CHAPTER FOUR

Ethical Problem-Solving Techniques

OBJECTIVES

After reading this chapter, you will be able to

- Apply ethical problem solving methods to hypothetical and real cases

- See how flow charting can be used to solve ethical problems

- Learn what bribery is and how to avoid it.

4-1 Introdaction

Now that we have discussed codes of ethics and moral theories, we are ready to tackle the problem of how to analyze and resolve ethical dilemmas when they occur. In solving engineering problems, it is always tempting to look for an appropriate formula , plug in the numbers, and calculate an answer. This type of problem-solving approach, while sometimes useful for engineering analysis problems, is less useful for ethical problem solving. There are theories that help us to frame our under-standing of the problems.

4-2 ANLAYSIS OF ISSUES IN ETHICAL PROBLEM

A first step in solving any ethical problem is to completely understand all of the issues involved. Once these issues are determined, frequently a solution to the problem becomes apparent. **The issues involved in understanding ethical problems can be split into three categories: factual, conceptual, and moral.**

4-2-1 Types of Issues in Ethical Problem Solving

Let's begin by examining in depth each of the types of issues involved in ethical problems. Factual issues involve what is actually known about a case—i.e., what the facts are. Although this concept seems straightforward, the facts of a particular case are not always clear and may be controversial. An example of facts that are not necessarily clear can be found in the controversy in contemporary society regarding abortion rights. There is great disagreement over the point at which life begins and at which point a fetus can be legally protected. Roe v. Wade, the original Supreme Court decision legalizing abortion in the United States, was decided by the Supreme Court in a split decision. Even the justices of the Supreme Court were unable to agree on this "fact."

4-2-1 Types of Issues in Ethical Problem Solving

In engineering, there are controversies over facts as well. For example, global warming is of great concern to society as we continue to emit greenhouse gases into the atmosphere. Greenhouse gases, such as carbon dioxide, trap heat in the atmosphere. This is thought by climate scientists to lead to a generalized warming of the atmosphere as emissions from automobiles and industrial plants increase the carbon dioxide concentration in the atmosphere. This issue is of great importance to engineers since they might be required to design new products or redesign old ones to comply with stricter environmental standards if this warming effect indeed proves to be a problem. However, the global warming process is not fully understood, and the need to curtail emission of these gases is a controversial topic. If it were known exactly what the effects of emitting greenhouse gases into the atmosphere would be, the engineer's role and responsibility in reducing this problem would be clearer.

4-2-1 Types of Issues in Ethical Problem Solving

Conceptual issues have to do with the meaning or applicability of an idea. In engineering ethics, this might mean defining what constitutes a bribe as opposed to an acceptable gift, or determining whether certain business information is proprietary. In the case of the bribe, the value of the gift is probably a well-known fact. What isn't known is whether accepting it will lead to unfair influence on a business decision. For example, conceptually it must be determined if the gift of tickets to a sporting event by a potential supplier of parts for your project is meant to influence your decision or is just a nice gesture between friends. Of course, like factual issues, conceptual issues are not always clear-cut and will often result in controversy as well.

4-2-1 Types of Issues in Ethical Problem Solving

Once the factual and conceptual issues have been resolved, at least to the extent possible, all that remains is to determine which moral principle is applicable to the situation. Resolution of moral issues is often more obvious. Once the problem is defined, it is usually clear which moral concept applies, and the correct decision becomes obvious. In our example of a "gift" offered by a sales representative, once it is determined whether it is simply a gift or is really a bribe, then the appropriate action is obvious. If we determine that it is indeed a bribe, then it cannot ethically be accepted.

4-2-1 Types of Issues in Ethical Problem Solving

Given that the issues surrounding an ethical problem can be controversial, how can these controversies be resolved? Factual issues can often be resolved through research to establish the truth. It is not always possible to achieve a final determination of the "truth" that everyone can agree on, but generally, further research helps clarify the situation, can increase the areas of agreement, and can sometimes achieve consensus on the facts. Conceptual issues are resolved by agreeing on the meaning and applicability of terms and concepts. Sometimes agreement isn't possible, but as with factual issues, further analysis of the concepts at least clarifies some of the issues and helps to facilitate agreement. Finally, moral issues are resolved by agreement as to which moral principles are pertinent and how they should be applied. Often, all that is required to solve a particular ethical problem is a deeper analysis of the issues involved according to the appropriate principles. Once the issues are analyzed and agreement is reached on the applicable moral principles, it is clear what the resolution should be.

4.2.2 Application to a Case Study: Paradyne Computers

To illustrate the use of this problem-solving method, let's analyze a case study. In 1980, Paradyne, a computer company, bid to supply the Social Security Administration (SSA) with new computer systems. We'll look at the factual issues first. The request for proposals clearly specified that only existing systems would be considered. Paradyne did not have any such system running and had never tested the operating system on the product they actually proposed to sell to the SSA. The employment of a former SSA worker by Paradyne to help lobby SSA for the contract is also clear. In this case, the factual issues do not appear particularly controversial. The conceptual issues involve whether bidding to provide an off-the-shelf product when the actual product is only in the planning stages is lying or is an acceptable business practice.

4.2.2 Application to a Case Study: Paradyne Computers

Is placing a Paradyne label over the real manufacturer's label deceptive? Does lobbying your former employer on behalf of your current employer constitute a conflict of interest? These questions will certainly generate discussion. Indeed, Paradyne asserted that it had done nothing wrong and was simply engaging in common business practices. The issue of the conflict of interest is so hard to decide that laws have been enacted making it illegal for workers who have left government employ to lobby their former employers for specified periods of time.

The moral issues then include the following: Is lying an acceptable business practice? Is it alright to be deceptive if doing so allows your company to get a contract? The answers to these questions are obvious: Lying and deceit are no more acceptable in your business life than in your personal life. So, if conceptually we decide that Paradyne's practices were deceptive, then our analysis indicates that their actions were unethical.

4-3 Line Drawing

The line-drawing technique that will be described in this section is especially useful for situations in which the applicable moral principles are clear, but there seems to be a great deal of "gray area" about which ethical principle applies. Line drawing is performed by drawing a line along which various examples and hypothetical situations are placed. At one end is placed the "positive paradigm," an example of something that is unambiguously morally acceptable. At the other end, the "negative paradigm," an example of something that is unambiguously not morally acceptable, is placed. In between is placed the problem under consideration, along with other similar examples.

4-3 Line Drawing

Those examples that more closely conform to the positive paradigm are placed near it, and examples closer to the negative paradigm are placed near that paradigm. By carefully examining this continuum and placing the moral problem under consideration in the appropriate place along the line, it is possible to determine whether the problem is more like the positive or negative paradigm and therefore whether it is acceptable or unacceptable. Let's illustrate this technique using a hypothetical situation. Our company would like to dispose of a slightly toxic waste by dumping it into a local lake from which a nearby town gets its drinking water. How can we determine if this practice is acceptable? Let's start by defining the problem and the positive and negative paradigms.

4-3 Line Drawing

Problem: It is proposed that our company dispose of a slightly hazardous waste by dumping it into a lake. A nearby town takes its drinking water supply from this lake. Our research shows that with the amount of waste we plan to put into the lake, the average concentration of the waste in the lake will be 5 parts per million (ppm). The EPA limit for this material has been set at 10 ppm. At the 5-ppm level, we expect no health problems, and consumers would not be able to detect the compound in their drinking water.

Positive paradigm: The water supply for the town should be clean and safe.

Negative paradigm: Toxic levels of waste are put into the lake.

4-3 Line Drawing

Let's start by drawing a line and placing the positive and negative paradigms on it:

Negative paradigm (NP)   Positive paradigm (PP)

Dump toxic levels   Water should be
of waste in lake   clean and safe

3.3.7 WHICH THEORY TO USE?

<u>Now let's establish some other hypothetical examples for consideration:</u>

<u>1. The company dumps the chemical into the lake. At 5 ppm, the chemical will be harmless, but the town's water will have an unusual taste.</u>

<u>2. The chemical can be effectively removed by the town's existing water-treatment system.</u>

<u>3. The chemical can be removed by the town with new equipment that will be purchased by the company.</u>

<u>4. The chemical can be removed by the town with new equipment for which the taxpayer will pay.</u>

<u>5. Occasionally, exposure to the chemical can make people feel ill, but this only lasts for an hour and is rare.</u>

<u>6. At 5 ppm, some people can get fairly sick, but the sickness only lasts a week, and there is no long-term harm.</u>

<u>7. Equipment can be installed at the plant to further reduce the waste level to 1 ppm.</u>

4-3 LINE DRAWING

Figure 4.3
Final version of the line-drawing example, with the problem under consideration added.
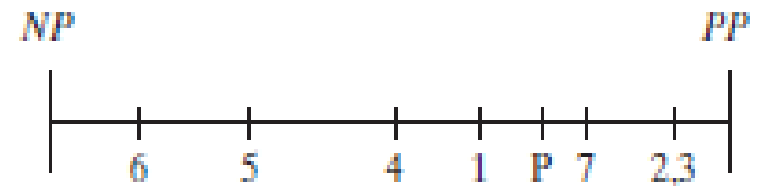
4-3 Line Drawing

As drawn here, it is clear that dumping the toxic waste is probably a morally acceptable choice, since no humans will be harmed and the waste levels will be well below those that could cause any harm. However, since it is somewhat far from the positive paradigm, there are probably better choices that can be made, and the company should investigate these alternatives. It should be noted that although this action seems ethically acceptable, there are many other considerations that might be factored into the final decision. For example, there are political aspects that should also be considered. Many people in the community are likely to regard the dumping of a toxin at any level as unacceptable

Good community relations might dictate that another solution should be pursued instead. The company also might want to avoid the lengthy amount of time required to obtain a permit for the dumping and the oversight by various government agencies. This example illustrates that line drawing can help solve the ethical aspects of a problem, but a choice that appears morally acceptable still might not be the best choice when politics and community relations are considered as well. Of course, the immoral choice is never the correct choice.

Although this problem-solving method seems to help with problem analysis and can lead to solutions, there are many pitfalls in its use. If not used properly, line drawing can lead to incorrect results. For example, line drawing can easily be used to prove that something is right when it is actually wrong. Line drawing is only effective if it is used objectively and honestly. The choice of where to put the examples and how to define the paradigms is up to you. You can reach false conclusions by using incorrect paradigms, by dishonest placement of the examples along the line, and by dishonest placement of the problem within the examples. In our example, we might have decided that the problem is somewhat like example 2 and thus placed our problem closer to the positive paradigm, making this solution seem more acceptable. Line drawing can be a very powerful analytic tool in ethical problems, but only if used conscientiously.

4.3.1 Application of Line Drawing to the Pentium Chip Case

THANKS FOR ATTENTION