CHAPTER 

Introduction: Why Computer Ethics?

SCENARIO 1.1 Should I copy proprietary software?

Since John graduated from college, five years ago, he has been investing small amounts of money in the stock market. A year ago, he discovered an extremely useful software package that helps individual investors choose penny stocks. (Penny stocks are stocks of small companies that sell for a few dollars or less per share.) The software requires users to input information about their attitudes toward risk as well as the names of penny stock companies in which they are interested. The software provides a wide range of information and allows the user to analyze stocks in many different ways. It also recommends strategies given the user's attitudes toward risk, age, size of investment, and so on.

John has several friends who invest in stocks, and one of his friends, Mary, has been getting more and more interested in penny stocks. At a party, they begin talking about investing in penny stocks and John tells Mary about the software package he uses. Mary asks if she can borrow the package to see what it is like.

John gives his disks and documentation to Mary. Mary finds the software extremely useful. She copies the software and documentation onto her computer. Then she gives the package back to John.

John and Mary were both vaguely aware that software is proprietary, but neither read the licensing agreement very carefully. Did John do anything wrong? If so, what? Why is it wrong? Did Mary do anything wrong? If so, what? Why is it wrong?

SCENARIO 1.2 Should my company make use of data mining technology?

Inga has worked hard all her life. Ten years ago, she started her own business selling computer software and hardware. In any given year now, 100,000 to 200,000 customers purchase things in her store. These purchases range from a $5 item to a $10,000 item. As part of doing business, the company gathers

ISBN: 0-558-13856-X

information on customers. Sometimes information is gathered intentionally (e.g., when they distribute customer surveys to evaluate the service they are providing and find out their customer preferences). Other times, they gather information embedded in the purchase transaction (e.g., when they record name, address, what is purchased, date purchased).

Recently Inga has been reading about data mining tools. Data mining tools allow the user to input large quantities of information about individuals and then search for correlations and patterns. Inga realizes that she might be able to derive useful information about her customers. The records contain credit card numbers, checking account numbers, driver's license numbers, and so on, but to make use of this information, it would have to be "mined." The zip code alone is extremely valuable in that data mining tools might reveal a correlation between purchasing habits and zip code, and would allow Inga to target advertising more effectively. The correlation between zip codes and purchasing pattern might then be correlated with public records on voting patterns to identify what political sympathies customers in various zip codes have and to see how political affiliation is correlated with size of purchase. This could also be useful in targeting advertising.

Inga is conflicted about using data mining tools. On the one hand, her customers have given information in order to make a purchase and data mining would be using this information in a way that the customers had not anticipated. On the other hand, for the most part, the information would not identify individuals but rather groups of individuals with financial or attitudinal patterns.

Should Inga use data mining tools?

SCENARIO 1.3 Freedom of expression.

In December 1994, Jake Baker, a sophomore at the University of Michigan, posted three sexual fantasies on an Internet newsgroup "alt.sex.stories." The newsgroup was an electronic bulletin board whose contents were publicly available through the Internet. In one of these stories entitled "Pamela's Ordeal," Baker gave his fictional victim the name of a real student in one of his classes. The story describes graphically the torture, rape, and murder of Pamela, and ends with the woman being doused in gasoline and set afire while tied to a chair. In addition to publishing the fantasies on the newsgroup, Baker also exchanged e-mails with another man from Ontario, Arthur Gonda, discussing the sexual acts. In one of these e-mails, Baker said that "[j]ust thinking about it anymore doesn't do the trick . . . I need *to do it*." It should be noted that Gonda's true identity and whereabouts are unknown. The e-mails were private, and not available in any publicly accessible portion of the Internet.

A University of Michigan alumnus in Moscow spotted Baker's stories while browsing the newsgroup and alerted university officials. The campus police and the Federal Bureau of Investigation were then brought in to investigate the

ISBN: 0-558-13856-X

case. On February 9, 1995, Baker was arrested and was held in custody for 29 days. A month later, he was charged in a superceding indictment with five counts of transmitting interstate communication of a threat to injure another. The story on which the initial complaint was partially based, however, was not mentioned in the superceding indictment, which referred only to the e-mail exchanges between Gonda and Baker. The charges were dropped in June 1995, on grounds that Baker expressed no true threat of carrying out the acts.

Did Jake Baker do anything wrong? Should the police have arrested him?

This case was written by Marc Quek Pang based on the following sources: *United States v. Baker,* Criminal No. 95-80106, United States District Court for the Eastern District of Michigan, Southern Division, 890 F.Supp. 1375; U.S. Dist. (1995) (LEXIS 8977); 23 Media L. Rep. 2025 (June 21, 1995) decided (June 21, 1995) filed; Philip Elmer-Dewitt, "Snuff Porn on the Net," *Time Magazine,* February 20, 1995, p. 69; Peter H. Lewis, "An Internet Author of Sexually Violent Fiction Faces Charges," *New York Times,* (February 11, 1995), p. 7; other sources include local Michigan newspaper articles.

SCENARIO 1.4 What is my professional responsibility?

Milo Stein supervises new projects for a large software development firm. One of the teams he manages has been working on a new computer game for children in the 8 to 14 age group. It is an educational game that involves working through a maze of challenges and solving inferential reasoning problems. Players of the game get to choose which character they want to be and other characters appear throughout the game. The characters are primarily exaggerated macho guys and sexy women.

While Milo is attending a conference of computer professionals, he decides to attend a session focused on gender and minorities in computing. He listens to several papers focused on various aspects of this matter. One paper discusses the bias in software, especially in the design of children's software. Apparently, when software designers are asked to design games for children, they design games for boys (Huff and Cooper, 1987). The games are not, then, comfortable to female users. Milo also hears another paper about the small number of women and minorities who are majoring in computing in college despite there being a national crisis due to the shortage of technically trained people. The session ends with a panel discussion about what computer professionals can do to make computing more attractive to women and minorities.

When Milo returns to work after the conference, the leader of the team working on the new computer game reports that the game is ready for final testing before being released for marketing. Milo has never thought much about the composition of the team before, but he now realizes that the team consists only of men. Milo wonders if he should ask the team to rethink the game and have it reviewed for gender and/or racial bias. What should he do? Even if the game sells well, should a different message be sent with the game? What is his responsibility in this regard?

ISBN: 0-558-13856-X

These scenarios pose a variety of types of ethical questions. The first raises a question for personal decision making and is inextricably tied to the law. Is it morally permissible for an individual to break the law by making a copy of proprietary software? If so, when is law breaking justified? When it's a bad law? When the law is easy to break? The second scenario also raises a question for individual decision making, but here the decision has to do with establishing a policy for a company. Inga has to decide what her company should do and this means taking into account what is good for the company—its bottom line, its employees, as well as what her responsibilities are to her customers. The third scenario poses an issue that could be addressed either as an individual matter (should I censor myself when I do things on the Internet) or as a public policy matter (should there be free expression online?). Finally, the fourth scenario raises a question of professional ethics. What Milo should do in the situation described is not just a matter of his individual values but has much to do with the profession of computing. That is, computer professionals have a collective responsibility to ensure that computing serves humanity well. Moreover, Milo's behavior will impact the reputation of computer professionals as well as his own and his employer's.

Taken together, the four scenarios illustrate the diverse character of ethical issues surrounding computer and information technology. Among other things, the ethical issues involve property rights, privacy, free speech, and professional ethics. The development and continuing evolution of computer and information technology has led to an endless sequence of ethical questions: Is personal privacy being eroded by the use of computer and information technology? Should computers be used to do anything they can? What aspects of information technology should be owned? Who is morally responsible for errors in software, especially those that have catastrophic effects? Will encryption technology make it impossible to detect criminal behavior? Will virtual reality technology lead to a populace addicted to fantasy worlds? These questions ultimately lead to deeper moral questions about what is good for human beings, what makes an action right and wrong, what is a just distribution of benefits and burdens, and so on.

While the scenarios at the beginning of the chapter illustrate the diversity of ethical issues surrounding computer and information technology, it should be noted that there is still a puzzle about why computer and information technology give rise to ethical questions. What is it about computer and information technology, and not bicycles, toasters, and light bulbs, that creates ethical issues and uncertainty about right and wrong, good and bad? This question and a set of related questions are contentious among computer ethicists. The controversy has focused especially on whether the ethical issues surrounding computer and information technology are unique. Are the issues so different from other ethical issues that they require a "new ethics," or are the ethical issues associated with computer and information technology simply old ethical issues in a new guise?

ISBN: 0-558-13856-X

The uniqueness issue is intertwined with several other important and persistent questions. Why or how does computer and information technology give rise to ethical issues? Is a new field of study and/or separate academic courses needed to address the ethical issues surrounding computer and information technology? What does one "do" when one does computer ethics? That is, is there a special methodology required? The uniqueness issue seems to be at the core of all of these questions. Identification of something unique about computer technology holds the promise of explaining why computer technology, unlike other technologies, gives rise to ethical issues and why a special field of study and/or a special methodology may be needed. Of course, if computer and information technology is *not* unique, these issues will have to be resolved in some other way. I begin with the question why computer and information technology gives rise to ethical issues and proceed from there to a more detailed account of the uniqueness issue.

NEW POSSIBILITIES AND A VACUUM OF POLICIES

Computer and information technology is not the first (nor will it be the last) technology to raise moral concerns. Think of nuclear power and the atom bomb. New technologies seem to pose ethical issues when they create new possibilities for human action, both individual action and collective or institutional action. Should I donate my organs for transplantation? Should employers be allowed to use urine or blood tests to determine if employees are using drugs? Should we build intelligent highways that record automobile license plates and document when cars enter and leave the highway and how fast they go?

As these questions suggest, the new possibilities created by technology are not always good. Often they have a mixed value. New technologies bring benefits as well as new problems, as in the case of nuclear power and nuclear waste, automobiles and air pollution, aerosol cans and global warming.

Because new technological possibilities are not always good or purely good, they need to be evaluated—morally as well as in other ways (e.g., economically, environmentally). Evaluation can and should take place at each stage of a technology's development, and can and should result in shaping the technology so that its potential for good is better realized and negative effects are eliminated or minimized. Technical possibilities are sometimes rejected after evaluation, as in the case of biological weapons, nuclear power (no new nuclear power plant has been built in the United States for several decades), and various chemicals that deplete the amount of ozone in the atmosphere or cause other environmental problems.

So it is with computer and information technology. Enormous possibilities for individual and institutional behavior have been created. We could not have reached the moon without computers, nor could we have the kind of global

ISBN: 0-558-13856-X

communication systems we now have. Information technology used in medicine has enormously enhanced our ability to detect, diagnose, and treat illness. Information technology has created thriving new industries and facilitated a growing global economy. Nevertheless, computer and information technology creates potentially detrimental as well as beneficial possibilities. We now have a greater capacity to track and monitor individuals without their knowledge, to develop more heinous weapon systems, and to eliminate the need for human contact in many activities. The possibilities created by computer and information technology, like other technologies, need to be evaluated—morally and in other ways.

Extending the idea that computer and information technology creates new possibilities, James Moor (1985) has suggested that we think of the ethical questions surrounding computer and information technology as policy vacuums. Computer and information technology creates innumerable opportunities. This means that we are confronted with choices about whether and how to pursue these opportunities, and we find a vacuum of policies on how to make these choices. The central task of computer ethics, Moor argues, is to determine what we should do and what our policies should be. This includes consideration of both personal and social policies.

The sense in which there is a vacuum of policies surrounding computer and information technology can be illustrated, first, with examples from the early days of the technology. Consider the lack of rules regarding access to electronically stored data when computers were first developed. Initially there were no formal policies or laws prohibiting access to information stored on a mainframe computer. From our perspective today, it may seem obvious that computer files should be treated as private; however, since most early computing took place in business, government, and educational institutions, the privacy of files was not so obvious. That is, most paper files in these institutions were not considered the personal property of individual employees. Or, consider the lack of policies about the ownership of software when the first software was being written. It wasn't clear whether software should be considered private property at all. It was understood simply to be instructions for a machine.

Since the early days, computer technology has been far from stagnant, and with each new innovation or application, new policy vacuums have been created. Is it ethical for a company with a Web site to place a cookie on the hard drive of those who visit their site?[1] Is data mining morally acceptable? Are Internet domain names being distributed in a fair way? Should surgery be performed remotely with medical imaging technology? Who should be liable for inaccurate or slanderous information that appears on electronic bulletin boards? Should computer graphical recreations of incidents, such as automobile accidents, be allowed to be used in courtrooms? Is it right for an individual

[1] A cookie is a mechanism that allows a Web site to record your comings and goings, usually without your knowledge or consent. See www.epic.org/privacy/internet/cookies/ and www.cookiecentral.com.

ISBN: 0-558-13856-X

to electronically reproduce and alter an artistic image that was originally created by someone else? New innovations, and the ethical questions surrounding them, continue to arise at an awe-inspiring pace. Policy vacuums continue to arise and are not always easy to fill.

FILLING THE VACUUM, CLARIFYING CONCEPTUAL MUDDLES

The fact that computer and information technology creates policy vacuums may make the task of computer ethics seem, at first glance, easy. All we have to do is develop and promulgate policies—fill the vacuums. If only it were so simple!

When it comes to figuring out what the policies should be, we find ourselves confronted with complex issues. We find conceptual muddles that make it difficult to figure out which way to go. And, as we begin to sort out the conceptual muddles, often we find a moral landscape that is fluid and sometimes politically controversial. Consider the case of free speech and the Internet. On the one hand, it takes some conceptual work to understand what the Internet is and it takes even more conceptual work to figure out whether it is an appropriate domain for free or controlled expression. Even if information on the Internet is recognized as a form of speech (expression), we are thrust into a complex legal and political environment in which speech is protected by the first amendment but a variety of exceptions are made depending on content, when and where the words are expressed, and so on. So, figuring out what norms or laws apply or should apply is not a simple matter. Can we distinguish different types of expression and protect them in different ways? Can we protect children while not diminishing adult expression and access?

The Traditionalist Account

How policy vacuums are filled is, in part at least, a matter of methodology. How can or should computer-ethical issues be resolved? On one account—call this the *traditionalist account*—all that is necessary is to take traditional moral norms and the principles on which they are based, and apply them to the new situations created by computer and information technology. For example, when it came to filling the policy vacuum with regard to ownership of computer software, lawyers and judges extended existent property law—copyright, patent, and trade secrecy—to the new "thing," computer software (more on this in Chapter 6). To use a more current example, when it comes to online communication, the traditionalist account suggests that we should look at the conventions that are already followed in face-to-face, telephone, and written communication, and "map" these conventions onto computer-mediated communication. Certain words and questions are considered impolite; certain kinds of conversations are considered confidential; and so on. According to the traditionalist account, we

ISBN: 0-558-13856-X

should take these conventions from precomputer communication and create similar, parallel conventions regarding computer-mediated communication.

The traditionalist account is important both as a descriptive and as a normative account. That is, it describes both how policy vacuums are often filled and recommends how policy vacuums ought to be filled. Descriptively the account captures what people often do when they are first introduced to computer and information technology. For example, when individuals first begin using e-mail, they probably imagine themselves writing letters or talking on the phone. Hence, they identify themselves when they make contact, without considering the possibilities of being anonymous or pseudononymous. The new communication device is treated as prior communication devices were treated, with norms being carried over from the old to the new. When you hear of someone accessing your computer files, you may think of the parallel with someone breaking into your house or office, and it seems clear that they have violated your property rights. So, the traditionalist account captures the idea that when we develop policies with regard to computer and information technology, we tend to draw on familiar social and moral norms, extending them to fit the new situation.

The traditionalist account is also normative in that it recommends how we should proceed in filling policy vacuums. It recommends that we make use of past experience. For example, we already know a good deal about property and the sorts of situations that are likely to arise when property claims come into conflict. Similarly, when it comes to communication, we already know that words can be harmful and can offend, and we know that individuals have an interest in some conversations being confidential. It makes good sense to draw on these experiences when it comes to a new situation, whether it is one created by computer and information technology or something else. So, the normative thrust of the traditionalist account seems important and valuable. We should take norms and principles from precomputer situations and see how they extend to the circumstances of a computerized environment.

Nevertheless, the traditionalist account has two serious problems. As a descriptive account of how the ethical issues associated with computer and information technology are addressed and resolved, it oversimplifies. And, as a normative account of how we should resolve these ethical issues, it has serious dangers. The traditionalist account over-simplifies the task of computer ethics insofar as it suggests that extending old norms to new situations is a somewhat mechanical or routine process. This hides the fact that the process is fluid and synthetic. When it comes to resolving the ethical issues surrounding computer and information technology, often the technology is not a fixed and determinate entity. That is, the technology is itself still "in the making" so to speak. So in trying to resolve an ethical issue arising from the use of computer and information technology, the first step is to clear up the conceptual muddles and uncertainties that are found. These conceptual muddles have to do with understanding what the technology is or should be and what sort of situations it creates.

ISBN: 0-558-13856-X

I mentioned earlier the uncertainty surrounding how to think about the Internet as a forum for communication. This is a good example of the fluidity and uncertainty of technology. If we don't know what the Internet is exactly, we can't know which rules or principles should be applied.

Another example is computer software. A complex body of law regarding ownership of new inventions existed long before the invention of computers, including patent law, copyright, and trade secrecy. Applying this law to computer software, however, was enormously difficult because nothing with all the characteristics of software programs had existed before; so it was unclear how software programs should be conceptualized or categorized. Is a program the kind of thing that should be treated as property? Is a program the expression of an idea? If so, is it a form of intellectual property for which copyright law is appropriate? Or, is it (should it be seen as) a process for changing the internal structure of a computer? Or perhaps a program should be seen as a series of "mental steps," capable, in principle, of being thought through by a human, and not, thereby, appropriate for ownership. Before existent law or norms could be applied, a concept had to be fixed.

This is not to say that traditional legal or moral norms were irrelevant to the policy vacuum surrounding computer programs. On the contrary, there was a need to clear up the conceptual muddle so that the new entity could be seen in relation to familiar legal and moral norms. It is important to keep in mind that deciding whether computer programs are expressions of ideas or mental steps or design specifications for machines is not an issue with a predetermined right answer. Lawyers, judges, and policy makers had to decide what computer programs should be treated as, and in doing this, they, in a sense, *made* computer software what it is. Deciding that copyright law applied to software defined what software is. Later deciding that patent law applied to certain types of software also defined it. In Chapter 6, we will see that various aspects of new software creations persist in challenging traditional property norms. Filling policy vacuums is not a simple process of applying known laws and principles to entities that can be subsumed under them. A good deal of negotiation is required to get the technology and the law or principle to fit.

Our understanding of the Internet also illustrates the fluid rather than mechanical way that traditional norms and laws are extended to computer and information technology. Writers have had a good deal of fun trying to conceptualize the Internet. Some have conceptualized it as a network of highways, the superhighways of the future. Others have thought of it as a huge shopping mall with an almost infinite number of possible stores, and you navigate your way through the mall, perhaps discovering some places you do not want to go. Yet others have likened the Internet to Disneyland, suggesting that what you find on the Internet should always be treated as a fantasy world. These metaphorical renderings of the Internet are attempts to conceptualize the Internet in a way that will help us fill policy vacuums. Another good illustration of this fluid

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conceptual activity is the process of trying to understand the act of placing a cookie on the computer of a visitor to a Web site. Is it intrusive surveillance or business as usual? Are cookies comparable to a store asking for your zip code when you buy something, so that it can do marketing analysis and determine in what neighborhoods to advertise? Or is it more like installing a camera in a store to watch and see every customer that enters? Or is going from one Web site to the next more like traveling on a highway in which case cookies seem more like a surveillance technology. Or, since you may be sitting at home when you navigate on the Web, are cookies comparable to cameras in your home watching what you are reading? Needless to say, how we understand the activity makes all the difference in our evaluation of it and in determining what policies seem appropriate. Deciding how to conceptualize the activity and deciding which norms apply go hand in hand.

The traditionalist account is correct insofar as it suggests that in resolving the ethical issues surrounding computer and information technology, we often try to extend norms and principles from familiar situations to new situations. The account goes wrong, however, when it suggests that this process is simple, routine, or mechanical.

A second problem with the traditionalist account arises from its *recommendation* that we resolve the ethical issues involving computer and information technology by extending norms and laws from situations in which there is no technology or old technology. As already suggested, this is a worthy recommendation insofar as it recommends drawing on experience. The norms that are followed in many prevailing practices have survived the test of time. They often embody important social values such as respect for persons, fairness, and so on. Nevertheless, the recommendation has a danger that should be kept in mind. New technologies, as already mentioned, create *new* opportunities. If we simply extend old norms to new situations, we run the risk of missing the new opportunities. In other words, if we treat new situations as if they are comparable to known and familiar situations, we may fail to take advantage of the novel features of the new technology. To fill policy vacuums created by computer and information technology with traditional norms may prevent the creation of new ways of doing things.

Since we do not live in a perfect world, the opportunities created by computer and information technology are opportunities to change the way we do things *for the better*. Computer and information technology creates opportunities for new kinds of practices—new kinds of social arrangements, relationships, and institutions. Extending traditional norms and principles to the new possibilities runs the risk of reproducing undesirable practices or not improving on acceptable practices.

When computer programs were first being developed, many in the computing community saw the potential for software to be readily available to everyone, since programs could be copied without loss to the original developer. They also saw the potential for all kinds of information to be distributed

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cheaply and easily in the electronic medium. This was recognized to be an invention on the order of the printing press in importance but on an even grander scale. The debate about property rights and how to interpret and apply them to software is, in a sense, a debate about taking advantage of the special features of software to create a system of distribution that has never been possible before. Most recently, this debate is taking place around the distribution of music on the Internet.

To be fair to the traditionalist account, it need not be committed to adopting norms and policies that are identical to those that prevailed before computer and information technology. A traditionalist could take the position that traditional norms and principles must be modified when they are extended to new situations. In modifying their position in this way, the traditionalist moves somewhat away from recommending simply that we extend the old to the new. In this weaker version, there is the suggestion of something new being created in the process of extending old norms and principles.

The traditionalist account is a good starting place for understanding how the ethical issues surrounding computer and information technology are and should be resolved and how policy vacuums are and should be filled, but it has serious limitations. As a descriptive account, it does not capture all that is involved. Filling policy vacuums is not only a matter of mechanically applying traditional norms and principles. Conceptual muddles have to be cleared up, often a synthetic process in which normative decisions are invisibly made. Moreover, as a normative account, the traditionalist position runs the risk of not taking advantage of the new features of, and new opportunities created by, computer and information technology. Hence, we need to move beyond the traditionalist account.

COMPUTERS USED IN A SOCIAL CONTEXT

Clearing up the conceptual muddles and filling policy vacuums involves understanding the social context in which the technology is embedded. Computer and information technology is developed and used in a social context rich with moral, cultural, and political ideas. The technology is used in businesses, homes, criminal justice systems, educational institutions, medicine, science, government, and so on. In each one of these environments, there are human purposes and interests, institutional goals, social relationships, traditions, social conventions, regulations, and so on. All of these have an influence on how a new technology is understood and how policy vacuums are filled.

For example, by some measure of efficiency, it might be best for the United States, as a whole, to create one master database of information on individual citizens, with private and public agencies having access to appropriate segments of the database. There are, however, a variety of reasons why such an arrangement has not yet come about and is not likely to come about in the near

ISBN: 0-558-13856-X

future. These reasons include historically shaped social fears of powerful centralized government, beliefs about the inefficiency of centralized control, an already established information industry, a political environment favoring privatization, and so on.

Social context shapes the very character and direction of technological development. This is true at the macro level when we think about the development of computer and information technology over time. It is also true at the micro level when we focus on how specific applications are adopted and used at particular sites such as small businesses, college campuses, or government agencies. Imagine, for example, the process of automating criminal justice records in a local police station. The specifications of the system—who will have access to what, the kind of information that is stored and processed, the type of security, and so on—are likely to be determined by a wide variety of factors, including the unit's understanding of its mission and priorities, the existence of laws specifying the legal rights of citizens who are arrested and accused, the agency's budget, and the relationships the unit has with other criminal justice agencies.

One of the reasons the study of ethical issues surrounding computer and information technology is so fascinating is that in order to understand these issues, one has to understand the environments in which it is being used. In this respect, the study of computer ethics turns out be the study of human beings and society—our goals and values, our norms of behavior, the way we organize ourselves and assign rights and responsibilities. To understand the impact of computer and information technology in education or government, for example, we have to learn a good deal about what goes on and is intended to go on in these sectors. To figure out what the rules governing electronic communication should be in a particular environment, we have to explore the role of communication in whatever sector we are addressing. For example, because universities are educational institutions, they tend to promote free speech much more than would be tolerated in a business environment. And even in a university environment, attitudes toward free speech will vary from country to country.

The study of computer ethics may be seen as a window through which we view a society—its activities and ideals, the social, political, and economic forces at work. Perhaps the most important thing about computer and information technology is its malleability. It can be used to do almost anything that can be thought of in terms of a series of logical steps or operations, with input and output. Because of this malleability, computer and information technology can be used in a wide range of activities touching every aspect of human endeavor.

Computer and information technology can be used as much to keep things the same as to cause change. Indeed, as the traditionalist account suggests, when this technology enters a new environment, we tend, initially at least, to map the way we had been doing things onto the new computer system. The process of computerization often involves looking at the way people have been doing a particular task or set of tasks—bookkeeping, educating, manufacturing, communicating, and then computerizing those activities. Nevertheless, over time, these

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activities may be profoundly changed by the incorporation of new applications of computer and information technology.

It is important to recognize that while there may be a vacuum of policies with regard to computer and information technology, the technology is never used in a vacuum. Deciding what policies should reign in computerized environments, be they personal policies or policies for organizations, agencies, states, and countries requires understanding the social context in which the technology is used. This includes understanding the nature of the human relationships involved, institutional purposes and values, and prevailing norms of behavior. This social context is inextricably intertwined with the ethical issues that arise in that context. Policy vacuums cannot be filled without taking that social context into account.

MORAL AND LEGAL ISSUES

To say that computer ethical issues arise because there is a vacuum of policies leaves open whether the vacuum should be filled with *laws* or with something else. It is quite possible that some vacuums are better left to personal choices, institutional policies, or social conventions rather than to the imposition of law. It is also important to remember that this need not be an either/or matter. In a wide variety of cases, what seems to be needed is a multiplicity of approaches. For example, when it comes to proprietary software, intellectual property laws define what can and cannot be owned and how property rights are to be respected. Yet, corporations and government agencies supplement these laws with internal policies specifying what their employees can and cannot do in handling intellectual property. The internal policies interpret the law for the company or agency context, and tell employees how to address any vagueness in the law. As well, individuals will develop personal policies on the use of proprietary software (e.g., whether to obey the law or not, how to behave when the law is unclear).

Law is neither the beginning place nor the ending place when it comes to filling policy vacuums and addressing ethical issues. Ethical analysis precedes law when it is the basis for creation of a law. That is, our moral ideas often give rise to and shape the character of our laws. Think, for example, of minimum wage laws, of laws against racial and sexual discrimination, or of the way we have designed our criminal justice system to recognize the rights of the accused as well as the rights of the accuser. These aspects of our system of laws come from a shared sense of what is just and what is good. Criticisms of law and proposals for change in our laws are often based on a shared moral ideal that is not being achieved. In this regard, law is often not the final word. Think of the abortion debate or the debate about whether we should have compulsory or voluntary military service. These are issues that have been decided by legislation, even though individuals persist in having contrary moral opinions.

ISBN: 0-558-13856-X

To say that computer ethics is needed to fill the vacuum of policies surrounding computer and information technology is not simply to say that we need laws. In some cases, we do need laws, while in other cases, we need personal policies or institutional policies or social conventions or several of these. In all cases, we need ethical analysis to help us understand and decide how to fill the policy vacuums.

ARE COMPUTER ETHICAL ISSUES UNIQUE? FIRST ATTEMPTS

In trying to understand why computer and information technology raises ethical concerns and in what ways it does and does not change the environments in which it is used, the question of uniqueness inevitably arises. Are the ethical issues surrounding computer and information technology new? Are they unique? Or, are they the same old ethical issues that have engaged Western society for centuries?

In support of the idea that there is nothing unique about these issues is the old saying, "There's nothing new under the sun." Computer and information technology may well threaten privacy, but privacy issues have been around for ages, and they have often centered on new technologies. Consider concerns about the publication of photographs in newspapers, wiretapping, hidden cameras, and more recently urine, blood, and genetic testing. There have always been debates about privacy that involve who should have access to, and be able to use information about individuals. The same may be said about accountability and liability in computing. Computer and information technology challenges our traditional conception of responsibility and our system of accountability because it allows us to do many things remotely and anonymously, making it difficult to be identified or diffusing our sense of responsibility for the effects of our actions. However, this is not the first or only technology to disrupt traditional conceptions of responsibility. Nuclear weapons challenged our concept of responsibility insofar as they gave human beings the power to annihilate humanity. According to this argument, therefore, the ethical issues arising around computer and information technology are not unique.

To sort out this uniqueness issue, it is helpful to keep in mind a distinction between the uniqueness of the *technology* and the uniqueness of the *ethical issues*. The argument just described claims that none of the ethical issues surrounding computer and information technology fall outside the realm of ethics as traditionally conceived. It suggests, in other words, that we can categorize and discuss computer-ethical issues in familiar moral terms using traditional moral categories.

On the other hand, most of the arguments in favor of uniqueness seem to be focused on the uniqueness of *computer and information technology*. They suggest that since the technology is unique, the ethical issues must be unique. There are several provocative arguments worth mentioning.

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First consider the argument that computer technology has brought about the creation of *new entities*—programs, software, microchips, Web sites, video games, and so on. These things never existed before. The activity of encoding information on silicon chips could not have been conceived of sixty years ago. The ethical issues surrounding computer and information technology are unique, then, insofar as they deal with things that have never been dealt with before.

Another uniqueness argument is that computer and information technology has changed the *scale* of many activities, arrangements, and operations. This includes the scale of data collection, calculations, and statistical analysis, as well as the scale of communication. When it comes to data collection, think of the billions of bits of information about individuals that can now be recorded and analyzed. Much of the information is transaction-generated information (TGI). As you move through your day, most of your activities can be recorded: what you buy with your credit card, where and what you eat, phone calls that you make, where you drive (if you pass through toll booths), what sites you go to on the Web. Information about individuals was gathered and stored before computer and information technology, but not to the extent possible today because of this new technology.

The increased *scale of calculations* has facilitated the creation of more sophisticated machines such as robots, spaceships, and medical imaging equipment. While each of these was possible, in some sense, before computer and information technology, they were not possible on the scale that is possible today. The increased scale means much more sophisticated equipment. Moreover, the increased scale of information processing and statistical analysis has meant *new kinds of knowledge*. Knowledge about the solar system, about weather, and the economy is available only because of the scale (including speed) of data processing in computer and information technology. Transaction-generated information is a new kind of knowledge as is traffic patterns on the Internet.

Another argument that might be made for uniqueness, also connected to increased scale, has to do with the *inherent unreliability* of computer and information technology. Here the argument is that because of the complexity and scale of calculations involved in computer and information systems, the technology cannot be built without some degree of unreliability. That is, since no single individual can understand and check every step in many computer systems, reliability is always an issue, much more so than with other technologies. Techniques for testing computer systems are continuously improving but, the argument goes, testing is very different from having an individual understand what is going on in a computer system. This calls for, some would argue, an entirely new way of thinking about risk, accountability, and liability.

Yet another argument on behalf of the uniqueness of computer-ethical issues might be made by focusing on the *power and pervasiveness* of the technology. Computer and information technology is changing the character of everything that we do. The transformation of our world that is taking place is comparable to that of the industrial revolution. When taken separately, each new application of the technology may not look unique, but when taken as a

ISBN: 0-558-13856-X

whole, the impact of computer and information technology has been utterly revolutionary and therefore unique.

These arguments for uniqueness are fascinating, but notice that each one emphasizes something about the technology—the entities and kinds of knowledge it creates, the scale of operations it makes possible, and its powerful effects. None of the arguments touches on ethics or the uniqueness of the ethical issues per se. There seems to be something of a mis-match between those who claim that computer-ethical issues are unique and those who argue that the issues are not unique. On the one side, the fact that all the issues touch some familiar moral notion or ethical principle is emphasized. On the other side, the fact that computer and information technology has features or has created entities and situations that were not possible before, is emphasized. We have to delve more deeply into the matter to sort out this mismatch.

ARE COMPUTER ETHICAL ISSUES UNIQUE? A DEEPER ANALYSIS

It is helpful, in trying to get a handle on this issue, to clarify what is and is not in dispute. The uniqueness of computer and information technology is *not* in dispute. Computer and information technology is unique. While it has features in common with other technologies and while it may be thought of as an extension of earlier calculating machines, nothing with the power and capabilities of computer and information technology ever existed before. The claim that computer and information technology creates situations that never existed before is, also, *not* in dispute. Before this technology, it was not possible to launch computer viruses, to make images of internal human organs in the detail that is now possible, or to monitor, record, and analyze every second of an employee's activity as we can today. What *is* in dispute is whether this unique technology and the situations it creates pose unique ethical issues. Are the *ethical issues* surrounding computer and information technology special, unusual, or distinct in some way?

New Species of Traditional Moral Issues

The answer to this question seems to lie in putting together the kernel of truth on each side of this debate. I propose that we think of the ethical issues surrounding computer and information technology as *new species of general, or traditional moral issues*. The idea is that the ethical issues surrounding computer and information technology can be understood as variations of traditional ethical problems or issues. They involve familiar moral concepts such as privacy, harm, taking responsibility for the consequences of one's action, putting people at risk, and so on. At the same time, the presence of computer and information technology often means that the issue arises with a new twist—a new

ISBN: 0-558-13856-X

feature, a new possibility. The presence of this new feature or new possibility makes it difficult to draw on traditional moral concepts without some interpretation, modification, or qualification.

Once again, the ownership of computer programs in the early days of computing illustrates the point. Issues of ownership and property had been around for centuries, long before the advent of computer technology. However, never before computer technology had property rights issues arisen with regard to the cluster of characteristics distinctive of computer software. Before computers, it was inconceivable that a sequence of steps expressed as a series of ones and zeros could have value, let alone be considered a candidate for ownership. On the one hand, then, software ownership did not create a new type—in the sense of new "category"—of ethical issue. Property disputes were common and familiar. On the other hand, the issue was new in the sense that property in something with the features of software had never been addressed before.

In terms of uniqueness, then, the software ownership issue is not unique in the sense that it is an ownership issue and ownership is an old—familiar, standard—ethical issue. Th software ownership issue is unique, however, in the sense that it involves ownership of something that had never been a candidate for ownership before. Both of these points are captured in the idea of genus and species. The software ownership issue is a new and unusual species of a familiar ethical (and legal) genus of issues.

To put this in yet another way, we know that human beings often want to own and control that which has value. Computer programs have value in our society. This is neither new nor surprising. The only thing new here is that software has features that are distinct from other things that have been defined as property. Software has features that make it difficult (as discussed earlier) to mechanically apply current norms and laws. Whether or not and how various aspects of computer software should be owned poses a new species of a not-so-new ethical issue.

The genus-species account emphasizes the idea that the ethical issues surrounding computer and information technology are first and foremost ethical issues. This is an important point because ethical issues are always about human beings and what they do to one another. Ethics has to do with human interactions, human interests, human harm, and conflicts between human beings. An ethical issue arises when something that human beings value is at stake. It may be something as profound as a right to life or a right to be treated fairly, or it may be something as complicated as assigning liability in a way that will have good consequences. It may be a matter of deciding what the rules should be when it doesn't make a big difference whether it is rule A or B as long as there is a rule (e.g., which side of the road automobiles ride on).

Oddly, the connection between ethics and human interaction is sometimes missed by computer ethicists who are focused on the uniqueness of the technology. Maner (1998) for example, provides a set of examples of ethical

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issues surrounding computer and information technology that he considers weakly or strongly unique. However, his examples emphasize the uniqueness of the technology or technical arrangement, not the uniqueness of the human situation. One of his examples is the ethical argument for making computer technology available to the handicapped. Maner argues that computer technology is unique because of its general applicability and this generality leads to an obligation to make computer technology available to the handicapped. In other words, Maner argues that because computer technology has the potential to benefit the handicapped in a way that no other technology can, we have a unique obligation to provide computers to the handicapped. He writes:

> My point is that our obligation to provide universal accessibility to computer technology would not have arisen if computers were not universally adaptable. The generality of the obligation is in proportion to the generality of the machine. . . . Even if elevators did provide a comparable case, it would still be true that the availability of a totally malleable machine so transforms our obligations that this transformation itself deserves special study. (p. 145)

The case for making computer technology available to the handicapped may be strong, and I would not want to argue against it. However, Maner's claim is that there is something unique about the obligation to provide *computer technology* to the handicapped. He argues that this case is distinct from others on behalf of providing something to the handicapped. Maner seems to be confusing the uniqueness of the technology with the uniqueness of the moral situation. As an ethical argument, the argument is far from new. It appeals to a familiar moral obligation, an obligation to help those who are in need (i.e., to help those whose lives can be significantly improved with help). At a deeper level and more subtly, the argument appeals to the value of autonomy (i.e., to helping those who could, with our help and the help of computers, become more autonomous).

Maner suggests that the novelty of the argument lies in its inference from the generality (malleability) of computer technology and never before, he claims, has a technology of this kind been available. In other words, he seems to be saying that never before has humanity been in a situation to be able to so powerfully help the handicapped. I am not sure if this is true, but in any case, it illustrates the puzzle around uniqueness.

The puzzle seems to arise because the technology is unique, and since it is unique, an argument for making it accessible has features that other arguments lack. (Compare, for example, this argument with the argument for making public transportation available to the handicapped.) The argument is not unique insofar as it appeals to special features of a technology. There are good arguments for distribution of other technologies, not just to the handicapped but universally. Think of the good that would come from universal access to disease-preventing vaccines, life-saving medical technologies, or food, for that matter. In parallel to Maner's argument, one could argue that because of the

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enormous power of these things to do good, we have an obligation to make them available to those who will benefit from them.

Maner's argument illustrates the virtue of the genus/species account in allowing us to identify what is and is not unique about the ethical issues surrounding computer and information technology. His argument appealing to the generality of computer technology is a new species of moral arguments of the kind that appeal to an obligation to help people in need and who would benefit from access to something. This genus of argument connects the obligation to help those in need with the power and availability of a technology to help. The genus is not new; it is familiar. At the same time, Maner's argument is a species unlike any that has come before insofar as it appeals to the generality of computer technology, assuming nothing with the generality of computers ever existed before. It is a new version and a unique species of a familiar genus of arguments.

That the ethical issues associated with computer and information technology can all be categorized and analyzed using traditional ethical theories and concepts should not surprise us. We would not be able to recognize these issues as ethical issues unless they were connected in some way or another to our traditional ethical concepts such as harm, responsibility, privacy, and property. Imagine creatures from outer space suddenly appearing. They look somewhat similar to human beings; they walk and talk like us, but every once in a while they behave in strange ways. What would we think about this behavior? We would have no basis for claiming that it was immoral except if the behavior had characteristics that violated or conformed to our moral norms. If, for example, the behavior resulted in the death of a human being or if the behavior could be described as lying, then we would be inclined to call it immoral or bad. This may seem farfetched, but it isn't that off mark when one remembers (as discussed near the beginning of this chapter) that computer and information technology give human beings the capacity to do things they couldn't do before—visiting a Web site, launching a computer virus, anonymously engaging in role playing games with people thousands of miles away. These behaviors might be treated as morally neutral unless they connected in some way to a familiar moral concept such as harm or responsibility or privacy.

Instrumentation of Human Action

Why does computer and information technology create ethical issues? It changes the instrumentation of human action. The physical events that occur when an individual acts in a computerized environment are different from those that occur when an individual makes the same movements in an environment with no computers. When I write a paper by hand, the pencil moves over paper. When I write using a typewriter, levers and gears move. When I write using a computer, electronic impulses change configurations in microchips. In

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this example, the changes in physical events that take place when I write seem morally *in*significant. In all three cases I create words and a text. However, there are many cases in which the switch from no technology to technology, or from one technology to another changes not just the physical events constituting an action, but the moral character of the action.

As described earlier in this chapter, often what changes are the possibilities for action. A good example here is the act of launching a computer virus. Computer technology and the Internet have made it possible for an individual, sitting alone in a room, to move his or her fingers over a keyboard, pressing various keys, and with these simple movements, launch a virus that wreaks havoc in the lives of thousands of people. The technology has instrumented an action not possible (indeed, not even comprehensible) without it.

A world instrumented with computer and information technology has very different possibilities for human action than a world without it. Consider other illustrations. When a business automates its workplace, it acquires the ability to create and manipulate data in a way that would have been (practically) impossible before. In the new environment, employees who perform routine tasks also create records of their activities. When customers make purchases from an automated business, they no longer simply give cash in exchange for a product; they may simultaneously create an enduring record of their transaction, a record that can be combined with other records to create a profile of the customer. Hence, the act of purchasing something is potentially a very different act in a computerized environment than in a noncomputerized environment. Similarly, when speaking face to face, the default situation is that spoken words disappear after they are spoken (except insofar as they remain in the memory of those who have heard them). On the other hand, in communicating the same words to the same person in an e-mail exchange, the default position is that the words endure. Effort has to be made to remove the words from the system. So, actions or action-types are instrumented differently in computerized and noncomputerized environments, and the difference in instrumentation can have moral significance.

Consider yet other examples of how the change in instrumentation can have moral significance. Driving on an intelligent highway (one that records license plates as cars pass through toll booths) is different than driving on an ordinary highway; the difference is morally significant in that the intelligent highway has the potential to intrude on privacy. Buying a software package is morally different from buying a lawnmower in the sense that you can more easily violate property rights with software by making copies of the software. Communicating on the Internet is morally different from communicating face-to-face because of the potential for anonymity.

In some cases, computerization adds features to the situation while in other cases it seems more accurate to say that certain features of action are enhanced or constrained. In business transactions, for example, even without computer technology, a company could have created and retained records of

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all their sales, or they could have set up cameras to record every movement of their employees. To do so would have been difficult and costly, but would, nevertheless, have been possible. Computerization facilitates the capacity for recording and maintaining records of transactions and employee activities; it makes the recording cheap, instantaneous, and practically effortless. In this case it may be more accurate to say that a possibility has been facilitated or enhanced rather than created. Similarly, prior to the development of computer and information technology we had the ability to communicate with colleagues in other countries via mail or expensive telephone calls. The development of the Internet did not create a new possibility; rather, it enhanced and facilitated the possibility of international communication by making it more convenient and quicker.

Computer technology creates a new instrumentation for human action, both for individual action and for institutional arrangements. The new instrumentation changes the character of some actions and enhances and facilitates others. It creates the possibility of actions and arrangements that weren't possible before.

Ethical analysis has not traditionally or explicitly focused on the instrumentation of action. Rather, ethicists have emphasized ethical theory, leaving the details for practice and not recognizing that the instrumentation of action can have moral significance. Yet, ethical analysis always presupposes an instrumentation of action; it presupposes a physical world of a particular kind and human bodies with particular features. The ethical issues surrounding computer and information technology draw attention to this largely ignored aspect of ethics.

The character of the physical world in which humans act has continuously changed over time, often because of technology. Think of dams, plumbing, electricity, automobiles, and so on. One could argue that computer and information technology is just another step in a series of ongoing changes that have altered the instrumentation of human action. Airplanes, guns, bombs, and computers have all changed what human beings can do with movements of their bodies. These technologies have all changed the configuration of the physical world in which human beings act and live. They have all made it possible for human beings to perform actions not possible before (without) a given technology—firing guns, flying, giving and receiving organs, dropping bombs, and cloning. They have all facilitated and burdened various aspects of human action.

New possibilities and newly favored and disfavored features give rise to ethical issues because traditional moral concepts and norms presupposed a world instrumented in a different way. The new instrumentation gives rise to new species of general types of moral issues.

This account of the ethical issues surrounding computer and information technology, as new species of familiar moral issues, is meta-ethical. It is about how ethical issues are identified, classified, and then addressed. To say that the ethical issues surrounding computer and information technology are new

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species of familiar moral issues is not to say, however, that the new species always fit neatly into familiar categories. It is not uncommon for a new species to challenge traditional categories or straddle several categories. Sometimes, computer and information technology instrument human action in ways that seem to challenge our ordinary moral concepts or categories.

The ethical issues surrounding computer and information technology are not new in the sense that we have to create a new ethical theory or system. They call upon us to come to grips with new species. This means understanding the new issue in familiar moral terms, using traditional moral concepts. For the most part this is consistent with the traditionalist account because once connected to standard moral categories and concepts, the new issue can be addressed by extending familiar moral concepts to the new situation and drawing on our experience with other cases. However, the new species may not fit easily into standard categories and concepts; allowances for the special or new features of the new situation have to be taken into account. New species have special features and, as pointed out earlier, if we simply treat them as the same as other, familiar cases, we may fail to recognize how the new features change the situation in morally significant ways.

THE ROLE OF ANALOGY IN COMPUTER ETHICS

Analogical Reasoning Is Useful

Earlier I explained how policy vacuums surrounding computer and information technology can and should be filled by working through conceptual muddles and understanding the environment in which the technology is being used. One very useful way to do this is *reasoning by analogy*. Reasoning by analogy involves looking for familiar situations comparable to the one involving computer and information technology, and then either accepting the equivalence of certain actions, or identifying the significant differences between the cases.

Consider computer hacking. This activity will be discussed more extensively in Chapter 4, but for now let us consider a simple case. A hacker breaks into someone's computer and looks around at the various files. How are we to conceptualize this behavior? One way is to make an analogy with breaking into someone's office and then into their file cabinet. Is there a moral difference between the one act and the other? Certainly it is true that the physical movements required to get access to electronic files are quite different from those required to break into an office and into a file cabinet. Nevertheless, both actions involve obtaining access to information an individual has stored with the intention that others would not have access. In this respect the analogy seems to work. If we can't find any morally significant difference between the two cases, then we cannot (with consistency) claim that one type of behavior is morally permissible and the other is not.

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Consider a slightly more complicated example of reasoning by analogy. Isn't going online and "playing around" by seeing just what systems or files you can get access to, comparable to walking down a street and testing the doors of every house on the street to see if they are locked? Suppose when you find a door unlocked (a file accessible), you go in and look around. You may not change or take anything from the house (file). You simply look at what the owner has put in her or his drawers (what she or he has stored in various files). Now, what, if anything, is different about these two cases? Is testing to see if you can get access to computer systems comparable to testing doors on houses, or is it different? From the point of view of the person who is being intruded upon, both types of actions may be felt to be intrusions of privacy and a violation of property rights. Whatever one says about the comparability or non-comparability of these cases, the analogy helps to focus attention on the character of the action at issue. Analogies help us to understand the human relationships and action types that are at issue. They help us to classify and connect behavior in computerized environments to familiar ethical notions and principles.

The hacker analogy can be carried a bit further. Am I partially responsible if someone enters my house after I forgot to lock my door? Alternatively, suppose the analogy is made to yards and gates. I left my gate unlocked and I have a swimming pool in my yard. The law generally recognizes that individuals have a responsibility to take measures to protect others from the dangers of their swimming pool. Many local statutes require that one build a fence around the pool. There are computer comparables here. Perhaps, we should expect individuals to take measures to protect their files, especially if they contain sensitive data. We could pass legislation to this effect, or through court cases set precedents that make the responsibilities of computer users clear, and diminish the responsibility of trespassers where owners have not made efforts to protect their files. The point here is that analogical thinking can often be helpful in sorting out an ethical issue arising around computer and information technology.

Analogical Reasoning Is Dangerous

While analogical reasoning can be useful in sorting out an ethical issue arising in a computerized environment, caution is, nevertheless, in order. Reasoning by analogy has some dangers which can only be avoided by fully developing the analogy. Analogies are useful because they allow us to draw upon situations or technologies with which we are familiar. They help us to see rules or principles that might be relevant in the computer situation. The danger is that we may be so taken with the similarities of the cases that we fail to recognize important differences. For example, in arguing about online break-ins and the dissemination of computer viruses, hackers sometimes put forth the argument that they are providing a service by identifying and revealing the flaws and vulnerabilities in computer systems, so that they can be fixed. Countering this argument, Eugene Spafford (1992) uses a powerful analogy. He suggests

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that the hacker's argument is comparable to arguing that it is morally permissible to set a fire in a shopping mall to show the flaws in the fire protection system. Launching a computer virus on the Internet has some parallels to starting a fire in a shopping mall but this analogy is so powerful that we might immediately jump to the conclusion that since one is wrong, the other must also be wrong. We should first ask whether there are any important differences. Some might argue that lighting a fire in a shopping mall puts individual lives at risk, while most computer viruses do not. Both actions cause property damage, but the damage done by most computer virus can be repaired more easily.

It is important to remember that while analogical reasoning can be extremely useful in understanding the ethical issues surrounding computer and information technology, it also has dangers. When reasoning by analogy it is important to identify the differences as well as the similarities between the computer and noncomputer cases.

CONCLUSION

A variety of ethical issues surrounding computer and information technology have now been introduced. We began with what might be thought of as metaethical questions. Why does computer and information technology create ethical issues? How can and should we understand and resolve ethical issues around computer and information technology. Ethical issues arising around computer and information technology arise in a social context and often they involve conceptual muddles. In analyzing computer ethical issues, we can and should draw on traditional moral concepts and theories, but in doing so, we should be careful not to miss new opportunities created by the technology. We should be aware that we are making the technology, not just discovering it. Computer and information technology creates new possibilities; it instruments human action in new ways. The ethical issues that are thereby created are not out of the realm of human understanding, but they have unique features with which we must come to grips. The issues are best understood as new species of generic moral issues.

STUDY QUESTIONS

1. Explain what it means to say that computer and information technology creates new possibilities for human behavior. Give examples.
2. How does computer and information technology create policy vacuums? Give examples.
3. What is the central task of computer ethics according to J. Moor?
4. Why are the policy vacuums arising from computer and information technology sometimes difficult to fill?

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5. What is the traditionalist account? Explain it as a descriptive account of how computer ethics is done and as a normative account of how computer ethics should be done.
6. What are the limitations of the traditionalist account as a descriptive account? As a normative account?
7. Why is the social context in which computer and information technology is used so important to computer ethics?
8. Why isn't law sufficient to fill all the policy vacuums?
9. What aspects of computing and computers support the claim that computer ethical issues are unique?
10. Why isn't Maner's example of a unique ethical issue successful at illustrating uniqueness?
11. Explain the author's claim that computer ethical issues are new species of generic moral issues.
12. When human action is instrumented with computer and information technology how is human action changed?
13. What is analogical reasoning? What are the benefits and the dangers of using analogical reasoning in computer ethics.

SUGGESTED FURTHER READING

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