models, such as the Theory of Planned Behavior [Ajzen, 1991], have been used to predict selection behaviors when choosing "green" hotels over other alternatives [Han, Hsu and Sheu, 2010]. Unfortunately, existing literature has not yet put user behavior in the context of both information systems and pro-ethical actions.

Existing Applications That Address the Issue

Examples of information systems addressing this issue include Barcoo (www.barcoo.com), an application on the brink between raising awareness and facilitating change. It allows customers to point their phones at a product's barcode and find out the brand's ethical profile. The information is gathered from different sources, including company statements, publically available social responsibility studies, as well as user feedback [Guardian, 2010]. Other applications that facilitate actions to be taken on the spot include Shop Ethical 2011, providing a similar service to Barcoo by allowing consumers to assess companies before making a purchasing decision; Fair Fashion, a service that is geared toward clothes shoppers; and iTradeFair,[4] an application that displays a map with the closest fair-trade shops in the vicinity.

These applications are a good starting point. One of the major drawbacks, however, is that users must proactively run the application and look for favored products. Therefore, it seems important to investigate ways in which pro-ethical choices are integrated seamlessly into a stakeholder's daily life. For example, in the CleanGas illustration, we can imagine that the information about an oil company's ethical rankings is integrated into a navigation system that is able to depict the higher-ranked gas stations while driving, as shown in Figure 4. As a result, a consumer's choice to take action (in this case to potentially boycott one gas station and encourage the use of another) is facilitated. The application has lessened the costs associated with switching and increased the attractiveness of ethically sound gas stations.
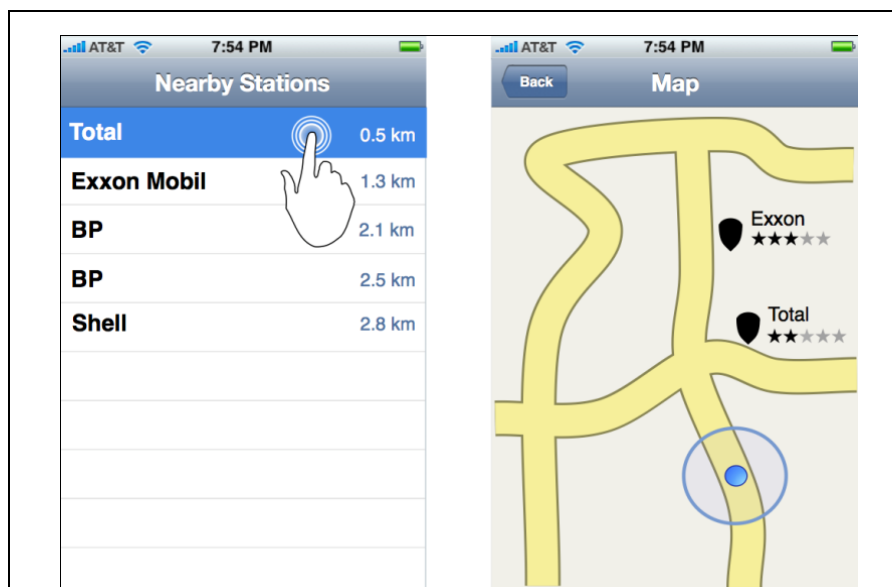

Figure 4. Facilitate Action

Open Research Avenues

Given the insufficient research on the subject and the ample room for more sophisticated applications to encourage pro-ethical actions, we propose the following research question for the JustIS program to help further our understanding on that matter:

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[4] iTradeFair can be downloaded at http://www.ifreeware.net/download-itradefair.html.

(RQ3) What are the characteristics of an IS that encourages stakeholders to undertake pro-ethical actions?

As with the previously proposed questions, this question raises issues concerning the way we measure the relationship between belief and pro-ethical actions. Furthermore, as far as programming support is concerned, support for location-based and, more generally, context-awareness is crucial to provide stakeholders with information tailored to their particular circumstances. Having the right information available, that is, reflective of the current environment, not only facilitates awareness, but also increases the chances of behaving ethically.

Action → Outcome: Demonstrating Outcomes

Measuring the impact of stakeholders' action is important when evaluating what type of action is effective in leading to pro-ethical changes in corporate behavior. An information system can support this evaluation in multiple ways. It can be helpful by aggregating stakeholders' actions, such as private consumer boycotts, and then conveying the results to companies in order to increase the impact of these multiple and diverse actions. Stakeholder actions can have two types of impacts on a firm: a direct and an indirect impact. A direct impact is present when an action has an immediate effect on the resources of a firm, such as on sales (via boycott) or on production (via strike). An indirect impact is present when a firm decides to change its behavior in response to a given action. Information systems have the potential to increase the indirect impact by increasing awareness of the pro-ethical actions undertaken.

What Does Extant IS Literature Say about Measuring the Impact of Pro-ethical Actions?

In the context of user-provided content applications, and in the special case of crowdsourcing [Doan, Raghu Ramakrishnan and Halevy, 2011], which captures systems that outsource tasks to the crowd, data collection and aggregation has been thoroughly investigated. Examples of such systems include YouTube, which collects and displays videos, and Wikipedia, which aggregates and presents textual knowledge bases. One of the key challenges of these applications is the ability to provide an easy-to-use interface for users to contribute. Another challenge is to simplify information access and to avoid information overload, as mentioned above. Successful systems will probably need to involve the feedback of many stakeholders and to provide a comprehensive set of services, ranging from gathering ethical values to triggering ethical actions. In order to build such a system, a decentralized distributed development model might be applicable. The Metropolis model [Kazman and Chen, 2009] takes such a community-driven approach and serves as a good starting point to develop such a system. In their model, software is built in a decentralized fashion by *open teams*, where there is little control on who contributes (e.g., Wikipedia), using the concept of *mashability*, where software parts can be used and reused (e.g., Linux), and *emergent behavior*, which implies that mechanisms that go beyond the vision of the originators may appear and the original objective determinism may be lost. Unfortunately, the IS literature has not yet formally investigated ways to best measure the impact of ethical actions or ways to increase their impact.

Existing Applications That Address the Issue

Examples of applications addressing a similar issue comprise the website portal of the bike rental company Bixi (www.bixi.ca), which tallies the number of miles traveled by bike (instead of by car) and displays the amount of gasoline saved. While this application does not serve as direct pressure against the private transportation industry, it can be used as evidence to push for more inner-city bike lanes and other facilities for cyclists. Another application is ChinaStrikes (chinastrikes.crowdmap.com), which displays the strikes and grievances of workers in China on a geographical map that is accessible to everybody, including the Chinese government.

In the CleanGas application, it is conceivable that messages are automatically sent to the company in order to inform it about the actions taken by stakeholders. More specifically, it is conceivable that the application aggregates the amount of gasoline purchased from each vendor or the number of visits at a particular station, as depicted in Figure 5, and relays these trends to the vendor.

Open Research Avenues

As indicated, the IS community provides important building blocks to investigate the issues at hand through the development of user-provided content applications, but it has neglected to evaluate the outcomes achieved from those applications. Thus, we propose the following research question as part of our JustIS research program:

(RQ4) What are the characteristics of an IS that increases the impact of a pro-ethical action?

This question raises, yet again, other questions about the appropriate measurement of pro-ethical actions, as well as questions about underlying programming support, that could adequately alleviate the burden of devising an information system that is able to measure and possibly increase the impact of pro-ethical actions.
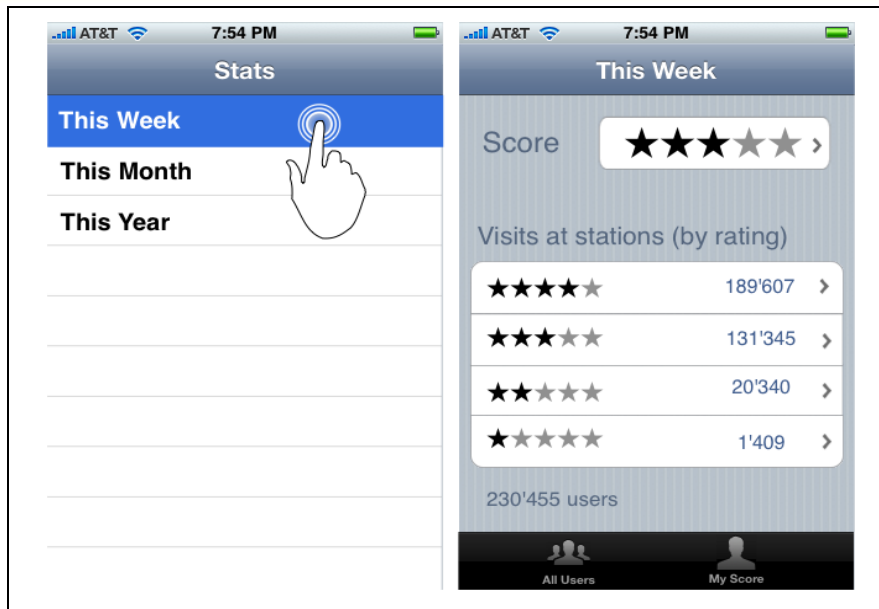
Figure 5. Measure Impact of Action

Table 3 presents an overview of the JustIS research questions raised in this section. It links them back to our Belief–Action–Outcome framework presented in Figure 1, along with suggestions for and examples of how information systems can possibly support each aspect of the framework.

Table 3: Motivating Questions Driving the Need for JustIS				
Link	What is it?	How can an IS help?	Existing examples	Research questions
Belief → Outcome	Describes how stakeholder values set ethical standards for a firm's behavior	Aggregating and disseminating stakeholders' ethical concerns to organizations	Smartvote PoliTap	RQ1
Outcome → Belief	Describes how the ethical behaviors of a company can raise awareness among stakeholders	Monitoring and reporting ethical behaviors of organizations to stakeholders	Good Shopping Guide Wikileaks SpillMap Ushahidi	RQ2
Belief → Action	Describes how stakeholder beliefs can trigger action	Facilitating stakeholders' pro-ethical actions, based on their ethical belief	Barcoo Shop Ethical Fair Fashion iTradeFair VisibleVote Catalista Touch To Give	RQ3
Action → Outcome	Describes how stakeholder action can impact firm's ethical behavior and outcomes	Aggregating individual behavior so that a direct impact on an organization's ethical behavior is noticeable and measurable	Bixi ChinaStrikes	RQ4

V. CONCLUSION

Ethical business processes are inherently hard to capture and to promote. Stakeholders' beliefs and actions can act as powerful levers to pressure companies to adopt ethical behaviors. We believe that information systems can be of great help when it comes to support those beliefs and actions. However, there is a lack of research investigating how to best design and devise such systems. Thus, in this article we have proposed a research program, termed JustIS, that aims at filling this gap. To allow a better understanding of the problem, we separated the types of systems into four categories, one for each link in the Belief–Action–Outcome framework: (1) systems that gather ethical concerns and convey them to companies, (2) systems that raise stakeholder awareness of a company's unethical behaviors, (3) systems that make it easy for stakeholders to undertake actions that pressure companies to rectify their behaviors, and (4) systems that allow interested persons to measure and increase the impact of

stakeholder actions. For each of these categories of systems we argue that researchers need to investigate what kind of characteristics these systems should exhibit in order to most effectively serve their purpose. We contend that if those questions, and the questions that arise with them, are addressed, the number of effective ethical systems could rise significantly.

REFERENCES

Editor's Note: The following reference list contains hyperlinks to World Wide Web pages. Readers who have the ability to access the Web directly from their word processor or are reading the article on the Web, can gain direct access to these linked references. Readers are warned, however, that:
1. These links existed as of the date of publication but are not guaranteed to be working thereafter.
2. The contents of Web pages may change over time. Where version information is provided in the References, different versions may not contain the information or the conclusions referenced.
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Adam, A. (2001) "Computer Ethics in a Different Voice", *Information and Organization,* (11)4, pp. 235–261.

Ajzen, I. (1991) "The Theory of Planned Behavior", *Organizational Behavior and Human Decision Processes,* (50)2, pp. 179–211.

Asif, Z. and H.K. Klein, (2009) "Open and Free Deliberation: A Prerequisite for Positive Design", *Information and Organization,* Designing Information and Organizations with a Positive Lens, (19)3, pp. 186–197.

Basu, K. and H. Zarghamee (2009) "Is Product Boycott a Good Idea for Controlling Child Labor? A Theoretical Investigation", *Journal of Development Economics,* (88)2, pp. 217–220.

Bonner, W. and M. Chiasson (2005) "If Fair Information Principles Are the Answer, What Was the Question? An Actor–Network Theory Investigation of the Modern Constitution of Privacy", *Information and Organization,* (15)4, pp. 267–293.

Cannoy, S.D. and A.F. Salam (2010) "A Framework for Health Care Information Assurance Policy and Compliance", *Communications of the ACM,* (53)3, pp. 126–131.

Charki, M.H. and E. Josserand (2008) "Online Reverse Auctions and the Dynamics of Trust", *Journal of Management Information Systems,* (24)4, pp. 175–197.

Chen, Y.-N. and I. Png (2003) "Information Goods Pricing and Copyright Enforcement: Welfare Analysis", *Information Systems Research,* (14)1 pp. 107–123.

Cleek, M.A. and S.L. Leonard (1998) "Can Corporate Codes of Ethics Influence Behavior?", *Journal of Business Ethics,* (17)6, pp. 619–630.

Coleman, J.S. (1986) "Social Theory, Social Research, and a Theory of Action", *American Journal of Sociology,* (91)6, pp. 1309–1335.

Culnan, M.J. and C.C. Williams (2009) "How Ethics Can Enhance Organizational Privacy: Lessons from the ChoicePoint and TJX Data Breaches", *MIS Quarterly,* (33)4, pp. 673–687.

Davis, F.D. (1989) "Perceived Usefulness, Perceived Ease of Use, and User Acceptance of Information Technology", *MIS Quarterly,* (13)3, pp. 319–339.

Delmas, M. and M.W. Toffel (2004) "Stakeholders and Environmental Management Practices: An Institutional Framework", *Business Strategy and the Environment,* (13), pp. 209–222.

Doan, A., R. Raghu Ramakrishnan and A.Y. Halevy (2011) "Crowdsourcing Systems on the World-Wide Web", *Communications of the ACM,* (54)4, pp. 86–96.

Eesley, C. and M.J. Lenox (2006) "Firm Responses to Secondary Stakeholder Action", *Strategic Management Journal,* (27)8, pp. 765–781.

Egels-Zandén, N. (2009) "TNC Motives for Signing International Framework Agreements: A Continuous Bargaining Model of Stakeholder Pressure", *Journal of Business Ethics,* (84), pp. 529–547.

Financial Crisis Inquiry Commission (2011) *The Financial Crisis Inquiry Report, Authorized Edition: Final Report of the National Commission on the Causes of the Financial and Economic Crisis in the United States Official, Government Edition*, Washington, DC: U.S. Government Printing Office.

Fleischmann, K.R. and W.A. Wallace (2005) "A Covenant with Transparency: Opening the Black Box of Models", *Communications of the ACM,* (48)5, pp. 93–97.

Floridi, L. (2011) "On the Morality of Artificial Agents" in Anderson, M., and S.L. Anderson (eds.), *Machine Ethics,* Cambridge, MA: Cambridge University Press, pp. 184–212.

Floridi, L. (2006) "Information Ethics, Its Nature and Scope", *SIGCAS Computers and Society,* (36)3, pp. 21-36.

Floridi, L. (2007) "Global Information Ethics: The Importance of Being Environmentally Earnest", *International Journal of Technology and Human Interaction,* (3)3, pp. 1–11.

Floridi, L. (2010a) *The Cambridge Handbook of Information and Computer Ethics*, New York, NY: Cambridge University Press.

Floridi, L. (2010b) "Network Ethics: Information and Business Ethics in a Networked Society", *Journal of Business Ethics,* (90)4, pp. 649–659.

Freeman, R.E. (1984) *Strategic Management: A Stakeholder Approach,* Englewood Cliffs, NJ: Prentice-Hall.

Friedman, B., P. Kahn Jr. and A. Borning (2008) "Value Sensitive Design and Information Systems" in Himma, K. and H. Tavani (eds.), *The Handbook of Information and Computer Ethics,* Hoboken, NJ: Wiley, pp. 69–102.

Frooman, J. (1999) "Stakeholder Influence Strategy", *Academy of Management Review,* (24)2, pp. 191–205.

Gopal, R. D. and A. Gupta (2010) "Trading Higher Software Piracy for Higher Profits: The Case of Phantom Piracy", *Management Science,* (56) November, pp. 1946–1962.

Guardian (2010) "Mobile Phone Barcode App to Help Ethical Shoppers", *The Guardian,* April 1. http://www.guardian.co.uk/environment/2010/apr/01/mobile-phone-app-barcoo-ethical (current Sep. 18, 2013).

Han, H., J. Hsu and C. Sheu (2010) "Application of the Theory of Planned Behavior to Green Hotel Choice: Testing the Effect of Environmental Friendly Activities", *Tourism Management,* (31)3, , pp. 325–334.

Harrington, S.J. (1996) "The Effect of Codes of Ethics and Personal Denial of Responsibility on Computer Abuse Judgements and Intentions", *MIS Quarterly,* (20)3, pp. 257–278.

Hemp, P. (2009) "Death by Information Overload", *Harvard Business Review,* September.

Hilton, T. (2000) "Information Systems Ethics: A Practitioner Survey", *Journal of Business Ethics,* (28), pp. 279–284.

Introna, L.D. (2002) "The (Im)possibility of Ethics in the Information Age", *Information and Organization,* (12)2, , pp. 71–84.

Introna, L.D. and N. Hayes (2011) "On Sociomaterial Imbrications: What Plagiarism Detection Systems Reveal and Why It Matters", *Information and Organization,* (21)2, pp. 107–122.

Iyengar S., R.C. Luskin and J.S. Fishkin (2003) "Facilitating Informed Public Opinion: Evidence from Face-to-face and On-line Deliberative Polls", Presented at Annual Meeting of the American Political Science Association, Philadelphia, PA.

Junglas, I.A. and R.T. Watson (2006) "The U-Constructs: Four Information Drives", *Communications of the Association for Information Systems,* (17)1, pp. 569–592.

Kaptein, M. (2004) "Business Codes of Multinational Firms: What Do They Say?", *Journal of Business Ethics,* (50), pp. 13–31.

Kaptein, M. (2008) "Developing a Measure of Unethical Behavior in the Workplace: A Stakeholder Perspective", *Journal of Management,* (34), p. 978.

Kazman, R. and H.-M. Chen (2009) "The Metropolis Model a New Logic for Development of Crowdsourced Systems", *Communications of the ACM,* (52)7, pp. 76–84.

King, B.G. (2008) "A Social Movement Perspective of Stakeholder Collective Action and Influence" *Business and Society,* (47)1, pp. 21–49.

Klein, J.G., N.C. Smith and A. John (2004) "Why We Boycott: Consumer Motivations for Boycott Participation", *Journal of Marketing,* (68), pp. 92–109.

Laufer, W.S. (2003) "Social Accountability and Corporate Greenwashing", *Journal of Business Ethics,* (43), pp. 253–261.

Lewis, P.V. (1985) "Defining 'Business Ethics': Like Nailing Jello to a Wall", *Journal of Business Ethics,* (4), pp. 377–383.

Mason, R.O. (1986) "Four Ethical Issues of the Information Age", *MIS Quarterly,* (10)1, pp. 5–12.

McGrath, K. (2006) "Affection Not Affliction: The Role of Emotions in Information Systems and Organizational Change", *Information and Organization,* (16)4, pp. 277–303.

Melville, N. (2010) "Information Systems Innovation for Environmental Sustainability", *Management Information Systems Quarterly,* (34)1, pp. 1–21.

Mingers, J. and G. Walsham (2010) "Towards Ethical Information Systems: The Contribution of Discourse Ethics", *MIS Quarterly,* (34)4, pp. 833–854.

Moldoveanu, M.C. and J.A.C. Baum (2011) "'I Think You Think I Think You're Lying': The Interactive Epistemology of Trust in Social Networks", *Management Science,* (57), February, pp. 393–412.

Management Excellence (2005) "Ethics in the Oil Industry", www.management-rating.com (current Sep. 18, 2013).

Moores, T.T. and J. Cha-Jan Chang (2006) "Ethical Decision Making in Software Piracy: Initial Development and Test of a Four-Component Model", *MIS Quarterly,* (30)1, pp. 167-180.

Palazzo, G. (2007) "Organizational Integrity—Understanding the Dimensions of Ethical and Unethical Behavior in Corporations", *Corporate Ethics and Corporate Governance,* New York, NY: Springer, pp. 113–128.

Parish, J. (2010) "PAPA Knows Best: Principles for the Ethical Sharing of Information on Social Networking Sites", *Ethics and Information Technology,* (12)2, pp. 187–193.

Peace, A.G., D.F. Galletta and J.Y.L. Thong (2003) "Software Piracy in the Workplace: A Model and Empirical Test", *Journal of Management Information Systems,* (20)1, Summer, pp. 153–177.

Protiviti (2011) "2011 Sarbanes-Oxley Compliance Survey—Where U.S.-listed Companies Stand: Reviewing Cost, Time, Effort and Processes", http://76.12.174.187/wp-content/themes/magazine/PDFs/2011SOXProtiviti.pdf (current Sep. 18, 2013).

Reuters (2007) "Sarbanes-Oxley Spending at $6 Billion in 2007", February 22, http://www.reuters.com/article/2007/02/22/accounting-sarbanes-spending-idUSN2217546720070222 (current Sep. 18, 2013).

Rodgers, W. and S. Gago (2004) "Stakeholder Influence on Corporate Strategies Over Time", *Journal of Business Ethics,* (52)4, pp. 349–363.

Ross, A. and M. Chiasson (2011) "Habermas and Information Systems Research: New Directions, Information and Organization", In press, corrected proof, available online July 1, 2011.

Sarkis, J., P. Gonzalez-Torre and B. Adenso-Diaz (2010) "Stakeholder Pressure and the Adoption of Environmental Practices: The Mediating Effect of Training", *Journal of Operations Management,* (28), pp. 163–176.

Shaw, D. and I. Clarke (1999) "Belief Formation in Ethical Consumer Groups: An Exploratory Study", *Marketing Intelligence & Planning,* (17)2, pp. 109–119.

Smith, H.J. (2002) "Ethics and Information Systems: Resolving the Quandaries", *SIGMIS Database,* (33)3, pp. 8–22.

Smith, H.J. and J. Hasnas (1999) "Ethics and Information Systems: The Corporate Domain", *MIS Quarterly,* (23)1, pp. 109–127.

Smith, H.J., S.J. Milberg and S.J. Burke (1996) "Information Privacy: Measuring Individuals' Concerns About Organizational Practices", *MIS Quarterly,* (20)2, pp. 167–196.

Stewart, K.A. and A.H. Segars (2002) "An Empirical Examination of the Concern for Information Privacy Instrument", *Information Systems Research,* (13)1, pp. 36–49.

Tsai, P.C.F, R. Yeh, S.-L. Wu and I.-C. Huang (2005) "An Empirical Test of Stakeholder Influence Strategy Models: Evidence from Business Downsizing in Taiwan", *International Journal of Human Resource Management,* (16)10, pp. 81–104.

van Huijstee, M. and P. Glasbergen (2010) "NGOs Moving Business: An Analysis of Contrasting Strategies", *Business & Society,* (49)4, pp. 591–618.

Wagner, E.L., S.V. Scott and R.D. Galliers (2006) "The Creation of 'Best Practice' Software: Myth, Reality and Ethics", *Information and Organization,* (16)3, pp. 251–275.

Watson, R.T., M.-C. Bourdeau, A. Chen and M. Huber (2008) *Green IS: Building Sustainable Business Practices, Information Systems,* Athens, GA: Global Text Project.

Willison, R. (2006) "Understanding the Perpetration of Employee Computer Crime in the Organizational Context", *Information and Organization,* (16)4, pp. 304–324.

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