Both Duska and Ladd cite corporate self-interest as an obstacle for a balanced employer-employee relationship that is required for mutual loyalty.

Example:

- Consider that corporations often go through downsizing phases in which loyal employees who have served a company faithfully for several years are dismissed as part of restructuring plans.
Sometimes Employers Have Been Loyal

Examples:

- Consider a case in which an employer continues to keep an employee on the payroll even though that employee has a chronic illness, which causes her to miss several months of work.

- Also consider a case in which several employees are kept on by a company despite the fact that their medical conditions have caused the corporation's health insurance costs to increase significantly, thereby reducing the company's overall earnings.
Consider a recent case involving the owner of Malden Mills, whose physical plant in Massachusetts was destroyed by fire.

The mill's proprietor, Aaron Feurstein, could have chosen to rebuild his facility in a different state or country where employees would work for lower wages.

Instead, Feurstein continued to pay and provide benefits for his employees while a new facility was being built in Mass.
Do Computer Professionals Have Special obligations of Loyalty to Their Employers?

- They have to balance their obligation of loyalty owed to an employer against other obligations of loyalty they also may have?

- Loyalty is not something that an employee must give exclusively or blindly to one’s employer.

- Loyalty should also be seen as an obligation that individuals have to society as a whole, especially where safety and health issues are at stake.
Whistle-blowing

- Bowie (1982) defines whistle-blowing as "the act of an employee informing the public on the immoral or illegal behavior of an employee or supervisor."

- Bok (1997) defines whistle blowing as an act in which one "makes revelations meant to call attention to negligence, abuses, or dangers that threaten the public interest."
Whistle-blowing (continued)

- Whistle-blowing situations can arise in cases of overt *wrongdoing* (i.e., involving specific acts that are either illegal or immoral).

- They can also arise in instances of *negligence* where one or more individuals have failed to act.
When Should an Employee “Blow the Whistle”?

- Colleen Rowley, an FBI employee, came forth to describe the way in which critical messages had failed to be sent up the Federal Bureau's chain of command in the days immediately preceding the tragic events of September 11, 2001.

- Was it appropriate for this individual to blow the whistle on her supervisor?

- Was she also possibly being disloyal to her supervisor and fellow employees in doing so?
When Should an Employee “Blow the Whistle” (continued)

- Should individuals in positions of authority in corporations such as Enron and WorldCom have blown the corporate whistle about the illegal accounting practices in those firms?

- One could argue that failing to blow the whistle in the Enron case resulted in thousands of individuals losing their retirement savings, and in some cases their entire life savings.
Cases Where Whistle-blowing Could Have Saved Lives

Three cases:

- Challenger Space Shuttle (O-rings);
- Ford Pinto (faulty gas tank);
- BART case (controversial).
Controversial Political Issues in Whistle-blowing

SDI (‘‘Star Wars’’) Case

- Parnas blew the whistle on Star Wars because of three factors:
  1. The specifications for the software could not be known with any confidence.
  2. The software could not undergo realistic testing.
  3. There would not be sufficient time during an attack to repair and reinstall failing software (no "real-time" debugging).
De George (1981) offers some specific conditions for when an engineer is:

(a) *permitted* to blow the whistle;
(b) *obligated* to do so.
When an Engineer is *Permitted* to Blow the Whistle

1) The harm that will be done by the product to the public is serious and considerable.

2) The engineers (or employees) have made their concerns known to their superiors.

3) The engineers (or employees) have received no satisfaction from their immediate supervisors and they have exhausted the channels available within the corporation, including going to the board of directors.
When an Engineer is *Required* to Blow the Whistle

De George claims that two additional criteria are needed for requiring an engineer to blow the whistle.

4) The engineer has documented evidence that would convince a reasonable, impartial observer that his/her view of the situation is correct and the company policy wrong.

5) There is strong evidence that making the information public will in fact prevent the threatened serious harm.
James (1991) believes that De George's conditions are too lenient.

An individual has a moral obligation to blow the whistle when the first three conditions are met, as well.

We have a prima facie obligation to "disclose organizational wrongdoing" that we are unable to prevent, which could also occur when De George's first three conditions are satisfied.
James’ Critique of De George’s Criteria (continued)

- For James, the degree of the obligation depends on the extent to which we are capable of foreseeing the severity and the consequences of the wrongdoing.

- He worries that De George's model leaves us with no guidance when we are confronted with cases involving sexual harassment, violations of privacy, industrial espionage, and so forth.

- Also there is a problem with the word “harm.”
Alpern’s Criticism of De George’s Criteria

- Alpern (1991) argues that De George's model lets engineers off too easily from their whistle-blowing responsibilities.

- Alpern believes that engineers must be willing to make greater sacrifices than others because they are in a greater position to do certain kinds of social harm.

- He believes that these obligations come from a fundamental principle of "ordinary morality" – viz., we must do no harm.
Ladd’s Defense of De George’s Criteria

- Ladd (1991) believes that requiring engineers to blow the whistle in non-extraordinary cases (such as in De George's conditions 1-3) can be undesirable from an ethical point of view.
  - It demands that these individuals be "moral heroes."

- Engineers should not have to be heroes or "saints."
An Alternative Strategy

- De George and Ladd seem correct in claiming that engineers should not be required to be moral heroes or saints.

- James and Alpern also seem to be correct in noting that engineers, because of the positions of responsibility they hold, should be expected to make greater sacrifices.
McFarland (1991) argues that, collectively, engineers might be held to a higher standard of social responsibility than ordinary individuals.

However, the onus of responsibility should not fall directly on engineers as *individual engineers*.

Rather, it should be shouldered by engineers as members of the *engineering profession*. 
McFarland's model is based on the assumption that, as moral agents, we have a *prima facie* obligation to come to the aid of others.

In describing the nature of this obligation, he uses a non-engineering analogy involving the infamous Kitty Genovese case.
The analogy for engineers, McFarland draws from the Genovese case is that when no other sources of help are available, engineers should take responsibility by banning together.

- If engineers act as individuals, they might not always have the ability to help.

- If they act collectively, however, they might be able to accomplish goals that would otherwise not be possible.
McFarland’s Argument (continued)

- McFarland believes that an engineer's work must be seen in a wider social context, i.e., in its relation to society.

  - Without that context, an adequate account of moral responsibility for engineers can’t be given.

  - Unless engineers work collaboratively on ethical matters, they will not be able to meet all of their responsibilities.
McFarland’s Argument (continued)

- McFarland's model encourages engineers to shift their thinking about responsibility issues from:

- The level of individual responsibility (at the micro-ethical level), to responsibility at the broader level of the profession itself (i.e., the macro-ethical level).
Responsibility, Liability, and Accountability

- **Responsibility** requires that two conditions must be satisfied:
  - **causality**
  - **intent**.

- Some agent, $X$, is held morally responsible for an act, $Y$, if $X$ caused $Y$. 
Responsibility (Continued)

- A person could be held responsible even if he or she did not intend the outcome.

Example:
- Robert Morris, who launched the "Internet worm" in 1988, claimed that he did not intend for the Internet to be brought to a standstill.
- Morris was held responsible for the outcome *caused* by his act of unleashing the computer worm.
Responsibility (continued)

- Agents can also be held responsible when they intend for something to happen, even if they ultimately fail to cause (or bring about) the intended outcome.

Example:

- Suppose a disgruntled student intends to blow up a computer lab, but is discovered at the last minute and prevented from doing so.

- Even though the student failed to carry out his objective, we hold the student morally culpable because of his intentions.
Liability vs. Responsibility

- **Liability** is a legal concept.
- It is sometimes used in the narrow sense of "strict liability."
- To be strictly liable for harm is to be liable to compensate for it even though one did not necessarily bring it about through faulty action (e.g., when a someone is injured on a person’s property).
- The moral notion of "blame" may be left out.
Accountability (vs. Liability and Responsibility)

- Responsibility is only part of what is covered by the notion of *accountability*. (Nissenbaum)
- Accountability means that someone, or some group of individuals, or perhaps even an entire organization is *answerable*.
  - ...there will be someone, or several people *to answer* not only for malfunctions in life-critical systems that cause or risk grave injuries and cause infrastructure and large monetary losses, but even for the malfunctions that cause individual losses of time, convenience, and contentment.
### Responsibility, Liability, and Accountability

<table>
<thead>
<tr>
<th>Moral Responsibility</th>
<th>Legal Liability</th>
<th>Accountability</th>
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<tbody>
<tr>
<td>Attributes of blame (or praise) to individuals.</td>
<td>Does not attribute blame or fault to those held liable.</td>
<td>Does not necessarily attribute blame (in a moral sense).</td>
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<tr>
<td>Usually attributed to individuals rather than &quot;collectivities&quot; or groups.</td>
<td>Typically applies in the case of corporations and property owners.</td>
<td>Can apply to individuals, groups of individuals, and corporations.</td>
</tr>
<tr>
<td>Notions of guilt and shame apply, but no legal punishment or compensation need result.</td>
<td>Compensation can be required even when responsibility in a formal sense is not admitted.</td>
<td>Someone or some group is answerable (I.e., it goes beyond mere liability).</td>
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The Problem of “Many Hands” in a computing Context

- Computer systems are the products of engineering teams or of corporations, as opposed to the products of a single programmer working in isolation.

- So "many hands" are involved in their development.

- It is difficult to determine who exactly is accountable whenever one of these safety-critical systems results in personal injury or harm to individuals.
The Problem of “Many Hands” (continued)

- Two problems for assigning accountability (e.g., Therac 25 Case):
  
  (a) We tend to think of responsibility as something that applies to individuals but not to
  
  (b) We tend to think of responsibility in exclusionary terms: If X is responsible, then Y is not, and vice versa.
Assessing Risk

- Gotterbarn (2001) argues that "ethical risks" associated with the entire "software development life cycle" must also be taken into consideration.

- The life cycle of software includes the maintenance phase, as well as the design and development stages.
Gotterbarn worries that the concept of risk has typically been understood in terms of three conditions, where software is either:

(i) behind schedule;
(ii) over budget;
(iii) fails to meet a system's specified requirements.

Software can satisfy all three conditions and still fail to meet an acceptable standard of risk assessment (e.g. Aegis Radar System).
Gotterbarn believes that failures like the Aegis System are due to:

1. An overly narrow conception of risk;
2. A limited notion of "system stakeholders."
Gotterbarn argues that a model of risk assessment based solely on cost effectiveness, i.e., in terms of criteria such as budget and schedule, is not adequate.

Instead, the notion of risk analysis must be enlarged to include social, political, and ethical issues.
Gotterbarn also notes that the stakeholders who are typically given consideration in risk assessment models for software development are limited to:

- (a) The software developers
- (b) The customers.

This limited notion of "system stakeholders" leads to developing systems that have unanticipated negative effects (Aegis case).

We need a more robust model of risk assessment for software development.