

15E OTHER ETHICAL CONSIDERATIONS

WHISTLEBLOWING

What happens when an engineer discovers a dangerous situation that managers fail to acknowledge and correct? After all attempts to resolve it fail, the engineer has the duty to make the situation public, becoming a “whistleblower.” The approach is similar to that of resolving offenses in Matthew 18. Only after confronting the offending party, called “a brother,” taking others along, and still being refused, should the believer bring the matter to the church. It is a “last resort” measure.

Norman Bowie defines a whistle blower this way:

A whistle blower is an employee or officer of any institution, profit or non-profit, who believes that he/she has been ordered to perform some act or he/she has obtained knowledge that the institution is engaged in activities which (a) are believed to cause unnecessary harm to third parties, (b) are in violation of human rights or (c) run counter to the defined purpose of the institution and who inform the public or this fact. [1]

In those situations where an engineer has tried to correct an unsafe or unethical condition and has not been successful, “whistleblowing” may be required. This activity moves the case from an area of company secrecy to public disclosure. It should only be undertaken if

- Public safety or worker safety is at stake
- Other attempts at correction have failed

It should not be undertaken out of revenge or personal anger against the company.

Guidelines [2]

1. Make sure the situation is actually deserving of “whistle blowing.”
2. Completely verify and document your information.
3. Determine the specific wrongdoing involved and the agency or contact person to whom the violation should be reported.
4. Be appropriate in your statement of the allegations.
5. Determine how the whistle blowing should be done: internal or external, anonymous or open, using employed or previous employees.
6. Use the Engineering Code of Ethics to substantiate your actions if necessary and appropriate.
7. Determine if any laws or corporate codes will be violated if the wrongdoing IS or IS NOT reported.
8. Follow proper guidelines (Ethics Hotline, proper forms, proper persons) in reporting the wrongdoing.
9. Count the cost- expect retaliation. You may need a trustworthy lawyer.

SOCIAL RESPONSIBILITY

Are engineers responsible for the use that is made of their designs?

Possibly. If the design is at the complete product or system level (a microwave oven, a commercial jet) the engineer should be able to know and endorse its Intended use. If the design is at the component level (e.g., a pump, a microcontroller) the end use is unknown. The part could eventually be used in a toy, a vehicle, a medical device, or a major weapon.

Should engineers object to the design of SUV's for sale in underdeveloped countries (since most citizens will not be able to afford them)? [3]

Unless we are living there we seldom see American products in actual news in other cultures. SUV's, most often used SUV's, are often the vehicle of choice for schools, orphanages, hotels, and taxi services in less-developed countries.

Is it possible to make a readily affordable appliance (a washer, for example)? We could cut costs by using cheaper belts, gaskets, and motors, but the washer might last only half as long, which doesn't help in the long run. As a better solution we could cut costs by including only the simplest of settings and controls, but would there be a market for these, even among low income families?

Do engineers have a social responsibility?

By virtue of being a profession, says Cohen, engineers have "an obligation to do good." [4]

Most people would agree that they do, but might have difficulty articulating a reason. Ethicist Deborah Johnson has suggested four possible reasons for such responsibility: [5]

1. "Social contract" thinking
Society grants engineers the right to practice engineering, and, in turn, engineers assume a social responsibility.
2. Professional status
Engineers will hold each other to a high standard to avoid sullyng the profession.
3. Personal morality
4. Social obligation theory

ISSUE: "MAKING WORK"

Should a manager "make work" for employees in slack times in order to keep them from being laid off?

It seems like it largely depends on whose money is involved. If you own the company, you can usually decide how to spend the funds and how to pay your employees. If you are entrusted with a project team and a budget you will need to discuss with those above you how to handle this issue.

ETHICS AND COMMUNICATION

In certain cases the key to avoiding a disaster may simply be clear communication. In the Space Shuttle incident the engineers, particularly Roger Boisjoly, were convinced that the solid rocket booster O-rings would not seal adequately at launch temperatures below (58 degrees). They presented their analysis to the managers at Morton-Thiokol, but the managers weren't convinced and pushed for an immediate launch. Usually the managers are presented as the bad guys, responsible for the deaths of the astronauts. Others have asked:

- What if the data been presented more clearly?
- What if the engineers had made a more compelling case?
- When we're faced with a safety issue can we make a compelling case?
- Could we run a simple experiment to show the results of a part failure?
- Could we run a visual simulation showing disastrous results?

ETHICS AND ENGINEERING FIRMS

Many states have requirements regarding the ownership or control of engineering firms:

A business entity offering engineering services to the public typically must register with the State Board of Engineers and receive a Certificate of Authorization. The Certificate of Authorization, or firm license, is necessary to practice engineering in about 75% of states...Applications require proof of incorporation or foreign qualification and typically a fee. Other required items can include notarized bylaws and ownership requirements. For example, in North Carolina there are ownership requirements in order to obtain a Certificate of Authorization. A minimum of two-thirds of the controlling officers, partners, directors, or members of the entity must be engineers and/or professional engineers registered under the laws of any U.S. jurisdiction, and at least one must be an engineer registered in North Carolina. [6]

The requirement for some fraction of the engineering firm owners to be engineers (percentages vary –fifty per cent is required in Texas) is common in several states. The rationale behind the requirement seems to be related to ethics. Purely business people may be willing to go out on a limb with safety/risk issues, while engineers are taught to “hold paramount...the safety.” Engineers (or doctors, or clergy, etc.) can say "As a professional, I cannot ethically put business concerns ahead of professional ethics." [7]

SAFETY AND ETHICS

We live in a fast-moving world (everywhere, of course, except for the Post Office and the Motor Vehicle Bureau.) Many technical and business decisions must be made quickly. Actions regarding safety should never be rushed. Make multiple checks and ask others to verify anything that impacts many people or involves large investments.

Realize that it is impossible to have perfect safety in product development unless accompanied by dozens of safety restraints or a 24-7 personal bodyguard to protect the user from any improper use (both of which are unusable or unaffordable).

WORKPLACE ETHICAL ISSUES

We need to be extremely practical about workplace issues. Some are never discussed until a problem arises. We need to be very clear about such things as

- Hiring practices
- Company loyalty, and what it entails
- Conflict resolution
- “Moonlighting”
- Personal calls on company phones
- Use of company facilities for personal gain
- Harassment

ETHICS OF DESIGN

If we were to follow the Dilbert boss model, the ideal product would be absolutely useless (yet the public would be convinced they can't live without it), outrageously priced (yet selling like hotcakes) and designed to fall apart –or become obsolete –in less than a year. Most engineers would agree that design of useless gadgets fails to meet the purpose of engineering, but planned obsolescence is not so clear an issue. Planned obsolescence is actually illegal in certain countries.

In InfoWorld magazine columnist Ed Foster suggests that the computer industry often makes relatively recent computer systems obsolete by discontinuing parts or accessories for them.

In 1994 Management Accounting invited readers to respond to a case study in planned obsolescence. The accounting people whose responses were published were opposed to redesigning a durable quality product to have a shorter life. However they weren't so much concerned about the ethics of planned obsolescence so much as the possible outcomes for the hypothetical company cited in the case study, which had a solid reputation for high quality products. They warned of the poor public and customer relations that could follow and questioned the wisdom of large investment in redesign of a good product rather diversification of products.

There is a fundamental ethical question involved in designing a death-date into products that goes beyond that of informing consumers. It is about the social responsibility of creating products that have short lives and therefore increase the burden on the planet. The role of engineers in product design is often central. Should engineers be aiming to design more durable commodities? [8]

CLASSICAL ETHICAL THEORIES

There is no absolute list of moral theories. The authors have found the characterization of moral theories in Martin and Schinzinger's engineering ethics book to be very useful. [9]

The following discussion is adapted from the author's 2006 A.S.E.E. paper. [10] The terms are adapted from Martin and Schinzinger's book. [11] They list four broad categories of moral theories, based on classical philosophical ethics:

- Duty Theories
- Virtue Theories
- Utilitarian Theories

These may be summarized as follows:

Duty Ethics (Kantian ethics)

During the enlightenment, Kant, like most other figures, held to varying forms of a duty ethic. Kant's conception of a duty ethic relies on moral absolutes. For Kant, goodness was not determined by divine revelation but by human reason. It is this reason that is our basis for belief in God. Kant's philosophical system revolved around human autonomy, not metaphysical realities. Kant arrived at metaphysical conclusions through a priori knowledge. It is this same a priori approach that Kant believed led to an understanding of goodness. Kant further believed that only good will was truly good and goodwill was not determined by the result of the action but by the intent. But, Kant also only believed that something was only truly goodwill when it was done out of respect for the moral law which can be determined a priori. [12]

Virtue Ethics (originally proposed by Aristotle)

One way to distinguish between virtue and duty ethics is that virtue ethics is about being and duty ethics is about doing. This means that virtue is an issue of character rather than purely action. From a Christian perspective, this distinction can be approached via the following question: "Does God demand something because it is good, or is it good because God demands it?" So, for proponents of virtue ethics, the laws and commandments of scripture are in no way arbitrary. They are reflections of the character of God. And while we should follow those rules, the real issue at hand is what we are not what we do. It is the character of an individual which is important. So while someone adhering to a duty ethic may argue that lying is always wrong, a virtue ethicist will not just look at what the person does but why they do it. What is truly moral is a moral character. [13]

Unfortunately, available engineering ethics handbooks often omit this important educational aspect of practising moral virtues. They concentrate instead on an often scant description of select ethical theories: utilitarianism, duty ethics, rights ethics, virtue ethics. They assume these abilities and virtues as states rather than processes of becoming a moral person. They unrealistically assume that if a person has already acquired these virtues, he or she possesses them in the degree required, rather than perhaps having them more by his/her own diligence, or

losing them by his/her negligence. Since virtues are volatile goods to some extent, a person might work them out in the course of enduring good practices... Also, there is no ethics handbook based on the view of a person practising his/her profession and containing such a description of the professional ethics (in this case, engineering ethics), having assumed the standpoint representative of Christian personalism. [14]

The cardinal Christian virtues have been:

- Prudence
- Justice
- Temperance
- Fortitude
- Faith
- Hope
- Love

Consequentialism (Utilitarian Ethics)

Utilitarianism was initially developed by the philosophers Jeremy Bentham (1748-1832) and John Stuart Mill (1806-1873). It seeks to establish a moral philosophy apart from any divine revelation and focuses only on consequences or results of one's actions. Moral actions and rules (Tell the truth. You shall not steal) are not intrinsically right or wrong. Their value depends on the ends produced (pleasure, knowledge, satisfaction...) [15]

In ordinary life, we make non-moral decisions daily based on consequences. [16]

Mill's approach is often summarized as seeking "the greatest good for the greatest number." This would be ideal if everyone in a society could benefit from a decision and no one would suffer or lose. However, for many real issues someone gains and someone else loses.

The faulty consequences of consequentialism include:

- Consequentialism can allow good ends to justify horrible means.
- In the extreme consequentialism can justify enslavement, property seizure, and even genocide.
- Consequentialism cannot protect the minority (the lesser number).
- Consequentialism cannot predict all possible consequences, particularly unintended negative consequences.
- Consequentialism does not address justice or human rights.

Rom. 3:8, Rom. 6:1 –Should we do evil that good may come? Never.

A consequentialist approach might apply to decisions where there is no clear component of virtue or duty, such as a purely economic decision (Should we replace a piece of equipment that

may wear out in five years? Should I invest in a bond or a CD?) One philosopher suggests that we are all consequentialists when we look for the shortest line at the bank or grocery store. [17]

Consequentialist thinking is often tied to economic decisions which may not affect other people: Should I invest money in a CD or a market account? Which will yield the largest payoff over five or ten years?

Perhaps there is a place for a modified utilitarianism: Seeking the greatest good for the greatest number without causing harm to any.

Value of Virtue Ethics

After reviewing a number of philosophical approaches to ethics (utilitarianism, rights, duty, virtue) Bill Jordan has concluded that Virtue Ethics best provides an approach to ethical issues outside the Code, while being most consistent with Christian ethics:

(The virtue ethics approach), unlike the others, does not concentrate on how to make good decisions. It basically asserts that good decisions will be made by good people. It therefore emphasized the development of strong moral character. I find this approach to be very consistent with my Christian world view. As we continue to make progress towards our goal of becoming people of good character, we will make the right decisions concerning issues we face in life. [18]

Jordan pondered whether a virtue approach would be considered “too religious” for others to adopt, noting the ethics volume by Seebauer and Barry. [19]

Clearly many different cultures have embraced the concept of virtues as being part of a way to analyze the decision making process. The basic virtue ethics approach goes back to Aristotle, who is not regarded as a religious leader. Seebauer and Barry have presented a purely secular version of virtue ethics in their book published by Oxford University Press, which is clearly a secular publisher....A virtue ethics approach to engineering ethics is a concept that can be supported alike by both secular and religious engineers. [20]

SUMMARY -ETHICAL THEORIES

Theory	Duty Ethics	Virtue Ethics	Utilitarian Ethics
Also known as...	Moral command ethics	Character Ethics	Consequentialist Ethics
Developed by	Immanuel Kant	Aristotle	John Stuart Mill
“Good” is defined by...	Adherence to established principles	Being consistent with positive virtues	“greatest good for greatest number”
Positive aspects	Some clear-cut guidance	Promotes and appeals to the individual character	Very practical
Drawbacks	Many issues have no guidelines	No clear-cut guidance	No protection for the vulnerable
Mostly applicable to	Legal-social issues	Decisions involving other persons	Economic decisions

THE “MISSING PIECE” IN ETHICS

Ermer and VanderLeest have written that ethics should be approached as part of the design process, guided by design norms, general principles and moral guidelines for how designs “ought” to be. Beyond such guidelines as reliability and manufacturability, these address the public’s use and offer a tradeoff between technical and ethical constraints. [21]

Classical norms include integrity, harmony, cultural appropriateness, stewardship, open communication, caring, justice, and trust/dependability. [22]

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