Self-Assessment Procedure IX

A self-assessment procedure dealing with ethics in computing

Edited by Eric A. Weiss, Sun Company
from a book* by Donn B. Parker, SRI International

What is Self-Assessment Procedure IX?

This is the ninth self-assessment procedure. The earlier ones appeared in Communications in May 1976, May 1977, September 1977, February 1978, August 1978, August 1979, August 1980, and October 1981. The first seven are collected in a single volume available from ACM.**

This procedure deals with ethics, in particular with the special ethical considerations in the computer field that arise from the unique characteristics of computers and their use.

The earlier procedures dealt with technical subjects. This is the first to deal with a nontechnical subject, but it shares with the earlier procedures the basic educational aim of self-assessment. The procedure is short and is neither exhaustive nor balanced in its coverage. It merely provides a path to some self-assessment.

What is Self-Assessment?

Self-assessment is based on the idea that a question and answer procedure can be devised that will help a person appraise and develop his or her knowledge about a particular topic. In the case of ethics, the objective is understanding rather than knowledge. Thus, the objective of this procedure is to help the reader think about ethics and ethical behavior.

Self-assessment is intended to be an educational experience for a participant. In this case, the educational experience is to be that which will come about as a result of adult conscientious thought. The scenarios and the associated questions are only the beginning of the procedure. The scenarios were selected to help the participant think about the ethical concepts and to decide whether to pursue the matter further.

The primary motivation of self-assessment is not for an individual to satisfy others; rather it is for the participant to appraise and develop himself or herself. This means that there are several ways to use a self-assessment procedure. The only test of whether the use has been satisfactory is that if at the end of the procedure the participant can say, “Yes, this has been a worthwhile experience” or “I have gained some understanding.”

How to Use this Self-Assessment Procedure

We suggest the following way of using the procedure, but, as noted earlier, there are others. This is not a timed exercise; therefore, plan to work with the procedure when you have an hour to spare, or you will be short-changing yourself on this educational experience.

First reproduce four copies of the page of the Reader Scenario Analysis Form in Part IV (page 188).

Next read Part I, the Introduction. It explains why there is a need for special ethical considerations in the computer field and lists computer-specific ethical issues.

Then read Part II, the ACM Code of Professional Conduct. This gives the ethical principles, ideals, and rules for behavior considered to be applicable to ACM members.

Now read the first scenario in Part III, pause, delib-
erate, reach your own conclusion and note your opinions on a copy of the Reader Scenario Analysis Form reproduced from the form provided in Part IV. The Committee thinks it would be particularly appropriate to add a note which would key your analysis to the ACM Code.

Consider the scenario in more detail and try to look at it from different points of view. See if your analysis leads you to any other thoughts. Revise your analysis form or fill out a new one.

No suggested responses are provided, but Part V of the procedure gives the votes, opinions, and suggested ethical principles applied to each scenario by the participants in a project described in Reference 1. You may compare your conclusion with theirs.

Now loop to the next scenario in Part III.

The Introduction, scenarios, and panel responses are reprinted from Reference 1, which gives the details of how the project was conducted and includes more extended remarks on ethics.

The Committee is particularly anxious to get responses concerning this new kind of self-assessment procedure. You may respond either by sending in copies of your Reader Scenario Analysis Forms or by letter commenting on any aspect of the matter.

The Committee will prepare a summary of the responses and submit it for publication in *Communications*, and will refer appropriate responses to the ACM Committee on Professional Standards and Practices.

Approved and submitted by the ACM
**COMMITTEE ON SELF-ASSESSMENT**
*a committee of the ACM EDUCATION BOARD*

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**Self-Assessment Procedure IX**

This self-assessment procedure is not sanctioned as a test nor endorsed in any way by the Association for Computing Machinery. Any person using any of the questions in this procedure for the testing or certification of anyone other than himself or herself is violating the spirit of this self-assessment procedure and the copyright on this material.

**Contents**

- Part I. Introduction
- Part II. ACM Code of Professional Conduct
- Part III. Scenarios (numbered as in Reference 1)
- Part IV. Reader Scenario Analysis
- Part V. Panel Responses
- Part VI. Reference and Bibliography
Part I. Introduction

The need for special ethical considerations in the computer field arises from several unique characteristics of computers and their use. Computers are rapidly becoming the primary repositories of negotiable assets and representations of many other assets in new forms consisting of electronic pulses and magnetic patterns. These assets are not directly subject to manual handling and observation; they can be obtained and used only through technical and automated means. The concentration in computer and data communications systems of vital business information, research and development data, marketing information, and personnel and other statistical data of organizations has created a power base in electronic data processing (EDP) departments. Because computer technology places a new power in the hands of the technologists who deal with data storage, processing, and dissemination, personal privacy and fair information practices have become major legislative issues. At the same time, however, the technology offers a practical means of constraining and regulating information usage.

Unlike the computer field, other sciences and professions have had hundreds of years in which to develop ethical concepts that form the basis for dealing with new issues. Biologists debate issues in genetic research, medical practitioners are concerned with definitions of death and abortion, engineers must cope with the safety of nuclear reactors and the handling of atomic waste materials. Congress debating its rules of ethics, lawyers evaluate the implications of Watergate, and auditors ponder their responsibilities to detect business fraud. The codes of ethics for these disciplines are enforced in varying degrees at various times. They are well-established codes; but perhaps more importantly, an ethical continuity is maintained in each discipline as these codes are transferred from professor to student in universities. In contrast, computer science and technology have been in existence for only 30 years. The need for ethical standards in computer science and technology is equally as critical as it is in other fields. It is little wonder, therefore, that serious problems arise in developing ethical concepts and practices in such a comparatively short period of time.

Computer-specific ethical issues arise as the result of the roles of computers such as:

- Repositories and processors of information. Unauthorized use of otherwise unused computer services or of information stored in computers raises questions of appropriateness or fairness.
- Producers of new forms and types of assets. For example, computer programs are entirely new types of assets, possibly not subject to the same concepts of ownership as other assets.
- Instruments of acts. To what degree must computer services and users of computers, data, and programs be responsible for the integrity and appropriateness of computer output?
- Symbols of intimidation and deception. The images of computers as thinking machines, absolute truth producers—infallible, subject to blame—and as anthropomorphic replacements of humans who err should be carefully considered.

Part II. ACM Code of Professional Conduct

PREAMBLE

Recognition of professional status by the public depends not only on skill and dedication but also on adherence to a recognized Code of Professional Conduct. The following Code sets forth the general principles (Canons), professional ideals (Ethical Considerations), and mandatory rules (Disciplinary Rules) applicable to each ACM member.

The verbs "shall" (imperative) and "should" (encouragement) are used purposefully in the Code. The Canons and Ethical Considerations are not, however, binding rules. Each Disciplinary Rule is binding on each individual Member of ACM. Failure to observe the Disciplinary Rules subjects the Member to admonition, suspension, or expulsion from the Association as provided by the Procedures for the Enforcement of the ACM Code of Professional Conduct, which are specified in the ACM Policy and Procedures Guidelines. The term "member(s)" is used in the Code. The Disciplinary Rules of the Code apply, however, only to the classes of membership specified in Article 3, Section 4, of the Constitution of the ACM.†

† Editor's Note: The Constitution of the ACM was last published in Communications, July 1980, pp. 420-426. Although the section referenced doesn't specify classes of membership, the intent of the Code is that the rules apply only to individual members and not to corporate members.
An ACM member should strive to increase his competence and the competence and prestige of the profession.

Ethical Considerations
EC2.1. An ACM member is encouraged to extend public knowledge, understanding, and appreciation of information processing, and to oppose any false or deceptive statements relating to information processing of which he is aware.
EC2.2. An ACM member shall not use his professional credentials to misrepresent his competence.
EC2.3. An ACM member shall undertake only those professional assignments and commitments for which he is qualified.
EC2.4. An ACM member shall strive to design and develop systems that adequately perform the intended functions and that satisfy his employer’s or client’s operational needs.
EC2.5. An ACM member should maintain and increase his competence through a program of continuing education encompassing the techniques, technical standards, and practices in his fields of professional activity.
EC2.6. An ACM member should provide opportunity and encouragement for professional development and advancement of both professionals and those aspiring to become professionals.

Disciplinary Rules
DR2.1. An ACM member shall not use his professional credentials to misrepresent his competence.
DR2.3.1. An ACM member shall not undertake professional assignments without adequate preparation in the circumstances.
DR2.3.2. An ACM member shall not undertake professional assignments for which he knows or should know he is not competent or cannot become adequately competent without acquiring the assistance of a professional who is competent to perform the assignment.
DR2.4.1. An ACM member shall not represent that a product of his work will perform its function adequately and will meet the receiver’s operational needs when he knows or should know that the product is deficient.

CANON 3
An ACM member shall accept responsibility for his work.

Ethical Considerations
EC3.1. An ACM member shall accept only those assignments for which there is reasonable expectancy of meeting requirements or specifications, and shall perform his assignments in a professional manner.

Disciplinary Rules
DR3.1.1. An ACM member shall not neglect any professional assignment which has been accepted.
DR3.1.2. An ACM member shall keep his employer or client properly informed on the progress of his assignments.
DR3.1.3. An ACM member shall not attempt to exonerate himself from, or to limit his liability to clients for his personal malpractice.
DR3.1.4. An ACM member shall indicate to his employer or client the consequences to be expected if his professional judgment is overruled.

CANON 4
An ACM member shall act with professional responsibility.

Ethical Considerations
EC4.1. An ACM member shall not use his membership in ACM improperly for professional advantage or to misrepresent the authority of his statements.
EC4.2. An ACM member shall conduct professional activities on a high plane.
EC4.3. An ACM member is encouraged to uphold and improve the professional standards of the Association through participation in their formulation, establishment, and enforcement.

Disciplinary Rules
DR4.1.1. An ACM member shall not speak on behalf of the Association or any of its subgroups without proper authority.
DR4.1.2. An ACM member shall not knowingly misrepresent the policies and views of the Association or any of its subgroups.
DR4.1.3. An ACM member shall refrain from expressing partisan statements about information processing by indicating clearly on whose behalf they are made.
DR4.2.1. An ACM member shall not maliciously injure the professional reputation of any other person.
DR4.2.2. An ACM member shall not use the service of or his membership in the Association to gain unfair advantage.
DR4.2.3. An ACM member shall take care that credit for work is given to whom credit is properly due.

CANON 5
An ACM member should use his special knowledge and skills for the advancement of human welfare.

Ethical Considerations
EC5.1. An ACM member should consider the health, privacy, and general welfare of the public in the performance of his work.
EC5.2. An ACM member, whenever dealing with data concerning individuals, shall always consider the principle of the individual’s privacy and seek the following:
   —To minimize the data collected.
   —To limit authorized access to the data.
   —To provide proper security for the data.
   —To determine the required retention period of the data.
   —To ensure proper disposal of the data.

Disciplinary Rules
DR5.2.1. An ACM member shall express his professional opinion to his employers or clients regarding any adverse consequences to the public which might result from work proposed to him.
Part III. Scenarios
(Numbered and Identified as in Reference 1)

Scenario 1.8

PROFESSOR, UNIVERSITY: NOT GIVING CREDIT FOR ASSISTANCE

A professor of computer science at a university developed a new computer programming language for a range of computer applications. Two of his graduate students tested the language for consistency and completeness. They discovered and corrected several significant shortcomings and added several new features. A programmer on the staff of the university's computer center programmed the compiler for the language. He discovered flaws in the syntax and corrected them, with the permission of the professor. He also found ways to change the language that improved the compiler performance. The graduate students and programmer documented the language and the compiler, and they wrote a user's manual.

The professor compiled the writings into a scientific paper and published it under his own name alone, with no acknowledgment of the contributions of the graduate students or the programmer.

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Pause, deliberate. Is there an ethics issue involved? Were the professor's actions unethical or not unethical? What general principles apply? Record your responses on the form in Part IV. (Panel responses are given in Part V.)

Scenario 1.9

PROGRAMMER, TIME-SHARING SERVICES: INFILTRATING A RIVAL COMPANY'S COMPUTER SERVICE

A programmer employee of a time-sharing computer service company signed an agreement to purchase time-sharing services from a competing company. He used the services for over a year and promptly paid his bills. Nothing in the agreement he signed, messages to him from the system, nor the user's manual issued to him limited his actions in the computer as long as he paid for the time used.

He routinely attempted to obtain copies of the data and programs, i.e., other users' and the service company's files, to obtain copies of system and utility programs, to identify other customers and ascertain their billings, to test programs without charge for which there is normally a charge, and to gain privileged access available only to the service company employees. He also attempted to "crash" the system (cause loss of service to others).

He claimed there were no limitations placed on him to prohibit him from doing these things, and that he was simply engaged in accepted business intelligence activities and reverse engineering (General Motors buying a Ford to see how it was made and constructed).

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Pause, deliberate. Is there an ethics issue involved? Was the programmer's action unethical or not unethical? What general principles apply? Record your responses on the form in Part IV. (Panel responses are given in Part V.)

Scenario 2.5

PROGRAMMER, BUSINESS ENTERPRISE: SELLING A PROGRAM NO LONGER USED

A computer programmer works for a business enterprise. He participated, along with other programmers, in the development of a major application computer program. When the application was finished, the business changed its business activities, no longer needed the program, and never used it. The programmer discovered that there was a possible market for the program, with customers who would purchase licensed use of the program, along with the service of programmers who would adapt and service the program. He suggested to his employer the sale of the program in this fashion, but found there was no interest in marketing it.

The programmer decided that he would go into business for himself, marketing copies of the program and documentation, and providing services in conjunction with the sales. He had few personal resources to do this, so he started the business while he was still employed. He was fearful of telling his employer about his side business because he was sure he would be fired, and that attempts would be made to stop him. He was also not certain that the business would succeed and wanted to be sure he could retain his present job if it did not pan out.

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Pause, deliberate. Is there an ethics issue involved? Were the programmer's actions (marketing the program, moonlighting to start a new business) unethical or not unethical? What general principles apply? Record your responses on the form in Part IV. (Panel responses are given in Part V.)

Scenario 2.7

PROGRAMMER, PERSONAL PROGRAM: TAKING THE PROGRAM TO HIS NEW POSITION

A computer programmer worked for a business enterprise that was highly dependent on its own computer system. He was the sole author of a computer program he used as an aid in his programming work. Nobody else used the program, and his manager was only nominally aware of its existence. He had written it and debugged it on his own time on a weekend, but had used his employer's materials, facilities, and computer services.

The programmer terminated his employment, giving due notice, and with no malice on his or his manager's part. He immediately went to work for a competitor of his former employer.

Without his former employer's permission, he took the only copy of the program with him to his new employer and used it in his work. He did not share it with any others. The new employer was not aware of the program or its use, but it enhanced the programmer's performance.

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Pause, deliberate. Is there an ethics issue involved? Was the programmer's action unethical or not unethical? What general principles apply? Record your responses on the form in Part IV. (Panel responses are given in Part V.)

Communications March 1982
of Volume 25
the ACM Number 3
Scenario 3.4

SCIENTIST, PROGRAMMER, FILES OF PERSONAL DATA: MAKING NEW USE OF DATA WITHOUT SUBJECTS' PERMISSION

A scientist employed as a researcher in a university learned that two different kinds of data on essentially the same subject pool were contained in two files stored in the university's computer. He believed that there would be significant scientific value in merging the files and reanalyzing the data.

Although the subjects' informed consent had been obtained for the earlier studies (they were students who had since graduated), their permission for this new use for the data had not been sought. Although the scientist was aware that it would have been desirable to seek permission of the subjects, he decided not to do so because it would have been time-consuming and would have added considerably to the cost of the study he was proposing.

He thus asked one of the university's programmers to access the data, merge the files on the same subjects, and analyze the data as he indicated. The programmer did as the scientist requested.

Pause, deliberate. Is there an ethics issue involved? Were the scientist's or the programmer's actions unethical or not unethical? What general principles apply? Record your responses on the form in Part IV. (Panel responses are given in Part V.)

Scenario 3.5

PROGRAMMER, EMPLOYER, GOVERNMENT, PERSONAL DATA: USING GOVERNMENT-OWNED PERSONAL DATA FOR BUSINESS PURPOSES

A marketing company's employee was doing piecework production data runs on company computers after hours under contract for a state government. Her moonlighting activity was performed with the knowledge and approval of her employer.

The data were questionnaire answers of 14,000 public school children. The questionnaire contained highly specific questions on the domestic life of the children and their parents. The government's purpose was to develop statistics for behavioral profiles, for use in public assistance programming. The data included the respondents' names, addresses, and so forth.

The employee's contract contained no divulgence restrictions, except a provision that statistical compilations and analyses were the property of the government.

The employer discovered the exact nature of the information in the tapes and its value in the business services his company supplied. He requested that the data be copied for subsequent use in his business. The employee decided the request did not violate the terms of the contract, and she complied.

Pause, deliberate. Is there an ethics issue involved? Were the systems analyst's actions unethical or not unethical? What general principles apply? Record your responses on the form in Part IV. (Panel responses are given in Part V.)

Scenario 4.3

SYSTEMS ANALYST, SOFTWARE COMPANY: DESIGNING A COMPUTER SYSTEM TO REPLACE A CUSTOMER'S EMPLOYEES

A systems analyst in a software development company was made leader of a project for a customer to develop a new computer application that was designed to replace as many production workers as possible in the customer's factory.

The systems analyst's brother-in-law was one of the workers to be replaced. He convinced the systems analyst that the workers would be laid off and would not be assisted in any way by their employer in finding new jobs. In keeping with the objectives and spirit of the contract between his employer's company and the customer, the systems analyst continued his design work maximizing as diligently as possible the number of production workers who could be replaced.

Pause, deliberate. Is there an ethics issue involved? Were the systems analyst's actions unethical or not unethical? What general principles apply? Record your responses on the form in Part IV. (Panel responses are given in Part V.)

Scenario 4.4

PROJECT LEADER, MANAGEMENT, RETAIL COMPANY: INSTALLING AN INADEQUATE SYSTEM

A programmer analyst was given project responsibility to develop a customer billing and credit system for his employer, a large retail business. He thought the budget and resources he was given were adequate. However, the budgeted amount was expended before completion of the system. He had continually warned management of impending problems, but was directed to finish the development as soon as possible and at lowest cost. He was forced by management to do this foregoing many of the program functions, including audit controls, safeguards, flexibility, error detection and correction capabilities, automatic exception handling, and exception reporting. A "bare bones" system was installed. He was told that he could add all the omitted capabilities in subsequent versions, after production of the initial system.

A difficult, expensive, and extensive conversion to the new system occurred. After the new system was in production, great problems arose. Many customers received incorrect and incomprehensible billings and credit statements and became outraged. The retail company was unable to correct errors or
explain confusing system output. Fraud increased. Business and profits declined, and customers suffered much anguish and personal expense. The project leader was blamed for the losses.

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Pause, deliberate. Is there an ethics issue involved? Were the actions of the project leader or management unethical or not unethical? What general principles apply? Record your responses on the form in Part IV. (Panel responses are given in Part V.)

Scenario 5.4

PROGRAMMING MANAGER, COMPANY: DEVELOPING PROGRAMS WITHOUT ADEQUATE CONTROLS

A programming manager received a directive to develop a set of programs that would circumvent the normal accounting controls in his employer’s business. It was explained to him that the purpose was only to test new business functions. He protested to his senior manager, but was told that the dangers of circumventing the controls had been assessed, and a decision had been made to proceed as planned. The manager implemented the programs.

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Pause, deliberate. Is there an ethics issue involved? Were the programming manager’s actions unethical or not unethical? What general principles apply? Record your responses on the form in Part IV. (Panel responses are given in Part V.)

Scenario 5.5

CONSULTANT, COMPUTERIZATION OF A GOVERNMENT DEPARTMENT: DISREGARDING IMPACT ON EMPLOYEES

A consultant has a government client which is embarked on a large scale computerization of one of its service departments. It is clear that a very large number of jobs will vanish, and the job content of many others will be changed.

The union of public employees is pressing to have a voice in the system design, but the government has taken the position that all aspects of the new system fall within the rights and responsibilities of management to conduct its operations in an efficient manner, and are therefore not subject to union negotiation. The consultant accepts the view of the management and refrains from any discussion of job levels, job content, or quality of working life in his design study.

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Pause, deliberate. Is there an ethics issue involved? Were the consultant’s actions unethical or not unethical? What general principles apply? Record your responses on the form in Part IV. (Panel responses are given in Part V.)

Scenario 6.3

CONSULTANT, PROGRAMMER, A PROJECTED NUCLEAR ENERGY PLANT: SELECTING FAVORABLE COMPUTER OUTPUT IN A FEASIBILITY STUDY

A consultant specialized in feasibility studies for nuclear energy plants. He was under contract to a utility company to compare a new breeder type plant with fossil fuel alternatives. His computer projections showed the nuclear plant to be marginally feasible, perhaps dangerous, and far less efficient than a plant using fossil fuels. Because of his dependence on utility company business and his desire to protect his reputation, he decided to use only that part of the computer output that he regarded as most useful, and, in the process, made the projections look much more favorable for the nuclear plant. A programmer working for the consultant knew about the change and protested to him about “falsification of the results of the study.” When the consultant defended the course of action taken, the programmer went to his congressman with the story.

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Pause, deliberate. Is there an ethics issue involved? Were the actions of the consultant and the programmer unethical or not unethical? What general principles apply? Record your responses on the form in Part IV. (Panel responses are given in Part V.)

Scenario 6.5

RESEARCHER, PREDICTIONS BY COMPUTER MODELING: SHAPING PUBLIC OPINION

At a time when experts were beginning to question the merits of current agricultural practices, a researcher used computer modeling techniques to predict that a global agricultural disaster would occur in fifty years. To stimulate public concern and debate about agricultural practices, he published his prediction in a low-priced, mass-market paperback. The book emphasized the role of the computer in making this prediction, for example, by including computer-generated graphs as illustrations. But the book did not discuss the fact that the prediction depended on debatable assumptions and selection of data, and could be radically different with a slight change of assumptions. Being unaware of these facts, the general public accepted the dramatic prediction as indisputable and objective, in significant part because it came from a computer, and the public became deeply concerned with agricultural practices.

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Pause, deliberate. Is there an ethics issue involved? Were the researcher’s actions unethical or not unethical? What general principles apply? Record your responses on the form in Part IV. (Panel responses are given in Part V.)
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Your participation is solicited. To save space, only one page of the Reader Scenario Analysis Form is printed here (page 188). Please complete and return a questionnaire for each scenario. Use reproductions of the form as necessary.

A summary of the responses will appear later in the Communications of the ACM. Please respond whether or not you agree with the panel opinions. If those who agree fail to respond, erroneous statistical conclusions may be made.

The Committee would appreciate it if you key each response to the appropriate sections of the ACM Code of Professional Conduct (Part II).

Thank you for your participation.

Part V. Panel Responses to Scenarios

Scenario 1.8

PROFESSOR, UNIVERSITY: NOT GIVING CREDIT FOR ASSISTANCE

Party, Professor: Producing a Scientific Paper Without Acknowledgments

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Opinions

Although the professor had the original idea and wrote the final paper, his work could not have been acceptable from a scientific point of view without the work contributed by the students and the computer programmer. He violated principles of fairness and was unethical in taking full credit for the work. Those who make significant contributions to a project deserve credit, even though they may be working for the project leader.

While it is common practice for professors to use students' research in preparation of scientific papers, in this case the material contribution was sufficient to warrant explicit credit. However, a difficult problem is raised in applying the concept of property and associated ethics to ideas, theories, arguments, proofs, and computer programs.

The opinion was also advanced that the professor was not unethical. The three contributors were all working for him. However, he might find it difficult to get work done for him in the future.

General Principles

Plagiarism may be the highest form of flattery, but it is a low form of thievery. The difference between plagiarism and the scientific method is acknowledgment. A scientific worker should honestly acknowledge the work of others. It is the heart of the research payoff to encourage the good work of students by acknowledgment.

Scenario 1.9

PROGRAMMER, TIME-SHARING SERVICES: INФILTRATING A RIVAL COMPANY'S COMPUTER SERVICE

Party, Programmer: Compromising and Gathering Intelligence on a Competitor's Time-Sharing Service

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Opinions

The programmer was not simply testing a competitor's product, but was gaining sensitive information, gaining services for which he was not paying, identifying other users, and generally trying to cause harm to the service, all of which actions are questionable on moral grounds. Even if they can be viewed as accepted business practices, they are not justified from a moral point of view, for there could be no credible explanation for this behavior except to wish to cause harm to a competitor and take advantage of his weaknesses. It is reasonable to believe that the company employing this programmer would not easily accept similar treatment from a competitor.

Testing programs for which there is a charge without paying the charge was nothing less than stealing. Gaining privileged access available only to company employees was another form of stealing. Attempting to identify customers and ascertain their billings was certainly an invasion of the company's privacy. The programmer's attempt to harm the system was clearly illegal. Paying airfare on an airplane does not authorize a person to rip the seats or tear up the navigational charts. Sabotage cannot be condoned.

In view of newspaper accounts of international business intrigue, it is understandable that a programmer might consider his actions as accepted business intelligence activities.

One participant reasoned that if "manufacturing" a system is like manufacturing a car, then the behavior of the programmer was morally acceptable. However, if the development and use of a system is like the development and use of one's own body, then access to the system could be morally warranted only with the owner's consent. The latter appears to be more the case than the former.

Other participants were more decided in their opinion that the reverse engineering analogy was fallacious, expressing views that overlapped and sometimes differed in emphasis.

Attempting to crash a system, unless authorized as a testing activity, is at least mischief, if not sabotage. The analogy is false. The equivalent would be to read a computer program without making a copy to see how it works, then to write one's own version. The car business equivalent of what the programmer did would be industrial spying, using such means as telephone bugs and infrared cameras to steal trade secrets without breaking into the plant. The argument by analogy is lame. The programmer did not buy the software from the service. He bought computer time and the right to use the system and utility programs. As for looking at users' files, that was clearly a violation of trust, and trying to crash the system is comparable to interfering with a vital business function, such as telephone operation.

If a trade secret law does not cover this kind of activity, it will. A person who exploits the slowness of the law in responding to new technology may stay out of jail, but his actions are unethical.

The programmer was trying to harm his company's competitor in ways which go well beyond accepted forms of competition. His attempted justification will not do: The fact that an activity is not explicitly forbidden does not justify nor permit that activity. Things which are obviously illegal or
wrong do not need to be expressly prohibited. He could not be serious in thinking that as long as he paid his user charge he could do just anything to the computer. When GM buys a Ford to see how it is made, it does not at the same time attempt to crash Ford's assembly line. There is great difference between trying to find out what a competitor is doing, especially by such innocuous means as buying its product on the open market to evaluate it, and trying to disrupt its production. Perhaps this is the difference between intelligence gathering and sabotage.

The competing company should have stipulated allowable or prohibited uses of its services in the contract, and at least spot-checked on the actual use being made of its system. On the other hand, there is such a thing as generally accepted probity. You do not have to promise to be honest in a contract. It is understood that you will be. This was a clear violation, or attempted violation, of trade secret principles.

The only opinion exonerating the programmer was this: If his place of work was clearly shown on the contract, there was no unethical action. If he hid crucial facts (e.g., used only his home address) his actions were unethical.

General Principles

Implicit in any contract are the ethical principles generally accepted in the community.

A computer time-sharing user should not maliciously or recklessly injure or attempt to injure, directly or indirectly, the professional reputation, prospects, or business of others. You do not have to build a fence around your property to expect others to respect it.

Scenario 2.5

PROGRAMMER, BUSINESS ENTERPRISE: SELLING A PROGRAM NO LONGER USED

Party, Programmer: Selling the Use of His Employer's Computer Program

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Opinions

There was unanimous agreement that the company's not wanting to market the program or any other product did not give the programmer the right to market it for his own benefit. Rationalizing that the program was no longer used did not change the ethics of his act. Under the circumstances, it would appear that the programmer could have negotiated some arrangement with the company that would have been ethical.

A majority agreed that since the scenario does not make clear the positions of the participants regarding ownership of the program, differing conclusions could be reached. If the programmer had been led to believe the program was available for his personal use, then his marketing action was not unethical. If there was any question about the employer's ownership of the program, then the ethical course for the programmer would be to explain his plans openly and settle the issue through negotiation.

If the programmer had permission to take the program or took only his knowledge and did not use company resources to develop his business, his actions were ethical, as well as common in the business world.

Discussion divided equally on the following opinion: If the program was not considered proprietary by the employer, then the programmer's not telling his employer of his activities was not unethical. One side mentioned that he perceived a use for the program which his employer did not express an interest in pursuing. There was nothing wrong with being prudent in trying to maintain his present employment while discovering whether or not marketing the program was profitable. He had no obligation to inform his employer of his activities. His actions could not directly harm his employer. The other side felt that, even though the program was scrapped and the employer did not want the business, the firm probably did not want him marketing on the side, especially using the firm's name. He should have resigned and taken his chances.

Only one individual believed that the programmer was free to use the program as he saw fit.

Party, Programmer: Moonlighting to Start a New Business

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Opinions

A majority agreed that if the programmer could perform his assigned duties competently, and the employer had no expressed policy against moonlighting, he could do as he wished with his own time, assuming there was no agreement between him and his employer about side businesses. It might be different if he were in a managerial position. In contrast, there was mixed reaction to moonlighting in competition with his employer. Certainly such moonlighting without his employer's knowledge violated usual understandings about the nature of full time, salaried employment, and commitments by both the employer and employee.

General Principles

Programmers do not have a property right in programs written for others in the absence of any agreement otherwise. An employer has a right to expect no conflict of interest in the outside activities of an employee.

An owner's dormancy of interest in his property does not justify appropriation of the property by another party.

Moonlighting is justified, but there should be a primary loyalty to the employer in case of conflict.

It is not unethical to moonlight in absence of an agreement not to do so, and when the moonlighting does not detract from employment obligations.

Full time employment implies collateral commitments by both parties, including the employer's intention to provide continuing employment and intangible support, as well as each party's commitment to tangible support of the other. The obligation is implied rather than expressed.

In the absence of a clear idea about ownership of programs, it could at least be advocated that when a programmer takes a job, a written agreement be made between a programmer and his employer about program ownership.

The First Amendment of the Constitution and the spirit of free enterprise encourage employees in the use of their skills, so long as the fruits of another's efforts are not adversely affected.
PROGRAMMER, PERSONAL PROGRAM: TAKING THE PROGRAM TO HIS NEW POSITION

Party, Programmer: Taking the Only Copy of His Program with Him to a New Position

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Opinions

Almost all agreed that the first employer acquired some interest in the program when his resources were used for its development. At least, the programmer should have obtained permission from the first employer and left a copy of the program behind.

Most participants argued that the program had value only when used by the programmer. The former employer received the benefit when the programmer worked for him. This was not a company program; the programmer wrote it for his own use. No one else used it and, in all probability, no one would want to use it or know how to. The program was an aid for the programmer alone. When he changed jobs, he took his tools with him.

Some participants thought that since the programmer used his own time to develop the program, and even though he used his employer's facilities, on balance the employer benefited. If it enhanced the programmer's performance at the new company, it did so at the old company as well. These participants felt the program could be seen as a material instance of the programmer's professional development. In working for his employer he gained personal experience and, if by reason of this experience, he could get and perform better jobs, then he had enhanced his development by this experience.

In determining that this was not an unethical act, some participants gave great weight to the fact that he developed a programming tool on his own time. His using the employer's facilities on a weekend might raise an ethical question. However, in this instance the employer benefited directly from the programmer's efforts. It was not incumbent upon the programmer to turn his efforts over to the company so that all programmers' work would be improved. Improving his own performance did not carry the responsibility or moral obligation to improve that of others in the company.

Some participants definitely concluded that the programmer was at fault in making unauthorized use of resources to develop the program. Since he was expected to use his best skills in performing his job, he had a duty to obtain his employer's support to develop the best tools for his work.

Some participants stated that the employer should have protected his programs more effectively. The new employer should not have hidden his head in the sand and should have questioned the source of the program.

Participants split evenly between agreement and disagreement with the statement that the program could be regarded as a tool developed in part with the employer's resources. If it is so regarded, in the absence of provisions in the employment contract governing such a situation, the program probably belonged to the employee.

Opinion also split evenly on whether the programmer should have obtained his old employer's consent to the intended use of the program in his new position. Use without knowledge of the true owner constitutes theft. Full disclosure and informed agreement should have preceded the use of the program anywhere except in the first employer's service.

The majority of participants took the position that nothing in the case altered the fact that a program, the property of one company, was taken and used to benefit a competitor.

Most disagreed with the observation that "as long as the programmer uses his program for his own work and does not sell it, there is nothing wrong with his action."

General Principles

Items developed with company resources belong, at least partly, to the company.

A programmer possesses the tools of his trade.

Current use of a product owned in whole or in part by one's employer should not be the sole criterion for determining who has the right to it.

SCIENTIST, PROGRAMMER, FILES OF PERSONAL DATA: MAKING NEW USE OF DATA WITHOUT SUBJECTS' PERMISSION

First Party, Scientist: Merging Files without Permission of Subjects

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Second Party, Programmer: Performing Requested Merging of Files

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Opinions

A majority of participants felt that the scientist's action was a borderline case in terms of ethics. It could be said dogmatically that he was unethical because he did not have informed consent of the subjects. Nor did he ascertain, by consulting researchers in charge of the original studies, whether the combining of the two subject populations would possibly render the new research invalid. On the other hand, while the principle of informed consent is important, there is a practical limit to its application, and it is doubtful that the scientist's action was unethical. There should be no restrictions on use and dissemination of data unless individuals can be identified. When data are collected about identifiable individuals, as in this case, questions of informed consent must be addressed, but they cannot be answered by any large generalizations. It would be a mistake to impose a general restriction on the use of personal information. A problem should be identified before restriction of use is imposed.

Informed consent is important, but where the expense of obtaining it was prohibitive, an independent committee should have been consulted to weigh the benefits of the research against the costs, i.e., the invasion of privacy which seems to be inherent. To take an independent action, presumably with-
out even checking with those who collected the data, would appear to be unethical.

The participants were split over whether the programmer was unethical. Some felt that he should not have performed his services, using the files without the consent of the researchers who owned them, that is, those who obtained consent from the subjects for the original research.

General Principles
A programmer or systems analyst should always seek direct and positive authorization for the use of data fields from whomever he identifies, in his best effort, as the custodian of the files.

Scenario 3.5
PROGRAMMER, EMPLOYER, GOVERNMENT, PERSONAL DATA: USING GOVERNMENT-OWNED PERSONAL DATA FOR BUSINESS PURPOSES

First Party, Programmer: Complying with the Employer's Request to Supply Personal Data
Total Unethical Not Unethical No Ethics Issue
31 31 0 0

Second Party, Employer: Requesting Personal Data from a Government Study
Total Unethical Not Unethical No Ethics Issue
25 24 1 0

Third Party, State Government: Not Providing Sufficient Protection for Personal Data
Total Unethical Not Unethical No Ethics Issue
13 13 0 0

Opinions
All participants agreed that, although using personal information without the consent of the subjects may be common practice, it is not, thereby, ethical. All but one agreed that the employer was unethical to act coercively in requesting the data. The employee as a contractor had a duty to protect the data and was unethical. Most participants agreed that even though there was no explicit government restriction—in fact, even with the government's permission—it was unethical to comply, since the programmer should not have agreed to supply such personal information for business purposes without the informed consent of the individuals.

It was unanimously agreed that the government was unethical in not providing more adequate protection for the personal data.

General Principles
Common practice does not make an act ethical. Some kinds of personal information by their very nature must be handled confidentially, independent of specific confidentiality agreements or lack thereof.

Scenario 4.3
SYSTEMS ANALYST, SOFTWARE COMPANY: DESIGNING A COMPUTER SYSTEM TO REPLACE A CUSTOMER'S EMPLOYEES

Party, Systems Analyst: Developing a Computer System Application to Replace as Many Workers as Possible
Total Unethical Not Unethical No Ethics Issue
27 4 21 2

Opinions
All agreed that the systems analyst was not unethical in fulfilling the contract. A purpose of computer technology in automation is to replace people, where replacement is practical and cost-effective. However, the systems analyst has a responsibility when opportunity arises to do what he can to assure fair treatment for people affected by his work.

The group also agreed that the brother-in-law was not unethical in bringing the situation to that analyst's attention.

Finally, all but one participant agreed that the customer company, when introducing productivity improvements, has a social responsibility to minimize the impact on the replaced employees.

General Principles
Employers introducing productivity improvements have a social responsibility to minimize the impact on replaced or displaced employees.

Scenario 4.4
PROJECT LEADER, MANAGEMENT, RETAIL COMPANY: INSTALLING AN INADEQUATE SYSTEM

First Party, Project Leader: Implementing and Putting Into Production an Incomplete and Inadequate System
Total Unethical Not Unethical No Ethics Issue
31 9 14 8

Opinions
The participants were split on all the opinions given. There was significant agreement on none of them. One participant stated that the scenario is not clear enough about the assignment of responsibility to permit a judgment on ethics.

Some participants saw this as a clear case of a professional computer person's allowing a bad system to be used. He continued development even though he knew the system would be inadequate.

Some thought that the project leader should not have been held responsible, because he did warn management of impending problems and was told they would be corrected later. Having warned management of the problems that might result...
from their decision, he acted ethically and had no further responsibility for that decision. He merely followed orders. Some maintained that this was a matter of poor judgment in several respects. The project leader who developed the system with so few checks and so little flexibility was apparently not competent to judge what was minimally essential. He should have known enough, and documented his complaint. Finally, he should have resigned when no corrective action was taken. By not doing so, for whatever reasons, he was in part morally responsible for the damage that resulted. He deserved blame.

The project leader was not practicing in the best interest of his employer or the public. Every business student learns early how vital the billing process is to a company. As the expert, he was responsible for establishing the overall effectiveness of the system and should not have allowed himself to be compromised. Without error detection and audit controls, the system could not be said to be complete. By letting it go into production, he implied it was complete. He was not ethical, because he did not resign. Other participants, however, suggested that the project leader only allowed himself to be bullied into doing bad work. That was unwise and incompetent, but not unethical.

Second Party, Management: Ordering the System into Production Prematurely and Blaming the Project Leader

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Opinions

It was almost unanimously agreed that management should have provided staff and funds for a sound and complete system. It should have taken the blame for failure, and it was unethical to make a scapegoat of the project leader.

At best, the managers were culpably ignorant of the possible consequences of an incomplete system. If they did not trust the judgment of their own expert, they should have asked for an outside consultant’s advice. Managers learn early how susceptible a system is to negative factors, and how devastating even minor perturbations can be. Management’s action was a dereliction of responsibility to the stockholders, customers, and employees by knowingly allowing bad work and blaming the project leader for the results. These actions were unethical.

General Principles

Persons in responsible positions, whose decisions affect other people in significant ways, have an obligation to base their decisions on all relevant, reasonably available information and are morally responsible for foreseeable consequences of their actions.

When a professional person is given only partial authority or inadequate resources to perform his work and bad consequences result, he cannot be held responsible for factors outside his control.

The accountability standards developed for accountants should be used as a model for certifying computer technologists.

Scenario 5.4

PROGRAMMING MANAGER, COMPANY: DEVELOPING PROGRAMS WITHOUT ADEQUATE CONTROLS

Party, Programming Manager: Implementing Programs that Circumvented Accounting Controls

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Opinions

The participants unanimously agreed that the senior manager made a decision that involved no ethical issues, and the programming manager acted ethically in warning the senior manager. If the programming manager did not believe that his senior’s judgment was correct and competent, then he should have taken positive action against the decision.

All but one participant agreed that if the programs were ultimately to be used for real business functions, then the manager was obligated to make sure there were adequate controls to protect the business against loss. Also, if the two managers could not agree, then it was necessary either that they call for independent arbitration, or that the programming manager resign to remain ethical.

General Principles

An individual responsible for business computer programs is also responsible for assuring there are adequate controls to protect the business against loss.

Scenario 5.5

CONSULTANT, COMPUTERIZATION OF A GOVERNMENT DEPARTMENT: DISREGARDING IMPACT ON EMPLOYEES

Party, Consultant: Accepting His Client’s Views and Refraining From Considering Adverse Effects on Employees

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Opinions

All but one participant agreed that, if the consultant disagreed with his client’s position with respect to work force reduction, he should not accept the assignment and should attempt to advance his views through social and political processes.

A great majority supported the opinion that the consultant had an ethical responsibility to communicate to his client his concerns about wider implications, independent of union or government views. He could communicate his views in an attachment to the product, and he should not bill the client for communications March 1982 of the ACM Number 3
the extra effort. The consultant was unethical to go along with management's views and limit his study.

A smaller majority agreed that the consultant's obligation was to design an efficient operation for the government department. It was not part of his professional obligation to give advice on whether there should be more or fewer government jobs. If the consultant had a personal opinion about job reduction and if he believed his professional advice would lead to consequences he would not approve of, he should not have accepted the job. By the same vote, an additional point was supported: The job levels, job content, and quality of working life have an impact on the degree to which his system will be accepted and successful. Therefore, the consultant would be unethical in not discussing these factors with management if he was aware of them.

Most agreed with, but a few rejected, the statement that this scenario required distinguishing between legal and ethical obligations in the following way. It is not expected that a consultant should be legally required to go beyond the terms of reference of scope of his study. It is reasonable that ethical considerations will always make him take human factors into account, even at the expense of operating efficiency.

In the same statement, it was expressed that management had taken the position that it had unilateral responsibility for human factors. If the consultant viewed this as wrong because, among other reasons, the operation would be affected, he was ethically obligated to raise the larger issues. By not doing so, he was acting unethically.

The group was evenly split between rejecting and agreeing with the notion that management was at fault for ignoring important aspects of the problem and, especially, the impact of the reorganization on the working conditions of employees. In any case, union or management prerogatives are a legal, not a professional, matter and represent a "red herring" in this scenario. The social judgment with respect to the size of the government work force is not an ethical issue in the computer profession. Nevertheless, several participants pursued the issue of the government's policy in this instance saying that to refrain from taking job levels and content and quality of working life into account was to place a higher value on efficiency than on human needs. This sacrifices human values and violates the government's mandate and moral priorities to protect the interests of its citizens. In making no objections, the consultant helped promote and legitimize a morally untenable policy.

Finally, only a small minority supported a statement about the union and the consultant: The consultant would have been unethical to include any of the concerns of the union, because he should not use his special position to unduly influence socially derived policies. The employees make their bargain through the union in a socially approved and public process that best serves the public, and the consultant should not interfere or be involved with that process.

General Principles

All parties involved in design, assessment, and implementation of computer systems should always consider human consequences, not in the sense of serving special social or political interests in particular cases, but to develop habits of addressing classes of human problems that are exemplified in particular cases, e.g., job losses, dehumanization of work, or physical danger.

While it is agreed that an increased level of sensitivity to wider implications of technical endeavor is needed, it is also important to recognize the practical negative consequences of suppressing concern and of inaction.
lisher's role. One individual stated that he had an ethical obligation to distinguish opinion from fact and should not have published the book. Another said he had no ethical obligation to check the validity of the material. Several participants agreed that the publisher had an obligation not to publish knowingly fraudulent material.

General Principles

The computer should never be presented as an active agent. The basis for credibility of a computer-related product should be validity of the data and methods used and the inclusion of data and methods, along with the results, in the publication.

Part VI. Reference and Bibliography

Reference


Bibliography

Books, papers, and reports relating to professionalism and ethics in computing, technology, and engineering.


Epilogue

Now that you have reviewed this self-assessment procedure, have compared your responses to those of the panel, and have filled out and mailed in copies of Part IV, you should ask yourself whether this has been a successful educational experience. The Committee suggests that you conclude that it has only if you have:

—discovered some concepts that you did not previously know about or understand,
or
—increased your understanding of those concepts which were relevant to your work or valuable to you,
or
—turned your mind to a consideration of ethics.