CHAPTER TWO

Professionalism and Codes Ethics

2.3.6 Can Codes and Professional Societies Protect Employees?

One important area where professional societies can and should function is as protectors of the rights of employees who are being pressured by their employer to do something unethical or who are accusing their employers or the government of unethical conduct. The codes of the professional societies are of some use in this since they can be used by employees as ammunition against an employer who is sanctioning them for pointing out unethical behavior or who are being asked to engage in unethical acts.

An example of this situation is the action of the IEEE on behalf of three electrical engineers who were fired from their jobs at the Bay Area Rapid Transit (BART) organization when they pointed out deficiencies in the way the control systems for the BART trains were being designed and tested. After being fired, the engineers sued BART, citing the IEEE code of ethics which impelled them to hold as their primary concern the safety of the public who would be using the BART system. The IEEE intervened on their behalf in court, although ultimately the engineers lost the case.

If the codes of ethics of professional societies are to have any meaning, this type of intervention is essential when ethical violations are pointed out. However, since not all engineers are members of professional societies and the engineering societies are relatively weak, the pressure that can be exerted by these organizations is limited.

2.3.7 Other Types of Codes of Ethics

Professional societies aren’t the only organizations that have codifi ed their ethical standards. Many other organizations have also developed codes of ethics for various purposes similar to those of the professional engineering organizations. For example, codes for the ethical use of computers have been developed, and student organizations in universities have framed student codes of ethics.

Even if the professional codes were widely adopted and recognized by practicing engineers, there would still be some value to the corporate codes, since a corporation can tailor its code to the individual circumstances and unique mission of the company. As such, these codes tend to be relatively long and very detailed, incorporating many rules specific to the practices of the company. For example, corporate codes frequently spell out in detail the company policies on business practices, relationships with suppliers, relationships with government agencies, compliance with government regulations, health and safety issues, issues related to environmental protection, equal employment opportunity.

Some of the heightened awareness of ethics in corporations stems from the increasing public scrutiny that has accompanied well-publicized disasters, such as the cases presented in this book, as well as from cases of fraud and cost overruns, particularly in the defense industry, that have been exposed in the media. Many large corporations have developed corporate codes of ethics in response to these problems to help heighten employee's awareness of ethical issues and to help establish a strong corporate ethics culture. These codes give employees ready access to guidelines and policies of the corporations. But, as with professional codes, it is important to remember that these codes cannot cover all possible situations that an employee might encounter; there is no substitute for good judgment.

APPLICATION

CASES

Codes of ethics can be used as a tool for analyzing cases and for gaining some insight into the proper course of action. Before reading these cases, it would be helpful to read a couple of the codes in Appendix A, especially the code most closely related to your field of study, to become familiar with the types of issues that codes deal with. Then, put yourself in the position of an engineer working for these companies—Intel, Paradyne Computers, and 3Bs Construction—to see what you would have done in each case.

The Intel Pentium ® Chip

In late 1994, the media began to report that there was a flaw in the new Pentium microprocessor produced by Intel. The microprocessor is the heart of a personal computer and controls all of the operations and calculations that take place. A flaw in the Pentium was especially significant, since it was the microprocessor used in 80% of the personal computers produced in the world at that time.

Apparently, flaws in a complicated integrated circuit such as the Pentium, which at the time contained over one million transistors, are common. However, most of the flaws are undetectable by the user and don't affect the operation of the computer. Many of these flaws are easily compensated for through software. The flaw that came to light in 1994 was different: It was detectable by the user. This particular flaw was in the floating-point unit (FPU) and caused a wrong answer when double-precision arithmetic, a very common operation, was performed. A standard test was widely published to determine whether a user's microprocessor was flawed.

At first, Intel’s response to these reports was to deny that there was any problem with the chip. When it became clear that this assertion was not accurate, Intel switched its policy and stated that although there was indeed a defect in the chip, it was insignifi cant and the vast majority of users would never even notice it. The chip would be replaced for free only for users who could demonstrate that they needed an unflawed version of the chip [Infoworld , 1994]. There is some logic to this policy from Intel’s point of view, since over two million computers had already been sold with the defective chip.

What did Intel learn from this experience? The early designs for new chips continue to have flaws, and sometimes these flaws are not detected until the product is already in use by consumers. However, Intel’s approach to these problems has changed. It now seems to feel that problems need to be fixed immediately. In addition, the decision is now based on the consumer’s perception of the significance of the flaw, rather than on Intel’s opinion of its signifi cance.

Runway Concrete at the Denver International Airport

In the early 1990s, the city of Denver, Colorado, embarked on one of the largest public works projects in history: the construction of a new airport to replace the aging Stapleton International Airport. The new Denver International Airport (DIA) would be the first new airport constructed in the United States since the Dallas–Fort Worth Airport was completed in the early 1970s. Of course, the size and complexity of this type of project lends itself to many problems, including cost overruns, worker safety and health issues, and controversies over the need for the project. The construction of DIA was no exception.

Perhaps the most widely known problem with the airport was the malfunctioning of a new computer-controlled high-tech baggage handling system, which in preliminary tests consistently mangled and misrouted baggage and frequently jammed, leading to the shutdown of the entire system. Problems with the baggage handling system delayed the opening of the airport for over a year and cost the city millions of dollars in expenses for replacement of the system and lost revenues while the airport was unable to open.

Competitive Bidding and the Paradyne Case

Although competitive bidding is a well-established practice in purchasing, it can lead to many ethical problems associated with deception on the part of the vendor or with unfairness on the part of the buyer in choosing a vendor. The idea behind competitive bidding is that the buyer can get a product at the best price by setting up competition between the various suppliers. Especially with large contracts, the temptation to cheat on the bidding is great. Newspapers frequently report stories of deliberate underbidding to win contracts, followed by cost overruns that are unavoidable, theft of information on others' bids in order to be able to underbid them, etc.

The Paradyne computer case is useful in illustrating some of the hazards associated with competitive bidding.

The Paradyne case began on June 10, 1980, when the Social Security Administration (SSA) published a request for proposals (RFP) for computer systems to replace the older equipment in its field offices. Its requirement was for computers that provide access to a central database. This database was used by field offices in the processing of benefit claims and in issuing new social security numbers. SSA intended to purchase an off-the-shelf system already in the vendor’s product line, rather than a customized system. This requirement was intended to minimize the field testing and bugs associated with customized systems. In March of 1981, SSA let a contract for $115 million for 1,800 computer systems to Paradyne.

Subsequent investigation by SSA indicated that the product supplied by Paradyne was not an off-the-shelf system, but rather was a system that incorporated new technology that had yet to be built and was still under development. Paradyne had proposed selling SSA their P8400 model with the PIOS operating system. The bid was written as if this system currently existed.

Some of the blame for this fiasco can also be laid at the feet of the SSA. There were six bidders for this contract. Each of the bidders was to have an on-site visit from SSA inspectors to determine whether it was capable of doing the work that it included in its bid. Paradyne’s capabilities were not assessed using an on-site visit. Moreover, Paradyne was judged based on its ability to manufacture modems, which was then its main business. Apparently, its ability to produce complete computer systems wasn’t assessed. As part of its attempt to gain this contract, Paradyne hired a former SSA official who, while still working for SSA, had participated in preparing the RFP and had helped with setting up the team that would evaluate the bids. Paradyne had notified SSA of the hiring of this person, and SSA decided that there were no ethical problems with this.

CHAPTER THREE