December 2007

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ABSTRACT

Information technology is a vital aspect of society and commerce today, and will continue to be so in the foreseeable future. Much of the concentration of systems development work has been concerned with technical issues and on extracting the required elements of a system needed to produce desired results. It is crucial that in addition to the technical and requirements aspect of the system, the systems development professional look at what the impact to society might be of what the finished system does, how it accomplishes its processes and what it produces. Development professionals need to be aware of when an ethical gap occurs between what the system will do and what it should from an ethical perspective. This requires the systems development professional become aware that ethical issues exist, to assess the ethical issues surrounding the system they are developing, and to develop an ethically acceptable solution. In this paper I will suggest a procedure for addressing the ethical gap.

KEYWORDS

Ethics, Ethical Analysis, Information Systems Development, Systems Development, Systems Developer

INTRODUCTION

Information technology is a vital aspect of society and commerce today, and will continue to be so in the foreseeable future. Much of the concentration of systems development work has been concerned with technical issues and on extracting the required elements of a system needed to produce the desired results. However, there is more at stake than just ensuring the system does the right things and produces the right results. Vital to every information system is the information systems development professional who develops the system with the goal of providing a system that functions properly and meets the needs of those who will use it. It is crucial that in addition to the technical and requirements aspect of the system, the systems development professional look at what the impact to society might be of what the finished system does, how it accomplishes its processes, and what it produces. Development professionals need to be aware of when an ethical gap between what the system will do and what it should from an ethical perspective occurs. This requires the systems development professional to become aware that ethical

issues exist, to assess the ethical issues surrounding the system they are developing, and to develop an ethically acceptable solution. In this paper I will suggest a procedure for addressing the ethical gap.

FOUNDATIONAL ISSUES
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Ethics

The Merriam-Webster Online dictionary defines ethics as:

the discipline dealing with what is good and bad and with moral duty and obligation
a: a set of moral principles or values; b: a theory or system of moral values; c: the principles of conduct governing an individual or a group; d: a guiding philosophy (ethic)

In reviewing the definition of ethics the word moral appears several times and is a key concept of ethics. Moral is defined as:

a: of or relating to principles of right and wrong in behavior; b: expressing or teaching a conception of right behavior; c: conforming to a standard of right behavior; d: sanctioned by or operative on one's conscience or ethical judgment; e: capable of right and wrong action (moral)

The definition of moral focuses on behavior and particularly on "right" behavior. One can interpret from this that a moral person or a person acting morally will be a person that does the right things or, at least in a particular situation, is doing the right thing. Note that this does not mean right in the sense of getting a correct answer on a test. It means right in terms of its effects on society, another person, or an organization.

Unfortunately goodness or badness, rightness or wrongness, are not finite, one-definition-fits-all concepts. They have different meanings to different people and/or segments of society. Likewise, not everybody conforms to the same codes of conduct or beliefs—often times two people intending to do good, will hold totally opposite beliefs of what is good in a given situation.

Ethical Theories

There are many ethical theories one can use to evaluate a situation for its ethical implications. While it is beyond the scope of this article to explain each theory, a few will be mentioned as examples. Smith and Hasnas (1999) recommend three theories that can be used in the Information Systems context. In their article, they discuss stockholder theory, stakeholder theory, and social contract theory. Additionally, Laudon and Laudon (2006 p. 154) identify several other theories such as the Golden Rule, Immanuel Kant's Categorical Imperative, Descartes' rule of change, the Utilitarian Principle, the Risk Aversion Principle, and the ethical "no free lunch" rule. In addition to these theories, many professions have developed codes of conduct which imbed a particular ethical view agreed upon by the profession. Which theory or theories the Information Systems professional uses is a matter of personal choice coupled with the ethical position taken by their profession and organization. The point is not which theory is the best; the point is for the Information Systems professional to know which best fits with their beliefs and to use this choice as their standard of ethics as they become aware of the ethical issues surrounding their work.

Ethical Dimensions of Information Systems

Mason (1986) identified four aspects relating to Information Systems which should be looked upon ethically. These four aspects are privacy, accuracy, property, and accessibility. Laudon and Laudon (2006 p. 150) identify what they call the "five moral dimensions of the information age." These five dimensions are information rights and obligations, property rights and obligations, accountability and control, system quality, and quality of life. As Information Systems professionals go about their work, they must be aware of how what they are doing ethically impacts the above dimensions.

Technology

For information systems professionals, technology is an enabling factor in being able to provide state of the art Information Systems to users. By using technology, developers construct computer systems that meet the many needs users have in trying to accomplish their functional responsibilities within an organization. To the developer, the use of technology provides benefits to people and organizations. Such benefits might include the ability to better serve customer needs, a cleaner and safer work environment, enhanced skills on the part of the user, less negative environmental impact, improved quality of life, medical breakthroughs, and so forth. However, not all persons view technology in the same way as systems developers.

Barbour (1993) categorizes technology into three areas: "Technology as Liberator," "Technology as Threat," and "Technology as Instrument of Power." As a liberator, technology is seen to provide benefits to society and components of society. As a threat, technology leads to uniformity in a mass society, loss of individuality, loss of feeling for employees by organizations, loss of worker power, and alienation of the worker. As an instrument of power, technology is seen as a threat because those who develop and produce technology do it for profits, for special interest groups, and for government. The developers and suppliers of technology are seen by some not as providing and developing technology with the good of society as their goal, but only for their own well-being.

Information

"Information is the symbolic means by which one mind influences another mind. According to Davis and Olson (1985), 'Information is data that has been processed into a form that is meaningful to the recipient [the information taker] and is of real or perceived value in current or prospective actions or decisions.'" (Mason, Mason, & Culnan 1995) Information, which is the ultimate output of an information system, is much different than other resources used within organizations. Being intangible, information cannot be touched, weighed, or measured in the physical sense. The same information can be worthless to some while extremely valuable to others. It can give one a tremendous advantage or be extremely damaging to another. In some cases it must be protected from dissemination at all costs, while in other cases it is given away freely.

Essentially, information is very flexible, can be very hard to control and protect, can become overwhelming and is critical to decision makers who rely on it. Ethical issues involving information are abundant and often directly opposed.

Participants

Mason, Mason, and Culan (1995 pp. 32–33) identify four categories of participants who take part in the information chain: information givers, orchestrators, information takers, and stakeholders. Information givers are those who provide the raw data for the information mechanism. Orchestrators are those who receive the information from the givers, combine it with other relevant information, validate it, store it, protect it, and finally deliver it to the information takers. Information takers are those who receive the information and utilize it for decision-making. Stakeholders are those who are affected by the actions of the givers, takers, and orchestrators. Essentially, Information Systems professionals play a significant

role in the orchestration process in organizations today. As such, they are responsible for ethically dealing with their responsibilities for the information.

BRIDGING THE GAP

Now that the foundational issues concerning ethics and different issues surrounding ethics and information systems have been discussed, it is now time to discuss what to do. First discussed will be the ethics gap and then discussed will be steps to take to resolve the gap.

Ethics Gap

In given situations, one may find that there is a difference between what they believe to be the good and right thing to do, which would be based on their standard of ethics, and what they are being asked or directed to do. When this situation occurs where the party asking or directing a person to act holds influence over our success or survival, the person has what Navran (1992) calls an "ethics gap." Essentially the ethics gap occurs when one is given an assignment or directive that, after he or she has done an ethics evaluation, the person feels is the wrong thing to do and bad consequences will result if the directive is carried out. As an example, a development project leader may be instructed by management to implement a new system on a given date, without fail. The project leader, having evaluated the situation, knows that if the system is implemented on that date, it will not have been fully tested and may result in serious errors that will have negative affects on the client and will negatively affect the reputation of the development firm and the project manager. Here, there is a definite gap between what the project manager is being told to do, implement the system, and what the project manager feels is the right thing to do, delay the implementation. At this point, the project manager has to make the decision to either implement the system and hope for the best, or try to convince management that ethically, implementing is the wrong thing to do.

Navran proposes that we try to bridge the ethics gap and offers a seven step process to do so. These seven steps are listed in Table 1. Additionally, other authors have provided procedures that can be followed to analyze an ethical dilemma.   In Table 1, procedures from three additional sources, Mason (1995), Reynolds (2007) and, Laudon and Laudon (2006), are listed,. While each procedure provides a good general set of steps, this author feels that a combination of these procedures would be more useful. Even though they appear to be somewhat similar, each offers unique aspects that add to the effectiveness of a combined procedure.

Navran	Mason	Reynolds	Laudon & Laudon
• The individual has to be aware of the ethics gap • Accepting the responsibility • Having admitted that there is an ethics gap and accepting the responsibility to bridge it, the individual must	• What are the facts? • What Ethical Principles, Standards, or Norms Should Be Applied? • Who Should Decide? • Who Should Benefit From the Decision? How Should the Decision Be Made?	• Get the facts • Identify the stakeholders and their positions • Consider the consequences of your decisions • Weigh various guidelines and principles • Develop and	• Identify and describe clearly the facts • Define the conflict or dilemma and identify the higher-order values involved • Identify stakeholders • Identify the options

define it • Having defined the problem, the individual must develop ethically congruent alternatives • Develop a values based argument in support of the most effective and pragmatic alternatives • Join your power with others • Escalate	• What Steps Should Be Taken to Prevent This Issue From Occurring Again?	evaluate options • Review your decision • Evaluate the results of your decision	you can reasonably take • Identify the potential consequences of your options

Table 1. Alternative Procedures for Ethical Analysis

This author suggests a combined procedure be developed within the context of Simon's four stages of decision-making. His four stages include intelligence, design, choice, and implementation (Laudon & Laudon 2006 pp. 462–463). Intelligence focuses on problem discovery and definition, design focuses on identifying and exploring potential solutions, choice focuses on selecting an alternative, and implementation focuses on putting the proposed solution in place. The suggested procedure is as follows:

- Intelligence
  - Scan for ethical gaps
  - Become aware of the gap
  - Accept the responsibility for doing something about the gap
  - Define the ethical issue
    - Define the conflict or dilemma
    - Identify the higher-order values involved
    - Identify stakeholders and their positions
    - Identify the consequences of the ethical issue
  - Identify the ethical principles, standards, or norms that should be applied
  - Weigh various guidelines and principles
  - Determine who should benefit from the decision
  - Determine who should decide
  - Determine how the decision should be made
- Design
  - Develop ethically congruent alternatives
  - Identify the options you can reasonably take
  - Evaluate options against ethical principles, standards, norms, guidelines, and principles identified for this issue
  - Evaluate affect of each option on stakeholders
  - Identify potential consequences of each option
  - Develop a values-based argument for each reasonable alternative
- Choice
  - Evaluate values-based arguments for each alternative
  - Select the most reasonable solution
  - Join power with others if additional support is needed

- o   Escalate to higher authority if necessary
- Implementation
  - o   Implement the solution
  - o   Review the implemented decision
  - o   Evaluate the results of the implemented decision
  - o   Determine what steps should be taken to prevent issue from occurring again

Using the above procedure as a tool, the Information Systems professional can systematically evaluate an ethical issue and increase the likelihood of being able to develop an ethically acceptable solution that is also an acceptable solution to the information systems problem at hand.

CONCLUSION

Acting ethically and looking at situations from an ethical viewpoint is a very complicated and often uncomfortable task. It forces systems professionals to take a look away from the technical and requirements aspects of development and look at the people aspects—something that does not come naturally for many technically-oriented developers; but, it is imperative that Information Systems professionals do so.

The ability to amass, disseminate, and steal information is becoming increasingly easy with today's technological advances. Information in today's public and private databases often reflect the personal lives of people in society and, as such, reflects in many senses their personalities, behaviors, secrets, and desires. These must be protected. The best way to successfully protect personal lives is to look at the work being done and the requests being made with an ethical eye. It is highly likely that omissions of ethical aspects of a system may well be more damaging than omissions of technical or requirements aspects.

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