

## **What is Ethics:**

**Ethics** in the broadest sense refers to the concern that humans have always had for figuring out *how best to live*. The philosopher Socrates is quoted as saying in 399 B.C., "the most important thing is not life, but the good life." We would all like to avoid a life that is shameful and sad, wholly lacking in achievement, love, kindness, beauty, pleasure or grace. Yet what is the best way to achieve the opposite of this – a life that is not only acceptable, but even excellent and worthy of admiration? This is the question that the study of ethics attempts to answer.

Today, the study of ethics can be found in many different places e.g.

**As an academic field of study**, it belongs primarily to the discipline of philosophy, where scholars teach and publish research about the nature and structure of ethical norms.

**In community life**, ethics is pursued through diverse cultural, political and religious ideals and practices.

**On a personal level**, it can be expressed in an individual's self-reflection and continual strivings to become a better person.

**In work life**, it is often formulated in formal codes or standards to which all members of a profession are held, such as those of medical ethics.

Like other fields of the life **Software engineering ethics** is a well-developed area of professional ethics. In 2000, the organization that accredits university programs and degrees in engineering began to formally require the study of *software engineering ethics* in all accredited programs. "Engineering programs must demonstrate that their graduates have an understanding of professional and ethical responsibility." Now to become the member of the Professional Software Engineers it is must to *learn about* and *live up to* ethical standards.

## **Professional Ethics:**

Professional ethics are the code of conduct that governs how members of a profession deal with each other and with third parties.

## **Software Engineering Ethics:**

Software engineering ethics is a large field. In some ways it has been defined as the application of both computer science and engineering philosophy, principles, and practices to the design and development of software systems. Due to this engineering focus and the increased use of software in mission critical and human critical systems, where failure can result in large losses of capital, and heavily affect the society. For software engineering ethics many ethical codes



have been developed by a number of professional societies, associations and organizations (for S/W Engineers these codes are developed by ACM and IEEE-CS).

### **Profession:**

“It is a trade, a business, or an occupation of which one Professes to have extensive knowledge acquired through long years of experience and formal education and the autonomy and responsibility to make independent decisions in carrying out the duties of the profession, and the professional is the person who works in the profession. Well-known professions are law, medicine, and engineering.

### **Characteristics of a Professional**

There are three basic professional requirements, and over the years as the professions evolved, these three elements have taken different forms. They are:

1. *A set of highly developed skills and deep knowledge of the domain.* Although professional skills are developed through long years of experience, such skills must be backed up by a very well-developed knowledge base acquired through long years of formal schooling. Acquiring a sophisticated level of knowledge is crucial because skills based on shallow knowledge of the domain could be damaging to the profession in cases involving decisions that require understanding, analysis, and adoption of concepts to suit the environment or the problem. This requirement alone is enough to differentiate between professionals and those who acquire considerable skills from long years of working in the same domain such as auto mechanics and landscape designers.
2. *Autonomy.* Because professionals provide either products or services, there is always a relationship between the provider of the service and the receiver of the service or the provider of the product and the receiver of the product. In this relationship we are concerned with the power balance. In the case of a professional, the power is in favor of the professional. Take the relationship between a lawyer and a client or a physician and a patient, for example. In either case, there is a power play in favor of the provider of the service. If we consider the example of an auto mechanic, however, there is also a power play in the equation, but this time the power is in favor of the customer, not the provider of the service. There are also marked differences in the way the service is provided by professionals and nonprofessionals. In the case of a professional, there is more room to vary the way a service or a product is provided without consulting the receiver of the way the service is provided without asking the receiver for confirmation or consent. However, in the case of nonprofessionals, the provider of the service cannot vary the way the service is to be delivered without checking with the customer. For example, when you take a car for repair, the mechanic cannot vary from what you agreed on without formally asking you.
3. *Observance of a code of conduct.* A working professional usually observes these four types of codes:
  - *The professional code:* a set of guidelines provided to the professional by the profession bringing out what a professional must to do and not do. A professional code protects both the



image of the profession and that of the individual members. Thus, it is a requirement for the profession that members adhere to the code.

- *A personal code*: a set of individual moral guidelines on which professionals operate. In many ways these guidelines are acquired by professionals from the cultural environment in which they grow up or live in and the religious beliefs they may practice. Whatever the case, a personal code supplements the professional code significantly.
- *The institutional code*: a code imposed by the institution for which the professional is working. This code is meant to build and maintain the public's confidence in the institution and its employees.
- *The community code*: a community standard code developed over a period of time based on either the religion or culture of the indigenous people in the area. It may be imposed by civil law or the culture of the community in which the professional works.

## Pillars of Professionalism

Professionalism is supported by four pillars: commitment, integrity, responsibility, and accountability.

### 1. Commitment

Commitment has these six characteristics:

1. *The person making the commitment must do so willingly without duress.*

The person executing the commitment must like what he or she is doing. If commitments are in the form of assignments with little autonomy, it is more likely the commitment may not be there.

2. *The person responsible must try to meet the commitment, even if help is needed.*

Because commitments are not assignments, the person who has made the commitment is assumed to have the know-how, the autonomy to vary steps, and the skills to do the job. Professionals possess these characteristics, plus they have the ability to seek the necessary skills from others to avoid obstacles that may arise, so more commitment is expected of them.

3. *There must be agreement on what is to be done, by whom, and when.*

Professionals entering into a commitment must have advance knowledge of what is to be done and who is likely to do what part. Entering into a commitment without adequate advance knowledge is highly unprofessional. When the work is divided among other professionals, they themselves must make the same commitment for their respective parts and, in this case, commitment for those smaller parts is as important as the commitment for the whole job. If the smaller parts are assigned to nonprofessionals, they are considered assignments, and the commitment must lie with the professional assigning the parts. Such commitment is carried out through supervision of the nonprofessional members of the team.

4. *The commitment must be openly and publicly stated.* Open commitments are transparent and easily correctable if there are problems. Professional commitments must fall within the allocated resources of time, material, and money. If a commitment is public, there are more chances that most of the sourcing, acquisition, distribution, and use of the resources will be transparent, and thus the job is likely to be done more smoothly.

5. *The commitment must not be made easily.* Before entering into a commitment, professionals should do research to make sure that what they are entering into is not a Trojan horse (something or someone intended to defeat or subvert from within).

6. *Prior to the committed date, if it is clear it cannot be met, advance notice must be given and a new commitment negotiated.* It is a sign of responsibility and commitment to have the courage to



tell others of shortfalls in parts of the agreement so if there is anything to be done to meet the deadlines, it is done without acrimony.

## 2. Integrity

Integrity means a state of undivided loyalty to self-belief. It is honesty, uncompromising self-value, and incorruptible. The word “integrity” comes from the Latin word *integratas*, which means entire, undivided, or whole. To stay undivided in one’s beliefs professionally requires three maxims of integrity: namely, vision, love of what one is doing, and commitment to what one has to do.

- *Vision.* Having vision is the capacity to anticipate and make a plan of action that will circumvent obstacles and maximize benefits. Vision is a sign of good leadership, and professionals who have the initiative, the autonomy, and the authority in the provider–client relationship exemplify leadership.
- *Love.* Numerous studies have shown that people who love what they do, do it better than those who do it because they have to. In school, children who have a love for a subject perform far better than those who do it because it is a requirement. When people choose professions, they should do so because they have a love for the work. The amount of love put in helps maintain morality in one’s actions because what is being done is no longer chore but a creation, and we all know people love their own creations.
- *Commitment.* The vision and love applied to the work bonds the individual to whatever he or she is doing until it is done. This is commitment as we defined it earlier.

## 3. Responsibility

Responsibility deals with roles, tasks, and actions and their ensuing consequences. For example, as parents we have an obligation and a duty to bring up our children. That is parental responsibility. But responsibility also depends on a person’s value system, which is based on his or her environment and culture. There are various types of responsibilities, including personal, communal, parental, and professional, and these responsibilities vary depending on the age of the individual and his or her position in society. For example, the responsibilities of a 5-year old are far different from those of a 40-year old. Clearly the responsibilities of a country’s chief executive are different from those of a janitor. When individuals choose a lifestyle implied in a career or a vocation, they choose and must accept the package of responsibilities that go with that lifestyle.

*Responsibilities of a Professional as a Provider.* A professional in either a provider–client or provider–customer relationship plays the role of provider of either a service or a product. This relationship, as we pointed out earlier, is a contract between the two parties. The relationship consists of three major types of responsibilities: service, product, and consequential.

*Service Responsibilities.* In order for a professional to provide a service to a client, there must be a contract binding the professional and the client. In this contract, as in any other contract, the professional has specific responsibilities regarding the time of delivery of the service, the quality of the service, and the consequences after the service has been rendered. For example, in the time-constraint responsibility, the service must be rendered within an agreed time frame; if not, a new time must be negotiated. In the quality of service responsibility, the service must meet its desired goal as far as the client is concerned, and it must have the expected value. The consequence responsibility involves the safety of the client from harm, both physical and financial, after receiving the service. The provider must take all these responsibilities seriously.



*Product Responsibilities.* If the contract between the provider and the client involves a product, the provider has the responsibility to deliver the product agreed upon on time, in good shape and of quality, and to provide documentation for safe use of the product. The provider of the product is responsible for all liabilities that might arise as a result of use of the product. In liability cases, the provider responsibility depends on the contract and the degree of harm.

*Consequential Responsibilities.* In a television medical drama episode I watched, an operating room scene showed a female doctor dancing to a reggae tune while operating on a patient and unknowingly sewing the patient up with a surgical metal clip still in the patient's chest. In the next scene the patient has died and the post-mortem shows the metal clip is still in his chest. Before the results of the post-mortem, the doctor remembers her error and naturally becomes remorseful, not knowing whether to tell the family right away or wait until the medical report is issued. She knows full well that whatever the case, the family is going to sue her and the hospital, and probably her job at that hospital and her medical career are over. There is remorse on the part of the doctor and anger on the part of the patient's family, all because one person did not fulfill her responsibilities. Remorse and anger are aftereffects of an action gone wrong, in this case a professional service. Whether a professional has provided a service or a product, there are always aftereffects of that action. Oftentimes one is praised for a service well done and the best product ever provided, but there are also times when one is remorseful because a service did not produce what it was intended to or a product did not live up to expectations. In the worst-case scenario the service or product may cause physical or financial harm to the client. In such cases, one expects liabilities for the service or product, and the professional must accept those consequential responsibilities. In the case of the doctor, the service she provided fell short of what was expected, and she had to face the consequential responsibilities of her actions, which at times not only include the parties involved but may also involve innocent bystanders.

#### **4. Accountability**

One way we can define accountability is the obligation to answer for the execution of one's assigned responsibilities. This process involves the "cycle of setting measurable goals, planning what needs to be done to meet those goals, reporting progress towards goals, evaluating the reports, and using that feedback to make improvements". Accountability involves these three key elements:

*1. A set of outcome measures that reliably and objectively evaluate performance:*

In every profession there is a minimum set of measures that every individual in that profession must meet. This set must be carefully selected and those measures must be achievable. However, these measures vary according to the profession and the individual activity to be performed by the professional. For example, in the teaching profession, one of the measures might be the success rate of students when they take standardized examinations.

*2. A set of performance standards defined in terms of these outcome measures:*

Like outcome measures, performance standards must be carefully chosen and attainable. These standards are also very dependent on the profession, but each profession must have a set of common performance standards for all its members for every type of service or product provided by that profession. For the teaching profession, the standard of output measures may be the passing of standardized examinations at a certain predetermined level. In the law profession, it might be the ability of a judgment to stand on subsequent appeals. Whatever standard measure is chosen, it must be plausible and measurable.

*3. A set of incentives for meeting the standards and/or penalties for failing to meet them:*



The incentives chosen must be good enough so as not to create undesirable motives. For example, if the incentives are too good, they may force professionals to put the interest of their customers and clients below the interest of attaining the measures. If the incentives are monetary, they may force professionals to put the interest of making money ahead of the services they are supposed to offer. Similarly, the penalties prescribed must not be so harsh that they drive away those who intend to enter the profession. Harsh penalties also tend to make people in the wrong hide their actions and dig in deeper for fear of being discovered.

## **Professional Relationships**

A professional relationship is an ongoing interaction between two people that observes a set of established boundaries or limits that is considered appropriate under governing ethical standards. Establishing proper professional relationships is the backbone of professional life. The nature of a person's relationships with colleagues and those under direct care, management or supervision can determine success in a chosen professional.

A professional relationship is typically characterized by collegiality (relationship between colleagues) that doesn't cross over into over-familiarity or inappropriate closeness. Most professions have code of conduct that governs interpersonal relationships to prevent improprieties ranging from burden to harassment. Failing to maintain the proper level of professionalism in relationship can lead to loss of employment and legal problems.

Professional relationship is categorized into the following categories

### **1. Relationship with employers and employees:**

#### *a. Loyalty:*

In general employees are expected to show loyalty to their employers - they are expected to recognize and help the employer achieve her ends. But there are limits to loyalty, for example the employee must retain the right to support the political party of their choice without threat of job loss, and they must not be expected to buy only company products, in preference to the competitor's.

#### *b. Trade secrets:*

In a free labour market it is difficult to protect trade secrets. A company can afford to hire a competitor's employee at a higher price than the competitor if the employee carries information that gives the company a market lead over its competitor. Companies attempt to guard against this practice in several ways. Employees can be asked to sign agreements promising not to reveal trade secrets. They can even be asked to agree not to work in the same industry for a set period after they leave a company. Whether or not the employee has entered into such an agreement, there is a moral sense in which loyalty should carry over beyond the term of employment.

#### *c. Practical issues:*

As an employer, the protection of workers, and the provision of a safe environment are ethical obligations and sound business practices. It is also a legal obligation.

### **2. Relationship with clients:**



There are roughly three ways the relationship can be seen and it is necessary for a smooth running relationship that there is some agreement about what sort of relationship it is. Essentially the difference concerns the balance in decision making between the company and the client. If the company is seen as the agent of the client, it simply carries out the client's wishes; it does not make any significant decisions of its own. When it has to make a decision about aspects of design that are not obvious from the client's wishes, then it must return to the client for clarification. *This is the agency model.* At the other extreme, the client may transfer all the decision-making authority into the hands of the company. In this case the company first learns as much as it can about what the client wants and then, during the process of development, makes all the decisions about how best to realize the client's desires. *This latter is the paternalistic model.* In between these two extremes is what we might call the *partnership model* where the client is engaged in making decisions but is advised by the company. The decisions are not entirely the client's, nor are they entirely the company's. Decisions are arrived at through a process of dialogue in which the client expresses her wishes and desires and the company advises on what is possible from a practical and what is advisable from their own point of view of superior experience. In fact there are not three clearly defined relationships, but a whole spectrum of them. But it is important to raise the issue of what kind of a decision process is to be adopted in order to avoid confusion and conflict arising later in the development process.

### **3. Relationship with the public in general**

Only in the last few decades have professional bodies begun to include responsibilities to the public in their codes of conduct. But clearly professional activities can put the public at risk. The professional may see ways of cutting costs (and thus increasing his profits), but which may create risks to the public (e.g., creating a flight control system). He has no legal obligation to avoid those risks, and doing so does not come into the job specification. But clearly he has a moral obligation to avoid cost cutting where risk is increased. And in the last few decades the special knowledge that the professional has of possible risks to the public at large has begun to figure in what are considered professional obligations – in some cases these professional obligations are legally established. The UK Disability Discrimination Act 1995, fully in force since October 2004, places a duty on organizations to provide equality of access for disabled people.

### **4. Relationship with other professionals:**

There are two major aspects in relations with other professionals. One is to treat your colleagues with dignity and respect, and the other is to encourage and support fellow members in their professional development and, where possible, provide opportunities for the professional development of new members. In general it is in the interest of the profession to regulate the behavior of their members. An individual who does not act in the interest of the client will damage the reputation of the profession as a whole. And when the trust that people place in the profession is damaged.