Towards a Design Science of Ethical Decision Support

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Towards a Design Science of Ethical Decision Support

Abstract

Poor ethical decisions can destroy firms, jobs, and even lives. Ethical decision making involves complex emotional, cognitive, social, and philosophical challenges. It is truly a "wicked problem." The first step towards a design science of ethical decision support is to develop a theoretical base on which first-generation systems can be built. This paper brings together work in cognitive, social and moral psychology, information systems, and philosophy relevant to ethical decision making. Attributes of a system that would support ethical decision making are described.

Keywords: Ethics, philosophy, decision support systems, group support systems, emotion, cognition.

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Enron, WorldCom, Andersen, NBC - these are a few of the companies involved in recent ethics scandals (Aronson, 2002; Forbes, 2004; Rossiter and Thomson, 2004; York, 2004). Ethical failures have hurt customers, employees, investors, suppliers, creditors, and ordinary citizens.

Business leaders should be concerned. Unethical behavior can harm their companies, and they can be personally liable under legislation like the Sarbanes-Oxley Act of 2002. Some executives are trying to reduce the risks. A growing number of companies have ethics officers (Business Week, 2006), for example. Workplace misconduct, however, is widespread (ERC, 2005). Businesses, their leaders, their workers - and perhaps everyone - remain at risk.

Firms protect themselves in various ways. Some measures focus on people who would knowingly cause harm. For example, accounting controls detect fraud, and physical security deters theft. Other measures focus on the awareness, skills, and motivation of honest people through, for example, ethics training. Sometimes, top management leads by example, showing the importance it attaches to ethical behavior.

Information technology (IT) may be able to help. Computerized modeling and analysis tools, from spreadsheets to databases to data mining applications, improve decision quality (Forgionne and Kohli, 2000). They not only support computational methods, but also address the very human problems of group interaction (Benbasat and Lim, 1993). Could systems help improve ethical decision making? Searing (1998) created Ethos, a system that guides users through an ethical decision process. Mancherjee and Sodan (2004) found weak empirical support for its utility. Goldin, Ashley, and Pinkus (2001) built a Web-based system to help students learn about professional ethics. Robbins, Wallace and Puka (2004) found that IT support improved students'

ethical decision making. Chae, Paradice, Courtney, and Cagle (2005) offer guidelines for formulating ethical problems.

Many questions remain about ethical decision support in real companies. How do the attributes of decision makers (DMs) affect their choices? How emotionally charged do ethical discussions become? Can this damage valuable business relationships? Can people tolerate different ethical points of view? Can trust and group cohesiveness be maintained? What happens when employees in remote locations participate in ethical decisions? How can ethical decisions be structured? Can unscrupulous people manipulate ethical decisions? Can businesses set standards for ethical decision making? Can they help employees improve ethical decision making? Can they document ethical analyses? Can they reuse good analyses? If a company keeps records of ethical discussions, is it vulnerable to exploitative legal action?

This paper is a step towards a design science of ethical decision support. Design science is particularly appropriate for "wicked problems" (Hevner, March, Park, and Ram, 2004; Chae, Paradice, Courtney, and Cagle, 2005). Wicked problems are ambiguous, occur in complicated and ill-defined environments, and involve social interaction. Ethical decision making is particularly wicked. Centuries of research have not produced broad agreement among ethical theorists, let alone the general populace. Even basic terms like "ethics" and "good" do not have universal definitions. Further, ethics touches things that are central to human meaning, like religion, family, and justice.

The topic is so wicked that design scientists should take extra care. In particular, they should not create systems based on a superficial understanding of the problem. Ethos (Searing, 1998) was grounded in moral philosophy, but didn't consider people's psychological limits, group interaction problems, or the demands of real companies. Instead, researchers should build

on what is already known about ethical decision making. They should make good use of existing theory to identify potentially important constructs and models.

This paper lays the groundwork for building ethical support systems. It describes the context of ethical decisions, defines decision quality, examines impediments to quality, and outlines a system's main functions. Of course, the work reflects the author's biases. Arguably, there is no value-free position from which to consider ethics. Add issues of religion, culture, and personal history, and the possibility of unbiased research becomes increasingly remote. Perhaps all I can do is acknowledge my biases and allow for them, where possible.

I. THE CONTEXT OF ETHICAL DECISIONS

The following describes the situations this paper examines.

> **Individuals** and **groups** face a **problematic ethical situation**. They follow a **decision process** to make an **ethical decision**. DMs have **goals,** and work in constraining **environments**. They **use IT**. The **outcome is uncertain** at the start of the decision process. DMs are **not entirely selfish**, and are **not intentionally manipulating the decision process**. They work in a **Western culture**.

Some of this is straightforward. People work alone or with others. Decision processes unfold over time. DM's goals and social, technical, and other environments affect their behavior. Other things are not as clear. For example, what is an ethical situation? As an aside, business decisions have many facets. DMs think about costs, law, public relations… and, perhaps, ethics. It is more accurate to say that decisions have ethical aspects, rather than being purely ethical. That is the sense in which terms like "ethical decisions" and "ethical situation" are used here.

There are many ways to decide whether issues involve ethics. Perhaps issues are ethical when they significantly affect the welfare of people or other important things. Of course, we

need to define "significantly," "welfare," and "important things." Another possibility is that ethical issues involve values, that is, axioms like "life is good," "freedom is good," and "incest is bad." Of course, people do not weigh axioms equally.

In this paper, decisions involve ethical issues when people *think they do*. Recall that this work focuses on IT use in real companies. It is perception that prompts use, not reality. Of course, the logically consequent question is: How do people decide whether an issue is ethical? Jones (1991) held that six factors impact "moral intensity" perceptions. (1) Magnitude of consequences is the amount of harm or benefit at stake. (2) Social consensus is agreement on an issue's importance. (3) Probability of effect is an event's probability times its likely effect. (4) Temporal immediacy is the time between the decision and its consequences. (5) Proximity is the feeling of nearness DMs have for those affected. (6) Concentration of effect is whether an action's impact strongly affects a few people, or is diffused across a larger number. When these six factors apply, people attach ethical importance to situations.

This paper considers situations where DMs choose specific actions to address specific problems. It is not about general ethical ideas or hypothetical dilemmas. It is also assumed that DMs are making decisions, not justifying choices already made. If the outcome has been determined, it is not a "decision" process at all. Further, it is assumed that DMs are not entirely selfish and are at least at the second moral stage of Rest, Narvaez, Bebeau, and Thoma (1999) (more on this below). Someone concerned just for him- or herself rarely faces ethical decisions. His or her challenge is to maximize personal benefits, a problem in optimization, not ethics.

Most ethical decision research has been done in North America or Europe. It is not clear how much of it applies elsewhere. The discussion here is limited to decision making in Western cultures. It would be a mistake to think it must apply to other cultures.

These assumptions may seem overly constraining but, in fact, much is allowed to vary. DMs might not understand the situation. Their interpretation of it may change over time. The situation itself might change. DMs may leave the decision group. New DMs might join. DMs might not be colocated. Some DMs could be more powerful than others. DMs might not identify the best action. The action they choose might not help. They have limited time. In short, the business world's natural chaos is not assumed away.

Two more issues should be discussed. First, design scientists should consider how their tools might be misused. Unscrupulous people can manipulate decision processes. An ethical decision tool could make it easier. This paper normally assumes DMs are not intentionally manipulating decisions, but the assumption is dropped occasionally.

Finally, to simplify the discussion, this paper makes no distinction between ethics and morality. Philosophers often distinguish between them (e.g., Cline, 2005), but not always (e.g., Sibulkin, 1996). However, this paper is not a philosophical discourse, and most readers are not philosophers. Drawing fine distinctions between terms that are conflated in common usage (Cline, 2005) does not seem helpful.

II. ETHICAL DECISION QUALITY

What "good" means has been debated for many centuries. Some argue that philosophers have made little progress, compared to researchers in other fields (Robinson, 1921). Still, there are enduring ideas in Western thought. This section offers some background on this issue.

A. The Core of Moral Philosophy

There are many ways to decide "goodness." Utilitarianism is a teleological approach, focusing on outcomes (Pettit, 1991). The best choice gives the most utility for the most people. Recent arguments that torture can be moral rely on utilitarianism (Krauthammer, 2005).

Kant promoted deontology, or duty-based ethics (O'Neill, 1991). He said that "respect for persons" is a universal principle; people are ends in themselves, not just a means to one's advancement. Kant suggested that if an act is moral, one ought to evaluate it the same whether one is the actor, or the person affected by the act. A desire for justice, which Kohlberg (1976) thought was a basic moral motivator, can be seen as an aspect of this principle. Gilligan (1982) claimed that Kohlberg overemphasized justice. She wrote that for many people the principle of caring is more important than justice.

Virtue ethics focuses on DMs rather than decisions (Pence, 1991). Instead of asking "What should I do?", virtue ethics asks, "Who should I be?" Aristotle listed attributes that a virtuous person should have, including courage, temperance, generosity, friendliness, and magnanimity. Wilson (1993) listed sympathy, fairness, impartiality, self-control, taking the long view, courtesy, punctuality, and the habit of practice. The character education movement of the last few decades is based on virtue ethics (Lapsley and Narvaez, 2006).

Divine command ethics says that one should follow the dictates of a divine being, as given in the Torah, Bible, Koran, or other texts. Christianity's Ten Commandments are examples. Divine command ethics is important for two reasons. First, some companies are run along religious lines (Ibrahim, Rue, and Greene, 1991). Second, religion provides moral guidance for millions of people. Designers who ignore it risk making their products less useful.

How are these philosophies used in specific situations? Utilitarianism deals most directly with a situation's concrete elements: stakeholders and their evaluations of actions. Of course, many actions' outcomes are hard to predict, and stakeholder preferences are often unknown. To use deontology, one must select duties (e. g., justice), and ask how alternative actions rank on

each one. Conflicts will occur. Suppose a father steals to feed his children. Justice might require punishment. However, do the children receive justice if their father is jailed?

Virtue ethics is difficult to operationalize. Suppose a person thinks we should be honest and loyal. He or she hears a friend lie to a policeman. Should the person report the lie (honesty), or not (loyalty)? Similar problems attend divine command ethics, with additional complications from the existence of many texts that religious authorities interpret in different ways. Clearly, ethical theories are easier to describe than apply.

Apart from these philosophical approaches, there are heuristics that help evaluate ethical decisions. Some rely on social evaluation: Would you mind seeing your decision on the front page? Could you explain it to your children? Another heuristic depends on personal conscience: How do you feel when you look at yourself in the mirror?

The question of cultural relativism is important, especially for global businesses. Should an act be judged only according to the moral code of the culture in which it was performed, or are there trans-cultural moral imperatives? The respect-for-persons principle is a candidate for an absolute imperative. Of course, acceptance of cultural relativism is a continuum. While few Westerners would accept female genital mutilation simply because it is traditional in some cultures (Gibbs, 2003), more might accept local baksheesh customs.

Another important question is: Who are the stakeholders? One position is that firms have no obligations except to make a profit and obey the law (Friedman, 1970). Another view is that firms are embedded in society, receive its benefits, and have a duty to help maintain a sustainable social order. Still another view is that organizations do not exist. They are proxies for people: owners, managers, and workers. These people are responsible for their actions, including those done in the name of a company. The argument, "I was just maximizing shareholder wealth," has

the same moral weight as, "I was just following orders." Clearly, there is no agreed way to identify stakeholders. Just as clearly, DMs have to do it.

To sum up, moral philosophies offer ways to evaluate an action's rightness. There are useful heuristics, some based on these philosophies, and some not. People vary on their acceptance of cultural relativism and the way they identify stakeholders.

B. Decision Outcomes

The most obvious outcomes of an ethical decision flow from the choice itself, including things like impact on profits, liability, and reputation. Many companies have ethics policies (see Barton, 1995, for examples), but they are often ignored. Enron had a 64-page ethics manual (McLaughlin, 2003). It is difficult to enforce ethics codes. Ethical decision processes are rarely documented, and so are difficult to inspect. Further, selfish decisions can easily be justified in ethical language by, for example, weighting some virtues more than others.

Ethical decision processes have outcomes other than the decision itself. First, ethical discussions can highlight religious, cultural, and other divisions within a group. Carefully nurtured business relationships can be destroyed; Niederman, Beise, and Beranek (1996) found that professional meeting facilitators recognized this. Conversely, respectful discussions between open-minded people can strengthen relationships.

Second, decisions take time and money. The more thorough an analysis is, the more it costs. It is not feasible to calculate the optimal cost accurately; for example, the effects of actions are not known in advance, and the value of actions not taken will never be known with certainty. Still, ethical decision processes should be efficient, not consuming resources unnecessarily.

Third, it may be possible for ethical analyses to be reused. Arguments for the cost effects of software reuse (e.g., Poulin, Hancock, and Caruso, 1993) will be familiar to many readers. If an ethical analysis was documented, it may be reusable.

Finally, ethical decisions should improve over time as DMs learn. An individual DM should be more effective in his or her fifth decision than the first. A DM could read about other DMs' decisions. The company could select particularly good analyses, and use them in training.

C. Choosing a Perspective

Since this paper is about ethical decision support, not ethics *per se*, all decision methods commonly used in the West should be supported. Further, DMs should be helped to use those methods well. For utilitarianism, for example, this means helping DMs identify alternatives and evaluate them completely (i.e., consider all of them) and consistently (i.e., treat them equally). The word "disciplined" will be used to refer to the complete and consistent use of one or more ethical reasoning methods.

In this paper, an ideal ethical decision process:

> applies **articulated moral ideas**, is **disciplined**, is **not affected by individual or group biases**, has **not been manipulated**, is **consistent with organizational values**, **improves relationships**, **helps DMs learn**, is **inexpensive**, can be **documented**, and can be **reused**.

Of course, decision processes will rarely achieve this ideal. There will be tradeoffs. For example, some relationship damage might be necessary to achieve a result that cleaves to a firm's preferred ethical code. Still, the statement can help guide the design of ethical decision support.

III. FACTORS AFFECTING DECISION QUALITY

This section considers factors that would prevent DMs from enacting an ideal process. Characteristics of ethical situations, DMs, groups, organizations, social environments, and technology will be discussed.

A. Ethical Situations

Is the ideal process harder to attain in some situations than others? Campbell (1988) wrote that task complexity depends on the number of outcomes and solutions, whether there are conflicts between solutions, and uncertainty about solution outcomes. Task complexity levels range from simple to fuzzy. Simple tasks have one outcome, one solution, no conflicts, and no uncertainty. Fuzzy tasks have uncertain outcomes and conflicting solutions. DMs with fuzzy tasks spend much effort just understanding and structuring the problem (Zigurs and Buckland, 1998).

How complex are ethical tasks? Consider this example. Though fictional, it is typical of real situations (see Barton, 1995, for many real examples):

> AlVac makes vacuum cleaners for allergy sufferers. Its factory is in a small rural town. AlVac is the only major employer in the town, and enjoys significant tax discounts. AlVac's main customer is XamMart, a large retail chain that buys 30% of the AlVac's output. XamMart demands a 25% price cut over the next three years, or it will stop buying from AlVac. AlVac's production manager thinks the only way to do this is to both use lower quality parts, and move production overseas. What should AlVac do?

This case has several outcomes (profits, jobs, etc.), several conflicting actions (move all or some production overseas, drop XamMart, etc.), and uncertainty (e.g., if AlVac dropped XamMart, could it find other customers?). This is a fuzzy task in Campell's (1988) scheme.

Moral philosophers and psychologists have paid special attention to an aspect of Campbell's (1988) definition: solution conflicts. A problem that sets right against right, or wrong against wrong, is called an ethical dilemma. Suppose DMs have two mutually exclusive choices. If one is right and the other wrong, there is no dilemma, only temptation. If both are right, it is

necessary to give up one right for the other. This is the essence of the abortion debate, pitting life (something most people value) against freedom (something also valued). Assisted suicide pits suicide (which most would say is bad) against terminal suffering (another bad thing). Kidder (1996) writes that some dilemmas are particularly common in business: truth vs. loyalty, individual vs. community, short-term vs. long-term, and justice vs. mercy.

Besides complexity, tasks can be classified as intellective or judgmental (Laughlin, 1980). Intellective tasks have a correct solution. There are no demonstrably correct answers for judgmental tasks, only preferences. Not surprisingly, Kaplan and Miller (1987) categorize ethical choices as judgmental tasks.

Uncertainty adds to complexity. Daft and Lengel (1986) differentiate uncertainty from equivocality. Lack of information causes uncertainty. For example, AlVac doesn't know whether XamMart will accept a 15% cost reduction, because XamMart won't say. Equivocality means there are conflicting interpretations of the situation, even though the facts may be agreed. For example, does AlVac have a duty towards its workers, or is their relationship a simple economic exchange? Ethical problems typically involve both uncertainty and equivocality.

B. Individuals

This section considers attributes of individual people that make the ideal decision process difficult to achieve. Attributes of social interaction are discussed later.

1. Emotion

Every experience has emotions associated with it (Damasio, 2003). Somatic marker theory says that when our brains store information, they automatically tag it with our emotional state at that moment (LeDoux, 1996). We constantly use this data. For instance, we predict the effects of

a decision by recalling emotions associated with similar experiences. This happens automatically and can bias our evaluation of a person, action, thing, or other mental object.

Emotion and cognition affect each other. Strong emotional responses can overwhelm cognition (Derryberry and Tucker, 1992) causing people to act in ways that surprise their rational selves. On the other hand, cognition modifies emotion (Plutchik, 2001; Wilson, 1993). For example, a supervisor might be angry on learning that an employee left the workplace during business hours. Praise could replace anger if the supervisor learns that the employee was helping an important customer with an emergency.

Some emotions are particularly relevant here. Empathy, where someone imagines the emotions of others (Hoffman, 2000), helps people classify situations as morally relevant (Rest et al., 1999). However, empathy is short lived and subject to cognitive interpretation (Wilson, 1993). For example, someone's empathy for a boy bitten by a dog might vanish upon learning that the boy was cruelly beating the animal.

Other emotions are important as well. Those seeing exceptional virtue might experience awe, (Keltner and Haidt, 2003), and change their ideas about what is ethically possible. Haidt and his colleagues have also studied elevation (Haidt, 2000) and social disgust (Haidt, McCauley, and Rozin, 1994). Elevation, a warm feeling induced by watching a positive act, can increase one's desire to affiliate with and help others. Seeing a negative act can induce social disgust. Its bodily signs are like those of physical disgust, as with rotten meat. Fear and guilt can prevent behavior that could harm the perpetrator and other people (Wilson, 1993).

Fear makes people easier to convince (Leventhal, Singer, and Jones, 1965). Herman Goering knew this. He said, "Of course the people don't want war… All you have to do is tell them they are being attacked, and denounce the pacifists for lack of patriotism …" (Gilbert,

1947). This quote underscores the potential effects of manipulation. World War II was the deadliest conflict in history.

Emotional distortions are automatic, and often suppress the cognitive capacity we might use to control them. One approach to control is mindfulness (Langer, 1989), where people monitor their own emotions, suppressing inappropriate responses before cognition is overwhelmed. Mindfulness is discussed in more detail below.

2. Cognition

People make systematic errors because of the way our brains use information. As with emotions, these processes are largely automatic, and not readily accessible to our conscious minds (Narvaez, 2002). This section considers a number of these cognitive biases.

Availability errors occur when our environment is selective in the information it presents, and we are selective in storing it (Tversky and Kahneman, 1973). For example, many people might think there are more murders than suicides in the United States. In fact, there are about 1.5 to 2 suicides for every murder (Statistical Abstracts of the United States, 2002). We remember more murders than suicides, because murders appear more often in the media, and murders are more salient (a murderer is a potential threat, while a suicide is not).

Schemas are mental templates (Narvaez, 2002). For example, someone's schema for "a religion" might include gods, worshippers, and rites. Schemas are learned directly (e.g., from parents), or from experience. They help us understand situations from a few scattered clues. For example, someone learning that Hinduism is a religion expects it to have gods, worshippers, and rites. Possessing many schemas and using them well makes experts more effective than novices (Alba and Hutchinson, 1987). However, racial stereotypes are also schemas (Kunda, 1999).

Some schemas are about causes of events. People automatically try to find causal patterns in event sequences, sometimes leading to illusory correlations. Illusions of control occur when we think we have more control over situations than we really do (Kunda, 1999).

Attribution error (Jones and Nisbett, 1971) is another type of bias. People often attribute their successes to their own attributes (intelligence, hard work), and their failures to luck (the weather, the lighting). On other hand, we easily attribute other peoples' successes to luck and failures to their attributes. Ross and Ward (1996) argue that attribution errors are failures to construe situations. They suggest that if one person sees another acting in a way that seems morally wrong, it is more likely that the other's perceptions, assumptions, and associations are different, not his or her basic character. In fact, it may be impossible to see things from another's viewpoint without being that person. Perhaps the challenge is to accept that one can be wrong.

Further, people tend to notice and accept information that is consistent with their beliefs more easily than information that is not consistent (Kunda, 1999). In other words, they accept information their schemas tell them to expect (Jones and Nisbett, 1971). They may not even notice unexpected information; it becomes part of the background clutter our minds ignore. Even when such information is forced into attention, it is usually easier for us to dismiss it than to adjust our schemas, particularly when the schemas are associated with core values.

Finally, when choosing from alternatives, DMs often take the first one that is minimally acceptable. This is called satisficing (Byron, 1998). It reduces DM effort and, therefore, the decision's cost for the company. A little more effort, however, may have revealed better alternatives. Satisficing is not always good or always harmful. It depends on the situation.

3. Goals

Moral orientation is a general moral schema. Rest et al. (1999) identify three schemas, derived from Kohlberg's (1976) work. "Personal interests" says people should try to get what they

want (Narvaez, 2002). "Maintaining norms" says people should follow rules set by legitimate authorities. Fairness means using the same rules for everyone. The "post-conventional" schema emphasizes moral principles. Neither the DM's interests nor social norms take priority over moral ideals. Hogan (1973) suggested there are two basic types of ideals: teleological and deontological. These concepts were discussed earlier.

Moral self-relevance is the extent to which someone's moral position is central to his or her identity (Gibbs, 2003). Colby and Damon (1995) studied 23 moral exemplars (people living outstanding moral lives). Their moral goals were tightly bound up with their images of themselves. Although observers would have said many of them were sacrificing much for their moral goals, they did not see it that way. Material comforts were not particularly important, so losing them was not a sacrifice. With few exceptions, the exemplars reported living satisfying lives. Moral goals often conflict with other goals, like security and social acceptance. The more salient moral goals are, either because of moral self-relevance or external priming (Kellaris, Boyle, and Dahlstrom, 1994), the more effect they will have on decision making.

It is difficult to predict how someone will prioritize goals. Circumstances often override an individual's general preferences. Darley and Batson's (1973) study illustrates this. The subjects were seminary students. They began the experiment in one building, and walked to a second building to continue. Some were told they were late for the next task, others that they had a few extra minutes. On the way to the next building, they encountered a man slumped in an alleyway, who moaned and coughed as they passed. Almost two-thirds of the subjects who were not in a hurry helped the man, yet only one in ten of the subjects who were in a hurry helped. Clearly, good intentions can be overridden by circumstances.

4. Personality

Personality is a set of stable dispositions. Recent work suggests that personality influences thought and behavior (Barrick, Mount, and Judge, 2001), but is easily overwhelmed by situational factors (John and Srivastava, 1999). Researchers often use the "big five" personality dimensions (John and Srivastava, 1999):

- Neuroticism - emotional stability vs. negative emotionality
- Extraversion - an energetic approach to the world vs. a passive approach
- Openness - openness to experiences vs. close-mindedness
- Agreeableness - prosocial, cooperative orientation towards others vs. antagonism
- Conscientiousness - control of impulses vs. lack of control

How does personality affect ethical decision making? Openness correlates with Kohlberg's (1976) moral reasoning levels (Cawley, Martin, and Johnson, 2000). Vengefulness is positively related to neuroticism and negatively to agreeableness (McCullough, Bellah, Kilpatrick, and Johnson, 2001). Moral exemplars tend to be conscientious and agreeable (Walker, 1999). Openness does not predict task performance in general (Burke and Witt, 2002). However, it might be important in ethical decision making, since understanding different values may help with empathy and attribution. Further, racial prejudice is negatively related to openness (Flynn, 2005; Ekehammar and Akrami, 2002) and agreeableness (Ekehammar and Akrami, 2002).

Personality differences also affect the way people work together. Conscientiousness, agreeableness, and (lack of) neuroticism predict performance in jobs requiring interpersonal work (Mount, Barrick, and Stewart, 1998; Skyrme, Wilkinson, Abraham, and Morrison, 2005).

5. Mindfulness

The discussion above is not optimistic about our capacity to make good ethical decisions. Hope lies in our ability to think about our own thinking. Consider racial prejudice. Retrieving racial schemas from memory is inevitable; that is how the mind works. We do not, however, need to *act on* them (Kunda, 1999). DMs encountering people of another race might retrieve negative racial stereotypes, and then deliberately suppress them. Similarly, if a frequency estimate (e.g., murders vs. suicides) is important to a decision, DMs can look it up, rather than rely on biased intuitions. If DMs have strong emotional reactions, they can ask themselves whether they are justified. They might delay further work, until equanimity has been restored. DMs might consciously look for disconfirming or unexpected information. They could also ask themselves whether an action is consistent with company and personal moral goals.

The word "mindfulness" captures the general idea of self-knowledge, awareness of other perspectives, openness to new interpretations, and attending to the present (Butler and Gray, 2006; Langer, 1989). Mindfulness affects performance. For example, a 40-year study of 450 boys found that their ability to handle frustration, control emotions, and get along with others better explained their personal and workplace success than did IQ (Snarey and Vaillant, 1985).

Mindfulness overlaps with emotional intelligence (EI), the ability to understand and use emotional information (Salovey and Mayer, 1990). EI includes skills to identify emotions, use them to help thinking, understand emotional meanings, and manage emotions. EI and the personality traits of openness and agreeableness are correlated (Stys and Brown, 2004). Mindfulness goes beyond EI, in that it also includes awareness of cognitive issues.

Note that "mindfulness" is used in various ways. For example, Butler and Gray (2006) focus on awareness of tasks and goals, and its effect on system reliability. In this paper, mindfulness refers to cognitive, emotional and social awareness of self and others. Central to all

mindfulness definitions is the notion of attending to the present and trying to understand the deep causes of phenomena, rather than simply reacting in a routine way to surface impressions.

Mindfulness is not innate, but manifests itself as a skill set. If poor EI prevents someone from being an effective team member, training may reduce the problem (Stys and Brown, 2004). Further, mindfulness can develop over time; people are more able to be mindful as they mature (Kegan, 1994). However, mindfulness training isn't always successful (Teasdale, Segal and Williams, 2003). It is most effective when trainers have an explicit model of the effects of mindfulness on a behavior and communicate the model to trainees.

Good decision making requires not only mindfulness, but also motivation and opportunity. DMs who are motivated to make good decisions might exert effort to correct biases. Their organizations also must give them the time and tools to make good decisions. Good decisions also require that DMs be honest with themselves. DMs who do not allow for their own fallibility would not be effective participants in the ideal ethical decision process.

C. Groups

Groups of DMs generate more information and alternatives than individual DMs and are better at evaluation and error detection (Nunamaker et, al., 1991). Unfortunately, groups often do not work smoothly. This section considers how IT can help. First, the outcomes of group work are considered. The decision is the most obvious, but there are others, like relationship building. Second, factors affecting group performance are examined, including power asymmetry, trust and cohesiveness, and conflict. Along the way, we will consider the effects of communication distance, asynchronicity, and other artifacts that GSS introduce.

1. Outcomes

A group decision process has outcomes besides the decision. First, DM's perceptions of each other can change. A DM might downgrade his or her beliefs about another's expertise, for example. DMs also can manipulate the way others see them (Sutton and Hargadon, 1996). For instance, a DM wanting to appear "tough" might propose an action yielding slightly more profit than another action, at the expense of environmental destruction.

Second, relationships between DMs can change. DMs try to maintain the well-being of the group, and support each other emotionally (McGrath, 1991). In fact, the continued preference for paper-and-pencil brainstorming over IT-supported brainstorming, despite evidence that the latter is more productive, may be because IT-supported brainstorming is less conducive to group well-being and member support (Dennis and Reinicke, 2004).

Participating in ethical decisions can also help DMs better understand themselves. Educators use values clarification exercises to help people think about their values, and learn about others' values (Simon, Howe, and Kirschenbaum, 1978). Values clarification has been criticized for encouraging moral relativism (Wilson, 1993). Nevertheless, the exercises do help people better understand their values, and that is important in moral development (Liszka, 2002).

Another outcome is that DMs and firms might better understand the decision process. When decision projects end, DMs should consider how the process might be improved (Beranek et al., 2005). Sharing these ideas will help people both inside and outside the group.

If the process is documented, parts of it could be reused. In the AlVac case, the company might have examined its ethical responsibilities. This analysis could be reused in the future. Of course, in each case AlVac should decide whether the analysis still applies.

Finally, decisions set precedents. If AlVac decided to send production overseas, outsourcing IT would be easier to justify. Similarly, if AlVac dropped XamMart, it would establish a precedent of independence from important customers.

Reuse and precedence are not the same thing. Reuse is largely motivated by economic concerns. A decision not to reuse old software does not imply anything about ethical values. Precedence has a more judgmental flavor. If a precedent is not applied, questions naturally arise. Was the earlier decision the right one? Has the situation changed? Have values changed?

2. Issues Affecting Outcomes

a) **Power Asymmetry.** Powerful DMs or cliques can dominate groups, making others hesitant about stating their viewpoints (Shaw, 1981). Having group members from different levels in a firm's hierarchy is one cause of power differences (Brass, 2002). Hollingshead (1996) reported that mixed-status groups made poorer decisions than equal-status groups. Powerful group members participate more than the less powerful, in both face-to-face (F2F) and computer-mediated communication (CMC) (Weisband, Schneider, and Connolly, 1995). More differences between F2F and CMC are examined below.

A person can have power in some situations but not others (Brass, 2002). French and Raven (1960) defined five sources of power. Those with reward power mete out positive or negative consequences. People with coercive power can punish those not meeting expectations. Those with formal organizational authority have legitimate power. Those who associate with powerful people can get referent power. People with expert power have important knowledge or skills. Charisma is another source of power that is not in French and Raven's list (Brass, 2002).

Anonymity helps overcome power differences. People working anonymously are more likely to criticize ideas, ask questions, and add their own thoughts (Jessup, Connolly, and

Galegher, 1990). Anonymity has a dark side. People are more willing to deliver electric shocks to others when doing so anonymously (Zimbardo, 1969). Anonymity also can lead to deindividuation, where someone's values are suppressed by his or her role. Zimbardo's prison study gives an example (Zimbardo, 1973). Subjects were randomly given the role of prisoner or guard in a simulated jail. People in both groups came to live their role to callous extremes.

Personal responsibility can be diffused in other ways as well. Bandura (1990) suggests that terrorists often see themselves as patriots doing others' bidding. People who take hostages put responsibility for the hostages' lives in their adversaries' hands. Ordinary people will torture others, if asked by an authority figure (Milgram, 1951). Compliance is reduced, however, if courageous peers object, or the authority figure's power is called into question.

Anonymity also makes social loafing easier, where people let others in the group do the work for them (Jessup et al., 1990; Nunamaker et al., 1991). Again, responsibility is diffused across the group. People also tend to work harder when they know they must defend their work to others (Kunua, 1999). In an IT context, the socially detached nature of most CMC lets people write things they wouldn't say face-to-face (Alonzo and Aiken, 2004). Flaming, sending messages that are deliberately hostile, is easier when done anonymously (Sproull and Kiesler, 1986). Barkhi, Jacob, and Pirkulb (2004) suggest the low social presence of remote DMs in a distributed group may make them feel less responsible for their actions.

Judicious use of power can improve ethical decision quality. For example, a powerful group member can insist that the decision process be disciplined, set a tone of respectful communication, and encourage participation from all, including remote DMs. Much depends on what results the powerful individual wants. He or she can help the group make the best decision, or the

decision that is in his or her best interests. It can be argued that while every group member is responsible, powerful group members are more so.

b) **Trust, Cohesiveness, and Norms.** Trust is a "willingness to be vulnerable to … another party" (Mayer et al. 1995, p. 712). Trust affects collaboration (Jarvenpaa, Shaw, and Staples, 2004). For example, someone getting a seemingly harsh message from a trusted person might not instantly assume hostile intent. He or she may contact the sender for clarification. This could be important in ethical work, since it often involves equivocal and emotionally laden language.

People meeting for the first time may already trust each other (Jarvenpaa et al., 2004) because they belong to the same firm, church, or alumni group. Working on ethical problems complicates this. DMs cannot necessarily infer each other's values from their group memberships. Two people might work for the same firm, but not have the same ethical commitments.

Trust-building is especially important early in a project (Jarvenpaa, et al., 2004), when misunderstandings are most likely. Alignment between words and deeds also affects trust (Simon, 2002). Geographically remote DMs who do not get prompt feedback to messages can become less trusting (Jarvenpaa et al., 1998). They may feel shut out of conversations. However, F2F interaction can rebuild relationships with remote DMs (Armstrong and Cole, 1995).

Trust builds cohesion, a perception that a group has an identity apart from its individual members (Fiol and O'Connor, 2005). Teams that see themselves as a unit with a common goal communicate better and are more effective (Maznevski and Chudoba, 2004). Cohesion has been linked to higher motivation and job satisfaction, lower attrition, lower conflict, and greater compliance (Kramer, 1991). Visible signs of group identity, like an official name, enhance cohesion (Ashforth and Humphrey, 1995). Clearly defining roles can also help (Fiol and O'Connor, 2005), as can well-articulated goals and norms (Armstrong and Cole, 1995).

High group cohesion may have drawbacks. One effect relevant to ethics is that highly cohesive groups tend to see other people as less worthy than themselves (Wilson, 1993). The more cohesive the group, the stronger this effect is. It could be that having less empathy for out-group people than in-group people biases ethical decision making.

Member diversity affects group cohesion. Diverse groups can produce more ideas than homogeneous groups (Daily, Whatley, Ash, and Steiner, 1996). However, moral diversity can reduce peoples' desire for interaction (Haidt, Rosenberg, and Hom, 2003). Demographic diversity can split a group, polarizing it along social "fault lines" and politicizing communication (Fiol and O'Connor, 2005). These effects diminish when DMs share goals, have frequent contact, know each other well, and view each other positively (Triandis, 1994).

Distributed teams can have trouble building relationships and creating a group identity (Hinds and Bailey, 2003). Their different social contexts can result in different beliefs about appropriate behaviors. The time delayed and incomplete nature of much CMC can make things worse. For example, a DM not copied on an email may not only be working with incomplete information (Cramton, 2001), but not feel part of the group.

Groups have norms, tacit or explicit rules governing behavior. Norms are a form of power in that they restrict what group members do, but are enforced by peers and cultures, not by powerful individuals. It is difficult to underestimate the power of norms, as Asch (1951) showed. He asked peer groups to report a line's length. In some groups, all but one person was Asch's confederate. Sometimes all of the confederates would give the same, obviously wrong, estimate. Many subjects went along. If some people conform to group norms on things as unequivocal as line length, how would they react to ambiguous ethical issues?

At the start of a group's life, norms might come from company and local cultures. Remote DMs might be used to different norms. The greater the differences, the more important it is that team leaders continue to address norms (Beranek, Broder, Reinig, Romano, and Sump, 2005). F2F communication is generally better for this than CMC (Kiesler and Cummings, 2002).

There can be norms for many things, including IT use (DeSanctis and Poole, 1994). Technology can reinforce norms. For example, artifacts like spreadsheets can be stored (Paul, Haseman, and Ramamurthy, 2004), perpetuating the norms in force when they were created.

Norms can have odd effects. The Abilene Paradox (Harvey, 1988) is one. Returning to AlVac, suppose its management had a norm of being "business tough," focusing on the bottom line, no matter what. An AlVac DM might suggest closing the local plant, not because he or she thinks that will maximize profits, but to show everyone how little he or she cares about employees or the community. Everyone else might go along, so they can appear tough as well. Secretly, they might *all* think that searching for alternative markets would be more profitable. The plant would be closed, even though not a single person thinks it is the right thing to do.

Finally, some firm's norms preclude GSS use (Olson and Olson, 2000). There is little point in giving collaborative systems to people who do not collaborate. For example, if AlVac's sales representatives do not share information, technology that facilitates sharing will have little value.

c) **Presence and Awareness.** Trust and cohesion require that DMs be aware of each other. Weisband (2002) identified four types of awareness: activity (knowing what other DMs are doing), availability (knowing when they can participate), process (knowing how each DM's work serves the overall goal), and social (knowing about DMs as people, e.g., what they do outside work). People working F2F have ready access to this information, but CMC filters out cues that build awareness (Culnan and Markus, 1987), such as facial expression, direction of looking, and

posture (Short et al., 1976). Without them, messages can lose their social context (Olson and Olson, 2000). Nardi and Whittaker (2002) suggest that F2F interactions like touching and eating together form a common experience that CMC will never match. This may be why Cappel and Wilson (2000) found F2F communication more effective for ethical decision making than CMC.

Some tasks lend themselves more to F2F than to CMC (Dennis and Valacich, 1999). F2F and CMC support idea generation (e.g., brainstorming) tasks equally well (Murthy and Kerr, 2003). When DMs generate ideas independently, they need not look at the same information or agree on what it means. However, making a joint choice is a convergent task. DMs attend to the same information and negotiate its interpretation. This requires back-and-forth interaction. DMs using F2F perform this task better than those using CMC (Murthy and Kerr, 2003; Huanga, Weib, and Tan, 1999). Interactivity lets people quickly exchange information, easily signal understanding or confusion, correct misinterpretations, and allow for questions or interruptions (Kraut, Galegher, Fish, and Chalfonte, 1992).

Ethical decision making can benefit from the rapid back-and-forth conversation that helps resolve ambiguity (Olson and Olson, 2000). Global business means that sometimes neither F2F nor synchronous CMC meetings are feasible.

There are ways to improve CMC richness, such as emoticons (Chenault, 1998) and hapticons (Rovers and van Essen, 2004). Hapticons are small force or vibration patterns used to send emotional information via touch. Erickson, Smith, Kellogg, Laff, Richards, and Bradner (1999) describe a social proxy, a graphical indicator of who participates in a chat session and how much they contribute. Alternatives range from simple lists of who is online to sophisticated graphical models of interaction (Bradner, Kellogg, Erickson, 1999; Donath and Viégas, 2002).

Video conferencing approaches F2F's richness. Video can improve task performance (Baker, 2002), and people generally prefer video to text-only communication (Olson, Olson, and Meader, 1995). Bos, Gergle, Olson, and Olson (2001) found that video interaction allowed cooperation to develop in a social dilemma game, while text did not. However, video could impede ethical decision making. DMs tend to think that beautiful people are more socially competent and even somewhat more intelligent than others (Eagly, Ashmore, Makhijani, and Longo, 1991), although they do not think that beautiful people possess more integrity, or are more caring. The impact of attractiveness on decision making requires further study.

d) **Conflict.** Group conflict is usually dysfunctional, but it can be beneficial if it helps groups consider more alternatives and evaluate them more thoroughly (Hinds and Bailey, 2003). Of course, the danger is that such conflict splits groups. Communication must remain open, respectful, and collaborative for conflict to be useful.

The way conflict is handled is important. Trust can increase if conflict is handled openly and without rancor (Hinds and Bailey, 2003). People are less likely to avoid important issues if they think that conflict will not be destructive. Records of earlier decisions can show how conflict was handled in the past, and can guide the solution of present conflict (Paul et al., 2004).

e) **Leading and Managing Decision Processes.** Leaders create organizational contexts for decision making. They influence reward systems, norms, goals, physical spaces, and so on. Second, when part of a decision team, leaders influence group behavior directly, changing norms, group identity, cohesiveness, and conflict handling. Technology can support leaders. A leader who wants to know what DMs really think could use a GSS's anonymous voting features. A leader who wants DMs to express a certain opinion can have the anonymity features turned off. A GSS is just a tool. By itself, it would not overcome poor or manipulative leadership.

Transformational leadership is appropriate for ethical decision making teams (Bass and Steidlmeier, 1998). Transformational leaders show DMs why their tasks are important, encourage them to put team goals before self-interest, and attend to DMs' higher-order needs, like achievement and self-actualization. Transformational leadership yields more effort from employees, better group performance, and higher employee satisfaction (Stys and Brown, 2004). One of the leader's tasks is to select communication methods (Nardi and Whittaker, 2002). If CMC is used, structured and clear leadership is particularly important (Armstrong and Cole, 2002).

Leaders should encourage discipline in decision making. Focusing groups on one part of a task at a time increases performance (Dennis, Aronson, Heninger, and Walker, 1999). Similarly, groups make better decisions when using structured rather than unstructured chat sessions (Farnham, Chesley, McGhee, and Landau, 2000). Computerized decision tools can help DMs stay focused on the task at hand (Tryan et al., 1992).

There are also prosaic issues like group size to consider. People prefer small groups (Shaw, 1981), since participation is more equal than in large groups. On the other hand, CMC makes it possible for many people to contribute their expertise (Tryan et al., 1992). As discussed below, having different roles on the team is a potential solution.

D. Organizations

Ethical climates affect employee decision making (O'Fallon and Butterfield, 2005), perhaps more than individual characteristics (Banerjee, Cronan, and Jones, 1998). Employees of firms with ethical codes, supportive statements from top management, and penalties for misconduct are more likely to make ethical choices than employees of other firms (Laczniak and Inderrieden, 1987). Not all ethics codes are equal, however. Schwartz (2004) lists empirically derived facets of good codes, including readability, using examples, and a reporting requirement.

Ethics policies must be acted upon for employees to take them seriously (Trevino, Klebe & Weaver, 2001). However, these policies compete with other goals. For example, pressure to perform can increase unethical behavior (Robertson and Rymon, 2001). Another complication is that "ethical microclimates" can exist within a firm. Although top management might want ethical behavior, middle managers can create different norms within their own units.

Finally, companies need DMs who can make good ethical decisions. At a minimum, firms should invest in mindfulness. The benefits include not only more ethical decisions, but increased sales, reduced turnover, and so on. In fact, while the concept of mindfulness is usually applied to individuals, it can be applied to firms as well (Butler and Gray, 2006). Mindful companies attend to their operations, try to understand failure, and make themselves more resilient. It may be that mindful firms are more likely to see the value of ethical decision support, but this is speculation.

IV. SUPPORTING ETHICAL DECISIONS

What should an IS for ethical decision making look like? Before moving on, consider how DMs would use the tool. Some systems determine user behavior. The IS a bank teller uses to withdraw cash does not give its user much choice in how to do it. There should not be too much creativity in such transactions. An ethical decision support system (EDSS) is different. We cannot define ethical decision methods precisely. The process should change with task difficulty, DM personality and mindfulness, group norms, cultural differences, and so on.

The guiding metaphor for an EDSS is a toolbox. People select tools and use them as they wish. Of course, the EDSS could help guide users with information sequencing, help messages, and processing advice (Silver, 1991; Carlson, Carlson and Wadsworth, 1999). However, an EDSS should not force users along a single path from a known beginning to a deterministic end.

A. High-Level Model

Figure 1 shows the process being supported. The main task is choosing an action. Three other tasks support choice. First, DMs must understand the situation, learning about stakeholders' needs, resource constraints, etc. They elaborate thin problem descriptions, paying special attention to understanding the problem. The second task in is analysis. In principle, DMs could choose one method - utilitarianism, deontology, virtue, divine command, or something else - and apply it. In practice, DMs are likely to mix-and-match various techniques (Thong and Yap, 1998; Robbins, Wallace and Puka, 2004). The third task is to explain the decision.

B. Developing Effective DMs

DMs must be ready for the tasks in Figure 1. Prepared DMs should be mindful. They should know what their emotional and cognitive biases are, and be able to detect and ameliorate them. For example, DMs should know what availability biases are, and be ready to seek accurate information when needed. For communication tasks, DMs should take both the sender's and receiver's perspectives. For example, DMs would try not to make comments others might interpret as offensive. Conversely, they would not assume that offensive comments made by others were meant that way. DMs would try to include everyone in the discussion. If omitted from a discussion, they would not automatically assume that it was intentional. DMs would monitor their own use of negative stereotypes and be ready to help other DMs handle theirs. If someone else suggested that a DM was using a negative stereotype, the DM would control his or her angry emotional response, and try to consider things dispassionately. DMs should have appropriate goals. They should want to make a good decision rather than, for example, just complete the job quickly. They should also be open, agreeable, and conscientious. If they are going to use virtue ethics, DMs should have thought about the virtues they consider desirable.

Firms can help its workers rise to this level. First, they might create social infrastructures to support mindfulness and ethical development. For example, employees could learn from people the company considers moral exemplars. Anonymous discussion forums could supplement F2F meetings; such conversations can affect ethical growth (Nucci, 2001; Pascarella, and Terenzini, 1991). EI training programs are also available (Stys and Brown, 1994).

Second, DMs need to know how to use ethical concepts. Recall that virtue ethics focuses on the attributes a good person should have. Virtues must be understood in general before being applied to specific situations. If virtues are not discussed until DMs are meeting about a particular situation, the decision process might be lengthy and chaotic. Chun (2005) used content analysis and surveys to identify six virtues for business: integrity, empathy, warmth, courage, conscientiousness, and zeal. Her methods could be replicated to find virtues for individual organizations. The same argument applies for deontological, or duty-based, ethics, and divine command ethics. Agreeing on duties and commands beforehand will make problem solving easier. Of course, as with virtues, simple definitions are not enough. They might be accompanied by stories showing how duties and commands manifest themselves.

To use ethical concepts well, DMs should know about errors they could make. Ethical training should include "moral traps" that show DMs how adding information can change their views about which action is best. Causal attributions may be particularly susceptible to such changes. For example, suppose a pharmacist refused to sell a life-saving drug to someone who could not pay the full price (this is the basis of the well-know Heinz dilemma). Many people would automatically attribute this to the pharmacist's greed, with consequent anger at the pharmacist and conclusions about his or her character. It may be, however, that the pharmacist has already promised the entire drug supply to other patients, including some who cannot pay at all.

Adding this one fact can change a DM's evaluation of the situation. Traps like this should encourage DMs to understand a situation completely before committing to an action.

Training materials might exploit emotional effects. Cases inducing awe and elevation could affect DMs' goals. Cases inducing fear could show DMs how they can be manipulated, preparing them to identify and resist real manipulation attempts. Cultural relativism should be discussed, so DMs can develop informed opinions. DMs should also know how to control their use of racial and other stereotypes and be aware of deindividuation and its effects.

Recall that mindful DMs know about their own idiosyncratic biases, as well as those all humans share. For example, a DM might be emotionally sensitive to discriminatory hiring because of personal experience. The DM should be aware of this and be ready to, for example, recuse him- or herself from such cases.

Third, firms should help DMs work in groups. Showing them how to set positive group norms, build cohesion, resolve conflict, and so on, would help prepare DMs to be better ethical decision makers. They should also learn about the effects of physical attractiveness on decisions.

Fourth, group leaders need special training. It should emphasize transformational leadership, monitoring norms, keeping remote DMs socially connected, and so on.

Fifth, developing ethical climates, encouraging mindfulness, discussing virtues - all of these will generate conflict. Managers should decide whether the gains are worth the costs. Perhaps these efforts are feasible only at high levels in the company, where relatively few people make relatively important decisions.

C. Support Tools

This section suggests tools that prepared DMs could use. Grohowski (1990), Tryan et al (1992), Alavi (1994), Chena, Liou, Wang, Fan and Chi (forthcoming), and others offer guides to

GSS features. Their ideas will not be reproduced in detail here. Only issues peculiar to ethical decisions are considered.

1. Planning and Preparation Tools

Team leaders must put together a group that can be effective (Beranek et al., 2005). This might be difficult. For example, there could be mindful DMs who lack technical knowledge, and technical experts who are poor team members. A solution is to have different roles. Core DMs wrestle with ethical issues and make the final decision, with experts as consultants, contributing as needed. There is a tradeoff, since the consultants may know less about the problem, not follow norms, and be less committed. This is better than having a dysfunctional group, however.

Team leaders should identify roles, suggest positive norms, clarify expectations, and start building a group identity before the project begins. An EDSS could help. It might offer reports on candidate DMs' performance on earlier projects, and the results of personality and moral reasoning level tests. The system could store sample covenants, i.e., behavioral contracts for groups. It could help leaders identify disparities in DM power, using the list of sources of power given earlier. For example, leaders could identify direct and indirect reporting relationships between DMs. The system could suggest that DMs meet for meals and other social rites.

Once the team is assembled, an EDSS could help prepare them to work together. The EDSS could help build activity, availability, process, and social awareness. DMs could supply a personal profile that might include an introductory video, a statement of moral commitments, and perhaps stories illustrating their use. This might help identify moral differences in the team before they harm the decision process. DMs could participate in a mindful discussion of these differences. DMs could also talk about their goals for the project, whether imposed by the company, a supervisor, the DM him- or herself, or some other entity. Leaders should ask powerful DMs to be aware of their special responsibilities.

2. Elaboration Tools

It is important not to make a type III error: solving the wrong problem (Chae, Paradice, Courtney, and Cagle, 2005). Mitroff (1997) lists five causes of type III errors: (1) omitting stakeholders, (2) missing useful actions, (3) phrasing a problem incorrectly (e.g., defining it in just technical or just humanistic terms, rather than both), (4) drawing the problem's scope too narrowly, and (5) looking at part of the problem rather than the whole system. Mitroff (1997) offers solutions, e.g., identify at least two stakeholders who will oppose each action.

An EDSS could remind DMs of these issues, perhaps offering to record their comments about each one. The system might let DMs formulate the problem in more than one way, perhaps reflecting various stakeholders' opinions. DMs or subgroups might create their own formulations, and the group would compare the results. This requires the group to be high in mindfulness, however, so the task does not split the group.

DMs should consider how important the situation is to the stakeholders. Jones' (1991) indicators of moral intensity are useful here. The system could help DMs think about each factor from each stakeholder's perspectives.

3. Structure and Thought Tools

DMs might use different ethical theories simultaneously. For example, a DM might suggest an action that hurts everyone the least (utilitarianism). Another might point out that the action is not just (deontology). A third DM could say that the action would be disloyal (virtue). How could an EDSS represent this diversity in viewpoints?

Figure 2 shows elements common to different theories. First, there are actions. The goal is to select one. Second, there are stakeholders. Third, there are philosophical principles. Each can be a duty (e.g., justice), virtue (e.g., honesty), or divine command (e.g., do not steal). (Heuristics are discussed later.) DMs can combine them in any way. Finally, there is a matrix with actions

on one dimension, and stakeholders and/or philosophical principles on other dimensions. These structures are simply aids to thought, of course. An EDSS should not force DMs to fill every cell. The DMs, not the IS, decide what to work on, how to do it, and when to stop.

This structure decomposes the problem into small parts, reducing the number of issues DMs consider at one time. Each cell contains the DMs' conclusions about the cell's referents. It might be some text or a numeric score. Some cells will be easy to complete. For example, Al-Vac's DMs might all agree they don't have a duty to XamMart. Other cells will need more work. The EDSS should offer tools DMs can attach to each cell as needed. They can be roughly divided into thought tools and interaction tools. The latter are discussed in the next section.

Thought tools help compensate for cognitive and emotional biases. Recall that people make assumptions that may be incorrect. DMs can expose assumptions by restating issues, creating event time lines, and building causal flow diagrams (Jones, 1998). Another approach is Strategic Assumption Surfacing and Testing (Mason and Mitroff, 1981), where DMs debate opposing viewpoints. Again, this should only be done with mindful groups. Testing inferences might involve checking facts (with experts, Web sites, etc.), and using statistical analysis. Contingency tables are also useful. For judgments not amenable to quantification, DMs can at least perform a "sanity check," that is, ask whether the assumption is reasonable *prima facie*. The EDSS could also remind DMs of the project's goals as they work, as well as their own level of moral self-relevance. Recall that priming increases the influence of goals on decision making.

Mindful decision makers can ask what information would show that a given belief is *not* true. Most people are not used to thinking this way. However, finding evidence that should not exist can be a powerful check on unwarranted assumptions.

DMs need to indicate their preferred actions. They should be able to eliminate actions that fail important tests. They should be able to rank actions. The EDSS might allow more than one ranking. For example, AlVac's DMs could present executives with two rankings of actions, one that puts duty before loyalty, and another that puts loyalty before duty. The EDSS could also help DMs create scores for actions. They would be like ranks but would use an interval scale.

The EDSS could help DMs avoid satisficing by flagging actions that have not been fully evaluated. It could also encourage them to generate alternatives before they start evaluating them. This might reduce the chance that DMs will miss a good solution because they have already found and evaluated one that is acceptable.

Recall that DMs can use heuristics to check their decisions. Would they want their actions reported in the press? Can they look at themselves in the mirror? Would they mind switching places with any stakeholder (this is perspective taking, the basis of empathy)? The EDSS could let DMs add heuristics to vector P in Figure 2, if desired.

Recall that emotion can set goals for cognition. A DM might choose an action based on "gut feel," and then justify it by manipulating the analysis. This could be intentional or unconscious (i.e., the DM might not know that he or she is working backwards). Mindful and honest DMs could consciously try to work forward from evidence to conclusion. An EDSS might help by asking them to consider how each piece of evidence supports the decision.

It is unclear whether DMs should work independently on ethical decision subtasks (e.g., completing a cell). If the DMs are mindful, share similar values, define terms in the same way, and trust each other, it might work. However, when there is value diversity, lack of trust, or lack of mindfulness, division into subtasks may not be effective. For example, DMs might not trust each other to do unbiased analyses.

4. Interaction Tools

First, the EDSS could support paralinguistic cues, such as emoticons and hapticons. Some could be standardized. For example, a particular icon could signal that the receiver does not understand the sender's intention. Some icons could map to clauses in the group's covenant.

Second, the EDSS could let DMs move clarification and other peripheral conversations to the side to avoid cluttering the main communication channel. Once the message is clarified, the sender might replace it with one that better reflects his or her intent. There is a risk that the message log will be incorrect in important ways, but the tradeoff may be worthwhile.

Third, the EDSS could help DMs be mindful of messages' emotional effects. For example, the system could look for words in text messages that might evoke negative emotional responses. It could bring them to the sender's attention before the message is sent. It might offer to hold the message for a day, so the sender has time to calm down.

Fourth, the EDSS might help DMs get private advice on what a message means. DMs could send messages to trusted advisors, asking for help interpreting them. The EDSS might strip identifying information from the messages before advisors see them.

Fifth, the system could help DMs help each other. For example, the EDSS could randomly assign a DM to be a devil's advocate, someone who questions others' thinking (Walker, 2004). Perhaps DMs could send each other awards for insightful comments or exemplary mindfulness, like the "good site" awards webmasters sometimes give each other. Awards might help with motivation and group cohesion, although under what circumstances is an empirical question.

Sixth, the EDSS could help DMs keep notes on other DMs' goals, strengths, biases, etc. It could ask DMs to offer evidence for their beliefs. This might help DMs consider whether their conclusions about each other are justified or result from personal dislike, attractiveness, and so

on. Perhaps the EDSS could identify powerful individuals and cliques by looking for deferential messages, consistent voting patterns, changes in patterns of contributions, and other indicators.

Seventh, the EDSS could help with group identity and motivation. It could show the team's name and logo on every screen and document. It could display quotes indicating top management's support for ethics, and perhaps a short video of the CEO. The EDSS could help DMs keep group well-being in mind. It could let them signal leaders and perhaps other DMs when they perceive a threat, before things get out of control.

Eighth, the EDSS could help team leaders improve interaction. For example, it could encourage transformational leadership by suggesting that leaders make notes on whether each DM's achievement and self-actualization needs are being met. The system could generate reports showing task status, where time is being spent, how much DMs are contributing, and so on.

The EDSS should support both F2F and CMC work. Remote communication has a state problem. DMs left off an email list do not have the full message state. Further, DMs in Australia might be sending messages rapidly, changing the message state, while their Canadian counterparts are sleeping. The EDSS can help. First, DMs should send messages to the EDSS, so it can forward them to everyone. The system might tell DMs when there is a new message, but require them to access an EDSS server to read its content. That way, there is only one message repository. Second, the EDSS could help DMs get synchronized to the current message state. For example, the EDSS can highlight messages sent since the last time a DM used the system. This might include messages buried in forum threads, which otherwise might go unnoticed. Finally, the EDSS could use social proxies or other means to reflect DMs' social presence. It could use Webcams to improve social awareness. For example, a DM might have a Webcam focused on a

collection of his or her children's art work. Other DMs might show the weather outside their office windows, a thought for the day, or the current state of their coffee pots.

5. Presentation Tools

Thinking about how to explain something helps clarify one's own thoughts. Further, people work harder when they know others will see the results. An EDSS could help by generating slide shows or reports from DMs' analyses. DMs could select which parts of their work would be included, could annotate their analyses for presentation, and choose presentation styles.

6. Metaprocesses

Metaprocesses help people examine decision methods. Issues include things like agenda setting, anonymous voting, and conflict management. Separating metaprocess and problem discussions will help DMs focus attention appropriately. Metaprocess discussion may be heaviest early in a project, particularly when DMs have not worked with each other before. The contents of metaprocess agreements could be captured in behavioral covenants and other documents.

Ideally, DMs would feel able to raise process issues without penalty. For example, a DM could ask for an anonymous vote on an issue without being accused of not trusting others. All DMs should recognize that organizational power is complex, and that its perceived use is not always intended. Asking for anonymity is not necessarily a slight against anyone.

7. Accumulating and Reusing Analyses

Ethical issues recur across time and across companies (Kidder, 1996), so it is possible that existing analyses could be reused. DMs should ensure that an existing analysis applies to the current case. Priming could be a problem, especially since ethical situations are often ambiguous. Suppose a DM who has not studied the current situation reads an existing analysis. It could influence the way he or she interprets the current problem, and important issues might be overlooked. DMs should study the present situation first, before looking at past analyses. The

firm could also reuse effective decision processes. It might create agenda templates, identify tools past teams have used effectively, and list issues that may cause problems.

8. Accumulating Wisdom

DMs may learn things that generalize beyond one decision project. They might be lessons about breaking emotional deadlocks, reconciling goal conflict, or the effects of treating people badly. The lessons might be called "wisdom." In fact, accumulating wisdom might be the most important outcome of ethical decision making. The EDSS might ask DMs to articulate things they have learned and make the results available to others in the company.

9. Security, Privacy, and Plausible Deniability

Naturally, an EDSS should be secure. Only authorized people should have access. Privacy questions are trickier. For example, should a DM's supervisor have access to all EDSS records? Writing such policies is part of the company's preparation for EDSS use.

An important question is whether people outside the firm should have access to EDSS records. One answer is "yes." If firms can hide information, they can plausibly deny knowing about their actions' negative effects. On the other hand, records of ethical discussions, particularly where one right is traded for another, are certain to provoke some people. The resulting furor would punish firms that are trying to face their responsibilities. Further, some people will argue that an action is unethical because they seek political gain, publicity, or cash from a legal settlement.

Protecting EDSS records may help the devious justify unethical acts. However, not doing so may push ethical decisions into the shadows. Choices will still be made, but will be subject to emotional conflicts, abuses of power, and so on. This will only benefit the unscrupulous.

V. CONCLUSION

The question "What's right?" is both difficult and commonplace. Centuries of debate have not yielded clear answers, yet we face the question every day. Perhaps computers can help. They cannot tell us what is right, but they can help us think about it.

As we study EDSS, conflicts between researchers will occur. For example, systems built by justice-oriented designers might seem inadequate to those with a care approach. These differences are opportunities to learn. Whether that happens depends on the researchers' mindfulness.

Would firms use EDSS? One view is that an EDSS might create schisms dividing a company. On the other hand, an EDSS could promote an ethical culture, help firms avoid blunders, and promote the personal growth central to new company forms (e.g., Senge, 1990).

Ethical manipulation is a recurring theme in this paper. Ethical arguments are used to justify immoral acts. For example, the Nazis in 1930s Germany justified killing the handicapped on ethical grounds (Mostert, 2002). People can sometimes detect lies and manipulation (Maoz, 1990), though not always (Ekman and O'Sullivan, 1991). These issues require more study.

What is the next step in EDSS research? Building EDSS would be easier if we knew how people make ethical decisions. Current theories of ethical behavior (see Banerjee et al., 1998, for a brief review) describe general effects, but we need to study detailed individual thought and group interaction. Design science can help. As Hevner et al. (2004) notes, design science lets us study both the artifacts we create, and the processes they support.

This paper also raises questions amenable to experimental study. For example, does mindfulness affect GSS use? What happens when DMs give each other awards? Along with such empirical work, researchers should also think about the complex philosophical and theoretical issues underlying ethical decision support.

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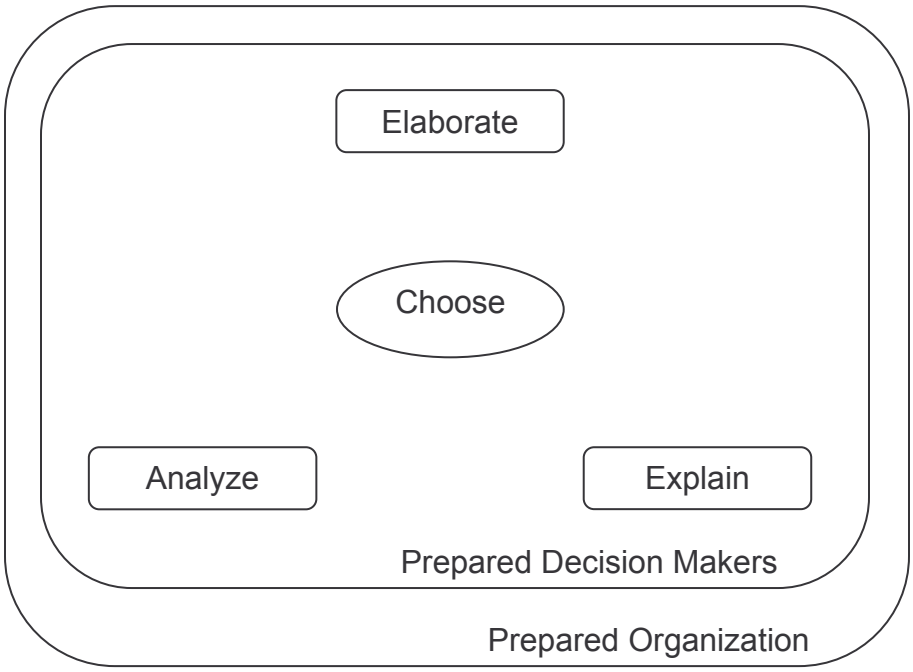

Figure 1. Structure and Context of Ethical Decision Support

A : actions

action 1	action 2	…	action k

S : stakeholders

stakeholder 1	stakeholder 2	…	stakeholder m

P : principles - duties, virtues, divine commands, evaluation heuristics

principle 1	principle 2	…	principle q

L : lattice - A x S (utilitarian), A x P (duties, virtues, divine commands, evaluation heuristics, mixed), A x S x P or A x P x S (complete)

Example	action 1	…	action k
principle 1	a_1 p_1	a… p_1	a_k p_1
…	a_1 p…	a… p…	a_k p…
principle q	a_1 p_q	a… p_q	a_k p_q

Figure 2. Operationalizing Ethical Analysis