

Rules of Ethics in Information Processing

By Donn B. Parker

The background and motivation for the adoption by the ACM Council on November 11, 1966, of a set of Guidelines for Professional Conduct in Information Processing are described. A brief history is given of ethical codes in other professions. Some reasons for and against adoption of ethical rules are considered, and several sections of the ACM Guidelines are analyzed. The purpose is to inform about this important aspect of our profession, as well as to stimulate thought and interest.

KEY WORDS AND PHRASES: ethics, professional conduct, code of ethics, ACM guidelines, professionalism, professional societies, unethical conduct

CR CATEGORIES: 1.3, 2.2

There are a number of serious ethical problems in the arts and sciences of information processing. A few of these are: invasion of privacy by use of the computer; implications of copyrighting computer programs; and fraudulent programming trade schools. The "little" problems of personal ethics are of equal importance and are often closely related to the more imposing problems. We can do a great deal about ethical problems if we just give the some serious attention.

It is difficult to discuss ethics in our field without considering professionalism. A definition of a profession together with an expansion of it for purposes of this discussion, is as follows: A profession is a field of endeavor requiring a high level of education, skill, and intelligence in an area affecting society^[1]. A profession receives a trust from society and in return is responsible to society to perform at a high level in an ethical manner. Specific definition of ethical rules is based on the existence of a profession within which the rules apply.

Significant factors demonstrate that there is an emerging profession in the arts and sciences of information processing. Specific academic curricula for colleges and universities are being developed in the field, and departments of computer science are becoming common. The Data Processing Management Association has developed the Certificate in Data Processing, which recognizes certain levels of knowledge attainment and will, by 1972, require a bachelor level degree^[2]. Many companies have been formed which are exclusively devoted to the field, and the US Government has become increasingly concerned

with many aspects of computers and their use. We find a gradual, exclusive identification with professional societies in our field. There is an increasing distinction between professional and sub-professional work. However, this last point is probably the least apparent at this stage in the development of our profession.

Several problems are associated with the emergence of this profession. One, for example, is that it does not even have a name. Another problem is the rapid development of our technology, for which other professions have developed over hundreds of years in much slower moving environments, our development is measured in less than tens of years. The diverse backgrounds of people in the field and the diverse applications of computers in other professions are also significant problems in an effort to unify.

Segments of other professions are organized into professional societies. Likewise, societies in our profession should define, represent, and bring order to this emerging profession. These include the Association for Computing Machinery (ACM), Data Processing Management Association (DPMA), Institute of Electronic Engineers (IEEE) Computer Group, American Society for Information Science (ASIS), the Simulation Council Incorporated (SCI), and the Society for Information Display (SID). These societies are already communicating technology, motivating students to enter the field, developing curricula, engaging in professional development, influencing legislation through individual members, setting membership requirements, and giving awards and recognition to members for outstanding performance.

One thing our societies have neglected is to define and enforce a general code of ethics. Other societies have a wide range of experience with ethics. The

American Society of Civil Engineers is an old society established in 1852, but it did not establish a code of ethics until 1914. This society considers hundreds of ethical problems every year. Between the years 1951 and 1964, 78 of these problems became formal cases^[3]; 48 of them were dismissed. Of the remaining 30 cases, some involving more than one member, 16 members were admonished, 18 suspended, and 8 expelled. One third of the 78 cases concerned unethical competitive bidding; one fourth concerned derogatory actions to the integrity, dignity, and honor of the profession; one twelfth involved supplanting another engineer in an engagement; and the remainder represented a variety of other charges.

The IEEE has not established a code of ethics, although it is considering that one be proposed. However, since IEEE is a scientific, educational and "literary" organization, and its constitution so states, the question of a code of ethics would appear to be out of consonance with the main purposes for which it is organized and operated^[4]. All the organizations in the information processing field mentioned above are also committed to similar purposes.

THE DPMA established a code of ethics when it was chartered in 1951. However, the code is specialized for DPMA members, and it is administered in a variety of ways at chapter levels. There is no national mechanism for enforcement. The Certificate in Data Processing program requires that a candidate must have his good character certified by a CDP holder^[5]. It states that "candidates must be of high moral qualifications and professional attitude," but these concepts are not specifically defined. Also, "if derogatory information is discovered, DPMA will investigate further." Investigations have resulted in a few applicants' being turned away; no certificates have been revoked.

ACM set minimum professional-type requirements for membership in July 1966. Two members must attest that an applicant has "attained professional stature by demonstrating intellectual competence and ethical conduct in the arts and sciences of information processing"^[6]. However, ethical conduct was not defined. This left a void until on November 11, 1966, the ACM Council adopted a set of guidelines called "*Professional Conduct in Information Processing*" (see full text reprinted herewith). Using the term guidelines the Council wisely avoided the implication that the rules constitute a code to be enforced. ACM does not yet feel prepared to generally enforce such a code. The set of

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Professional Conduct in Information Processing

INTRODUCTION

This set of guidelines was adopted by the Council of the Association for Computing Machinery on November 11, 1966 in the spirit of providing a guide to the members of the Association. In the years to come this set of guidelines is expected to evolve into an effective means of preserving a high level of ethical conduct. In the meantime it is planned that ACM members will use these guidelines in their own professional lives. They are urged to refer ethical problems to the proper ACM authorities as specified in the Constitution and Bylaws to receive further guidance and in turn assist in the evolution of the set of guidelines.

PREAMBLE

The professional person, to uphold and advance the honor, dignity and effectiveness of the profession in the arts and sciences of information processing, and in keeping with high standards of competence and ethical conduct: Will be honest, forthright and impartial; will serve with loyalty his employer, clients and the public; will strive to increase the competence and prestige of the profession; will use his special knowledge and skill for the advancement of human welfare.

1. *Relations with the Public*

- 1.1 An ACM member will have proper regard for the health, privacy, safety and general welfare of the public in the performance of his professional duties.
- 1.2 He will endeavor to extend public knowledge, understanding and appreciation of computing machines and information processing and achievements in their application, and will oppose any untrue, inaccurate or exaggerated statement or claims.
- 1.3 He will express an opinion on a subject within his competence only when it is founded on adequate knowledge and honest conviction, and will properly qualify himself when expressing an opinion outside of his professional field.
- 1.4 He will preface any partisan statement, criticisms or arguments that he may issue concerning information processing by clearly indicating on whose behalf they are made.

2. *Relations with Employers and Clients*

- 2.1 An ACM member will act in professional matters as a faithful agent or trustee for each employer or client and will not disclose private information belonging to any present or former employer or client without his consent.
- 2.2 He will indicate to his employer or client the consequences to be expected if his professional judgment is over-ruled.
- 2.3 He will undertake only those professional assignments for which he is qualified and which the state of the art supports.
- 2.4 He is responsible to his employer or client to meet specifications to which he is committed in tasks he performs and products he produces, and to design and develop systems that adequately perform their function and satisfy his employer's or client's operational needs.

3. *Relations with Other Professionals*

- 3.1 An ACM member will take care that credit for work is given to those to whom credit is properly due.
- 3.2 He will endeavor to provide opportunity and encouragement for the professional development and advancement of professionals or those aspiring to become professionals with whom he comes in contact.
- 3.3 He will not injure maliciously the professional reputation or practice of another person and will conduct professional competition on a high plane. If he has proof that another person has been unethical, illegal or unfair in his professional practice concerning information processing, he should so advise the proper authority.
- 3.4 He will cooperate in advancing information processing by interchanging information and experience with other professionals and students and by contributing to public communications media and to the efforts of professional and scientific societies and schools.

guidelines was adapted from the Engineering Council for Professional Development Short Form Canons of Ethics of 1967^[7].

A brief history, as well as the basis for codes of ethics, is quoted below from the book *Ethics and Professionalism in Engineering*¹ by Murray I. Mantell, Chairman, Department of Civil Engineering, University of Miami^[8].

Probably the most ancient and well-known written statement of professional ethics is the *Hippocratic Oath* of the medical profession. Suggestions related to the *Oath* date back to Egyptian papyri of 2000 B.C. The Greek medical writings making up the *Hippocratic Collection* were put together about 400 B.C. The present form of the *Hippocratic Oath* originated about 300 A.D. Most of the major professional organizations in the United States were founded during a relatively short period in the latter half of the nineteenth century; and most of them adopted the present form of their codes of ethics during a relatively short period at the beginning of the twentieth century. The American Medical Association, founded in 1847, adopted its *Principles of Medical Ethics* in 1912. The American Society of Mechanical Engineers, founded in 1880, adopted its *Code of Ethics* in 1914. The Institute of Electrical and Electronic Engineers (originally the American Institute of Electrical Engineers),² founded in 1884, adopted its *Code of Principles of Professional Conduct* in 1912. The American Institute of Architects, founded in 1857, adopted its *Principles of Professional Practice and the Canons of Ethics* in 1908.

The adoption of the comprehensive *Principles of Medical Ethics* appear to have followed closely behind the efforts in 1910 of the American Medical Association to establish standards and classifications for medical schools. Whereas laws to regulate the practice of medicine were established as early as 1639, most of the other professions were not regulated to any appreciable extent until the early part of the twentieth century. After the Civil War there was a greatly increased feeling that it was undemocratic and un-American to grant special privilege to the professions, particularly the legal profession. A number of states passed statutes upholding the right of every voter of good moral character to practice law. This attitude appears to have resulted in a rising tide of irresponsibility and commercialism; and a consequent reaction to establish standards of character, education and experience started at the turn of the twentieth century. These standards were promoted as states, one after the other, began to pass registration laws controlling the practices of engineering, architecture, law, and the other professions, and the various national professional organizations adopted their codes of ethics.

Professional activities cannot be based upon the major common law premise used in ordinary business relations *caveat emptor* "let the buyer beware."

A written code of ethics declares before all the world the high standards which are professed and gives an understanding of what the public may expect in their relations with members of the profession. The code also is a helpful guide to the members of the profession in informing them what is expected of each member and what they may expect of each other. The public has come to expect competence, trustworthiness, and expeditious action; and the unethical actions of a few can arouse public indignation which may condemn and punish a profession at large through excessive legislation or boycott. The promotion of and adherence to ethical ideals brings the mutual gain of building respect for oneself by building respect for the profession.

A code of ethics is a set of local rules which represents the sum total evaluation (not merely appraisal) by a group of individuals of wide experience, of past practices and problems which are commonly encountered in the profession. *The Canons of Ethics for Engineers* published in 1947 by the Engineer's Council for Professional Development, have been adopted by most engineering societies and are used as standards of ethical practices by a number of state registration boards. However, many of the engineering societies have also retained their own codes of ethics, primarily because of problems believed unique to that branch of engineering.

The status and history of establishing rules of ethics have been described; now motivation deserves some attention. We all transgress ethical conduct by most definitions to some degree just by our human nature. Sooner or later some body or some group is bound to do something drastic and bring nationwide attention and disgrace to our profession. We are sitting on the proverbial powder keg. The public, the press, and the Government are primed and ready for something to happen. The press is creating a fear of computers through their personification with such headlines as "Meet the Monster that Checks Your Taxes." The "monsters" thus created must now do something terrible to justify this analogy.

Senator Sam J. Irvin of North Carolina, who is chairman of the Subcommittee on Constitutional Rights, was quoted in the March 13, 1967 issue of *Electronic News* as saying that thought should be given to a professional ethics code for the industry "... for those who arrange and operate the computer's processes. If self-regulation and self-restraint are not exercised by all concerned with automatic data processing, public concern will soon reach the stage where strict legislative controls will be enacted, Government appropriations for research and development will be denied, and the computer will become the villain of our society." Senator Irvin was promptly informed of the action taken by ACM in adopting the Guidelines. He replied in part as follows: "It is heartening to

me that your association is concerned enough about the potential invasions of privacy occasioned by the indiscriminate use of computers that you would adopt voluntarily a Guideline for Professional Conduct in Information Processing"

On January 10, 1967, the US Department of Justice completed the prosecution of the first federal case involving the criminal use of a computer^[10]. 23-year-old programmer worked for a company which had a contract to provide data processing services for the National City Bank of Minneapolis. The young man programmed and operated NCB Program 107, which processed the bank's checking accounts. He also had his checking account with the bank. In June 1966 he found that he would be in financial difficulty that would make his account overdrawn for several days by \$334. He put a "temporary" patch in the program for exception reports which caused it to ignore his account checking for overdrafts. The daily printings showed the overdrawn condition but exception reports were relied upon. By September 1966 his account was overdrawn by \$1357, and the patch was still in the program; but the computer failed one day and manual processing led to the discovery of his activity. The FBI was called in. The young man immediately admitted his guilt and made restitution to the bank. However, because indictment is mandatory in such cases, he was charged with two counts of making false entries in bank records with maximum penalties of \$5000 a year or five years in prison. On January 1967, he received a suspended sentence and two years' probation. He was a member of a professional society, though he had taken the CDP examination twice. Although the publicity of this incident was local, it did appear in headlines on the front page of the *Minneapolis Tribune*. It is certain that more incidents of this type and of more serious nature will occur with the proliferation of computer usage in increasingly important roles in society.

The status of ethical codes and some of the motivation have been described. An analysis of the adequacy of the ACM Guidelines is in order. We will work with and create logical machines that tend to look with scorn on redundancy, vagueness, and subjective measurement. However, in ethical rules we are dealing with logical machines and scientific truth. We are engaged in philosophy and in dealing with people. A code of ethics must be considered in this light.

A review of the set of Guidelines will show some of its strengths and weaknesses. The preamble and first part of Section 1 state that a member is to serve "with loyalty his employer, client

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²The IEEE was formed as a merger of the AIEE and IRE, and the code was dropped at the time of merger.

and public." It is easy to think of situations where this leads to conflicting loyalties and seems impossible to follow. Impossible or not, it is the effort to comply and the awareness of possible conflicts which count. Too many of us can become so buried in the technical details of our work that we miss their implications on our environment. This responsibility must be an additional burden on the professional person.

The Guidelines also state that an ACM member "will use his special knowledge and skill for the advancement of human welfare." Consider the use of computers to increase effectiveness of waging war, of killing people. This is not a bizarre problem. The biologists working on methods of bacteriological warfare have a code of ethics also. Some of us feel that human welfare is dependent upon our country's having the ever improving capacity to wage war more effectively against our immoral enemies. Others feel that human welfare is an absolute concept precluding the development and use of methods which kill people. Both sides can base their position on that same quote from the Guidelines.

ACM is not capable of deciding this issue and should not try. ACM must limit itself to its area of competence in this matter by informing the Government, sociologists, economists, and the military of the limitations and capabilities of information processing—but no more. It is the responsibility of the organizations in those other fields to make decisions within their competence and interests. ACM should urge its members to assume their moral obligations as individual citizens and to take part in the shaping of public policy outside our fields.

A resolution was recently adopted by the ACM Washington, D.C. Chapter^[1]. It is for the most part a well-worded and appropriate statement warning that the consequences of using computing equipment in public and private data banks may result in loss of privacy, and urging that technical safeguards against misuse be part of the design. However, the resolution went too far by including a warning about the constitutional right of privacy, and stating that laws protecting the individual must be passed. This is an example of a statement outside the area of competence of a technical society in information processing.

Sections 1.3 and 1.4 emphasize our responsibilities to qualify ourselves before expressing opinions in public outside our areas of professional competence. Too many professional people use their eminence in one field to amplify the importance of their partisan views in another field beyond their areas of professional competence. An example might

be the author of this article who at this point claims to be only an amateur philosopher of ethics, and whose background on the subject is limited to two years of part-time study and research as chairman of the ACM Professional Standards and Practices Committee.

Section 2.4 states that we should produce computer programs and information processing systems that work but be willing to take the responsibility and consequences when they don't work. The eminence, stature, and other benefits of being a professional person are not without their price. The responsibility for failure, even if it would have been beyond the control of the most qualified, still rests on the shoulders of the professional person.

The first part of Section 3.3 is purposely vague in its reference to conducting competition on a high plane. Many of us encounter what we think is unethical competition, and there are some obvious cases, but the information processing industry is changing too rapidly to get more specific on this point. An obvious example of rapid change is the recent emergence of software firms.

Section 3.3 also refers to employees as well as the organizations for whom they work and to self-employed individuals. We all compete whether in job advancement or in technical achievement.

The last part of Section 3.3 is also vague in stating that misconduct should be reported to the proper authorities. This could mean the police, a federal regulatory agency, an individual's own professional society, or the accused individual's professional society. It also has serious implications for ACM. Suppose a member complains to ACM that his employer is forcing him to engage in unethical practices. ACM is not yet mature enough or strong enough to formally advise the member, admonish or punish the employer, insure the member economically against discharge from his job, or even to adequately investigate the matter. In fact, it is not yet clear that the membership wants ACM to function in any of these ways. This is why the ACM Council has wisely adopted ethical rules as a *guide* to members rather than a code to be enforced.

A significant amount of discussion has started concerning the adoption of the Guidelines. Louis Fein^[12] has been of great help to the author in the development of the Guidelines. However, he disagrees with parts which he feels will have significantly different and conflicting meaning to people of different vocations within the field of information processing. For example the industrialist, consultant, employee, academician,

and scientist each has his own relation to society: the scientist to truth; the industrialist to fair profits; the consultant to his clients; the employee to his employer; and the academician to his students. Therefore, Fein feels that they cannot be included under one ethical umbrella and that for these different vocations a single set of ethical rules becomes ludicrous. ACM must first decide which interests it will support and then discard the rest.

Anthony Oettinger, president of ACM, believes ACM should continue to be a home for all vocations within the information processing field. ACM will avoid a partisan battle for the interest of one against an equally sound interest of another. All interests in the field are interdependent. There are transgressions of ethical conduct which by any reasonable code are clear. ACM can start by acting there^[13].

The adoption of ACM Guidelines is only the first small step in a process which will involve years of experience and maturing to recognize and approach adequacy. This first step is justified from the point of view that we must start from some place, even though it is not a perfect start and even though those of the "new morality" of situational ethics barely tolerate ethical maxims while existentialists and anti-nomians (against law) reject them completely^[14]. Tradition and the proven success, (even though partial) of other professional societies strongly motivate us to proceed.

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