**Role and Responsibilities of Engineers**

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Each of us play a variety of different roles, everything from student, to child, to friend. Each of these roles come with a different set of responsibilities which we need to fulfil.

As engineers, our role demands that we behave in a responsible and ethical manner. An engineer’s responsibilities can be broadly divided into two categories:

1. Passive Responsibilities or Accountability
2. Active Responsibilities or Professional Ideals

## Passive Responsibilities

Passive responsibility plays its part when things go wrong. There are two questions to ask:

* Can someone be held responsible?
* Can they be asked to justify their actions?

The process of holding the people at fault responsible for their actions is called accountability.

Whenever accountability is ignored, no one has any reason to make sure everything is working smoothly. The worse the process is, the more there are opportunities for immoral acts like bribery to crop up.

Another way of looking at this is blameworthiness, i.e., who is being blamed. When there is a lack of accountability, any questions lead to people blaming each other but no one taking responsibility for the problem.

There are a few conditions that need to be met for someone to be blameworthy of a problem:

* **Wrong-doing** – Did the individual or organization do something wrong or that is not the norm?
* **Causal Contribution** – Did the individual or organization do something or not do something that led to the problem occurring?
* **Foreseeability** – Did the individual or organization know beforehand that the problem would occur?
* **Freedom of Action** – Did the individual or organization act of their own volition, without being forced by another body?

## Active Responsibilities

An engineer’s active responsibility is essentially to complete their project successfully, and to work to make the world a better place. Active responsibilities can be understood by exploring the professional ideals of engineers.

One aspect of the professional ideals is the desire to do something to improve the world. The other aspect is the desire to achieve the optimal result from the project.

From these two aspects come the professional ideals:

* **Technological Enthusiasm** – The desire to explore new technological possibilities and solve technological challenges.
* **Effectiveness and Efficiency** – Effectiveness is a measure of to what extent a goal has been achieved and efficiency is its ratio to how much effort was needed to achieve it. Essentially, we need to do our best to make our results effective, but we do need to know when to stop pushing.
* **Human Welfare** – The desire to improve the world.

The first two points run the risk of leading us to immoral activities. For example, there is no doubt that the business platforms of large companies are extremely effective and efficient. However, the methods used to achieve those goals take advantage of other people to do so. From an ethical point of view, the most important ideal to live up to is human welfare.

The professional code of the American Society of Mechanical Engineers (ASME) and the American Society of Civil Engineers (ASCM) states that:

“Engineers shall use their knowledge and skill for the enhancement of human welfare.”

This includes values such as health, the environment and sustainability. This means engineers must hold the safety, health and welfare of the public above everything else. Depending on what work we are doing, the exact meaning of these values and the extent to which each applies to a given situation may vary, but the basic idea is the same everywhere.

## Professional Responsibilities versus Responsibilities as an Employee

There will often be situations where our work will cause us to feel conflicted about our responsibilities, as though we are failing our professional responsibilities due to the work we are doing.

For example, if we develop software that we begin to realize has some detrimental effects on its users, we have a professional responsibility to ensure those effects are completely removed before the final product is shipped. However, as employees, we will have to deal with deadlines and budgets which may not allow this to happen.

We need to be able to handle such conflicts properly, and to help us do this, there are three models.

* **Separatism** – Under this model, engineers make the actual products, but management or political authorities decides what to do with it. The two are separate bodies and are not concerned with each other. A major problem with this model is that engineers might unknowingly become engaged in extremely immoral activities.
* **Technocracy** – Engineers are allowed to make all of the decisions regarding the product under this model. There are a few disadvantages under this model as well. Decisions with regards to public products need to be made by experts on the public who understand how they think and behave. Without that expertise, the decisions will be flawed at best. Technocracy is a paternalistic model. This leads to friction between employees.
* **Whistleblowing** – This simply refers to revealing to the public information about abuses and harmful acts of the organization for which we work. Whistleblowing is not an easy thing to discuss, and in fact requires its own section which we will be seeing below. There are a lot of stressful decisions that must be taken, since the consequences to the whistle-blower are generally unpleasant, with the most extreme cases going as far as people being deported from their country.

None of these models seem to be ideal. The ideal model is actually to allow engineers to think about broader issues and the effects of their work, but to ensure that they are not making decisions on those effects alone.