PROFESSIONAL ETHICS

HUT 200

KAILAS SREE CHANDRAN

SEMESTER 3 / 4

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PROFESSIONAL ETHICS

Based on revised syllabus of APJ Abdul Kalam Technological University Kerala (KTU)
Subject code: HUT 200 (Common)
Semester 3 / 4
B.Tech
Scheme: 2019

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PROFESSIONAL ETHICS
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PREFACE

This textbook is prepared based on the syllabus of the subject **Professional Ethics (HUT 200)** for Semester 3/4 (Common), B.Tech course, 2019 scheme of APJ Abdul Kalam Technological University (KTU). Notes for all five modules have been included in this book. Students are advised to refer prescribed text books for understanding the subject thoroughly. This textbook can be used as an additional reference for improving the knowledge on the topic.

The softcopy of this book and additional study materials can be found in the link scanning the QR code. Please send your valuable suggestions and feedback about this textbook to the below mentioned email address.

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SYLLABUS

Code.	Course Name	L	T	P	Hrs	Credit
HUT 200	Professional Ethics	2	0	0	2	2

Module 1 – Human Values.

Morals, values and Ethics – Integrity- Academic integrity-Work Ethics- Service Learning- Civic Virtue- Respect for others- Living peacefully- Caring and Sharing- Honestly- courage-Cooperation commitment- Empathy-Self Confidence -Social Expectations.

Module 2 - Engineering Ethics & Professionalism.

Senses of Engineering Ethics - Variety of moral issues- Types of inquiry- Moral dilemmas –Moral Autonomy – Kohlberg's theory- Gilligan's theory- Consensus and Controversy-Profession and Professionalism- Models of professional roles-Theories about right action –Self interest-Customs and Religion- Uses of Ethical Theories.

Module 3- Engineering as social Experimentation.

Engineering as Experimentation – Engineers as responsible Experimenters- Codes of Ethics- Plagiarism- A balanced outlook on law - Challenges case study- Bhopal gas tragedy.

Module 4- Responsibilities and Rights.

Collegiality and loyalty – Managing conflict- Respect for authority- Collective bargaining- Confidentiality- Role of confidentiality in moral integrity-Conflicts of interest- Occupational crime- Professional rights- Employee right- IPR Discrimination.

Module 5- Global Ethical Issues.

Multinational Corporations- Environmental Ethics- Business Ethics- Computer Ethics -Role in Technological Development-Engineers as Managers- Consulting Engineers- Engineers as Expert witnesses and advisors-Moral leadership.

CONTENTS

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MODULE 1: HUMAN VALUES

Morals, values and Ethics – Integrity- Academic Integrity-Work Ethics- Service Learning- Civic Virtue-Respect for others- Living peacefully- Caring and Sharing- Honestly- Courage-Cooperation Commitment-Empathy-Self Confidence -Social Expectations.

1.1 INTRODUCTION

Human values have been employed in so distinctively different ways in human discourse. It is often said that a person has a value or an object has a value.

If one wants to know the origin of the term 'VALUE', it may be stated very firmly that the term 'VALUE' comes from the Latin word 'VALERE' which means 'to be of worth'. Whereas, the concise Oxford Dictionary defines the term VALUE' as the 'worth, desirability or utility of a thing'.

In fact, it is difficult to define values, for they are as comprehensive in a nature as our human life. Somewhere, some other dictionary states that Value is that which renders anything useful, worthy or estimable. It is price, worth or importance of a thing'.

Value is "a concept explicit of implicit, distinctive of an individual or characteristics of a group of those desirable traits which influence the selection from available modes and ends of action."

In fact, value is an abstract term which is commonly regarded as an economic conception. In the words of John Dewey, "Value means primarily, to price, to esteem, to appraise, to estimate. It means the act of cherishing something holding it clear and also, the act of passing judgement upon the nature and amount of its value as compared with something else,"

Values are defined as something which are desirable and worthy of esteem for their own sake. Human values are defined as those values which help man to live in harmony with the world.

Values that may be included in the general definition of human values are love, brotherhood, respect for others — including plants and animals — honesty, sincerity, truthfulness, non-violence, gratitude, tolerance, a sense of responsibility, cooperation, self-reliance, secularism and internationalism.

1.2 VALUES

Generally, value has been taken to mean moral ideas, general conceptions or orientations towards the world or sometimes simply interests, attitudes, preferences, needs, sentiments and dispositions.

Values are stable, long lasting beliefs about what is important to an Values are a very powerful but individual. Values are very important to the study of the organisational behaviour, silent force affecting human because values have an important influence on the attitudes, perceptions, and needs and motives of the people at work. Values are the basis of human personality and are a very powerful but silent force affecting human behaviour.

Values are so much embedded in the personalities of the people that they can be inferred from people's behaviour and their attitudes. Effective managers have to understand the values underlying the behaviour of the employees, because only then they will realize why the people behave in strange and different ways sometimes.

Meaning and Definition of Values:

A value system is viewed as a relatively permanent perceptual frame work which influences the nature of an individual's behaviour. The values are the attributes possessed by an individual and thought desirable. Values are similar to attitudes but are more permanent and well built in nature.

Importance of Values:

(i) Values lay the foundations for the understanding of attitudes and motivation.
(ii) Personal value system influences the perception of individuals.
(iii) Value system influences the manager's perception of the different situations.
(iv) Personal value system influences the way in which a manager views the other individuals and the groups of individuals in the organisation.
(v) Value system also influences a manager's decisions and his solutions to the various problems.
(vi) Values influence the attitudes and behaviours. An individual will get more job satisfaction if his values align with the organisation's policies. If the organisation's policies are different from his views and values, he will be disappointed; the disappointment will lead to job dissatisfaction and decline in performance.
(vii) The challenge and reexamination of established work values constitute important corner stones of the current management revolution all over the world. Hence, an understanding of the values becomes a necessity.

Sources of Values:

1. Family Factor:
The most important factor which influences the value system of an individual is his immediate family. Some values are inculcated in A person learn and develops values from the following sources the individuals from the childhood and remain in his mind throughout his life. The child rearing practices the parents adopt shape the personality of the human being. Family is the most influential factor in the individual's learning of social behaviour, values and norms.

2. Social Factors:
Out of all the social factors school plays the most important role in developing the value system of an individual. The child learns the basic discipline from the school. Moreover, the interactions with the teachers, classmates and other staff members in the schools and colleges make the child inculcate values important to the teaching-learning process. Other social factors which may affect values are religious economic and political institutional in the society.

3. Personal Factors:
Personal traits such as intelligence, ability, appearance and educational level of the person determine his development of values. For example, if a person is highly intelligent, he will understand the values faster. If he is highly educated, high values will be inculcated in him by his school and college.

4. Cultural Factors:
Cultural factors include everything that is learned and passed on from generation to generation. Culture includes certain beliefs and other patterns of behaviour. An individual is a participant in social culture, group culture and organisational culture. Thus, he is known as a composite of many cultural elements. Culture is based on certain implicit and explicit values. For example, whether a person is co-operative, friendly or hostile depends upon to which culture he belongs to Individual relationships are different in different cultures and within certain groups of society also. Whether, the individual values money making or doing service to the mankind again depends upon his cultural background.

5. Religious Factors:
Individuals, generally, receive strength and comfort from their religion. Religion comprises of a formal set of values which are passed on from generation to generation. Advancement in technology has under viewed faith in traditional religious beliefs and values.

6. Life Experiences:

A man learns the most from his own personal life experience. Sometimes man can learn from the experience of others also. In the long run, most of the values which influence our behaviour are validated by the satisfaction we have experienced in pursuing them. Individuals work out their values on the basis of what seems most logical to them.

Values carry importance in direct proportion to how much faith the individual has in them. He should have those values which can stand the test of reality. He should not have rigid values but flexible system which can change with the changes in the individual himself, his life situation and the socio-economic environment.

7. Role Demands:

The role demand refers to the behaviour associated with a particular position in the organisation. All organisations have some formal and some informal code of behaviour. Role demand can create problems when there is a role conflict. Thus, the managers will have to quickly learn the value system prevalent in the organisation.

If they want to move up the ladder of success. For example, if the informal code of behaviour says that the manager must mix up socially with the subordinates, he should learn to do so even though, his personal value system conflicts with his role as a manager.

8. Halo Effect:

The halo effect refers to the tendency of judging people on the' basis of a single trait, which may be good or bad, favourable or un-favourable. Sometimes, we judge a person by one first impression about him or her. For example, if a person is kind, he will also be perceived as good, able, helpful, cheerful, nice, and intelligent and so on.

On the other hand, if a person is abrasive, he shall also be perceived as bad, awful, unkind, aggressive, harmful and wicked. Thus, what one sees in the universe depends partly on one's inner needs. Thus, with the help of halo effect, we see certain values in others which are actually not there, but we perceive them to be there.

Types of Values:

I. Ultimate Values:

Value statements that identify the significance of certain ideas, experiences and activities to us, are the ultimate values. These go beyond mere statements of intellectual belief to the extent that they represent the beliefs that affect our decision on how to live.

Human beings tend to rank their values in a rough order of priority, in accordance with ultimate beliefs about the world and their place in it. Religious traditions

represent the most systematic attempts to explain our place in the world, and supply different accounts. There are certain value statements about the Ultimate Values that represent the level of agreement achieved between several theistic religious traditions.

The following aspects show or represent the ultimate values taken for granted from four different angles:

1. Life Perspectives:
Here God is taken as the Creator and Self-revealer and about the religion is it said that religion arises from the human responses to God.

2. Individual:
Each individual realizes God given wholeness and is to encourage self-respect and learn from cultural traditions.

3. Society:
Each individual recognises the human rights and is consistent with what we know to be the law of God – developing relationship in accordance with God's commandments.

4. Natural World:
Nature is appreciated as a gift of God and our relationship to nature is that of stewards, charged with managing it in trust for future generations.

Democratic Values:
Democracy consists of a Society in which all people have equal rights to participate in the political process, while exercising the freedom to live as they choose, provided they do not infringe the right of others to do the same. Democracy, therefore, is a procedural notion, not an ultimate vision of living.

For this reason, people with differing ultimate values may be prepared to accept a number of values whose practical justification is the maintenance of a viable democratic state and sustainable environment, thought they might have different ultimate reasons for being prepared to endorse those values.

The following aspects show or represent the Democratic Values taken for granted from four different angles:

1. Life Perspectives:
Here, search for knowledge, especially that which enhances the achievement of the other ends, is taken for value consideration. So too, right of all individuals to freedom to worship or not to worship is taken into consideration.

2. Individual:
Here, the basic rights of all people regardless of differences to race, gender, ability and religious belief, is thought of and each individual is encouraged to contribute to the community services consistent with good citizenship.

3. Society:
Responsibility is provided as a safety net for those in the society who lack the capacity through sickness, disability or unemployment, to sustain a viable lifestyle.

4. Natural World:
Nature is taken for conservation of the environment, and the need to continue to develop natural resources to sustain human life is taken into consideration.

II. Educational Values:

In addition to the values associated with common life with regards to Ultimate Values as well as Democratic Values, education draws on:

(i) Values intrinsic to the knowledge it seeks to impact, and
(ii) The ethics of providing instruction to human beings within the constraints of the classroom.

The following aspects show or represent the Educational Values taken for granted from four different angles:

1. Life Perspectives:
Encouragement is given to the students to explore the moral point of view and to develop a personal value system.

2. Individual:
Every child has the right to access to available knowledge at an appropriate developmental level.

3. Society:
Critical reflections are recognised on both the cultural heritage and the attitudes and values underlying current social trends. A social obligation to support research that promises to improve the quality of human life and to share the benefits as widely as possible is also noted.

4. Natural World:
There is a human drive to understand the realities of the world as being a valid quest for truth in its ultimate unity, and the aims of understanding of all the domains of human experiences — especially physical, intellectual, aesthetic, social, moral and spiritual is promoted.

Values, at the outset are not bifurcated as shown in the above manner alone, but values are, at the outset are divided into still many other ways. They are Subjective and Objective types of values.

a. Subjective (Or Internal) Values:
Some educators hold the view that educational values are internal and subjective. They are biological and psychological in origin. They satisfy the wants and desires of the student. They do not have any intrinsic or inherent worth of their own. Only the students or teacher 'value' them from his or her point of view and needs, instincts and emotions.

b. Objective (Or External) Values:
There are other educators who regard educational values as external and objective. They do not believe that they are just internal or private concern of the teacher of the student. The followers of this view believe that personal desire may be an important element of educational value, but they hold that values are independent of such desire.

Values are again divided into:
(i) Instrumental and
(ii) Intrinsic Values.

1. Instrumental:
The Instrumental Values are values which are judged good for something. That is, their values are dependent on the consequences or the outcomes.

2. Intrinsic Values:
On the other hand, Intrinsic Values are interest in the objects, not imposed or applied by outside agencies. They are judged good not for something else, but are good in and of themselves. There are still another two types of values from an altogether different point of view to Value'.

1.3 MORALS

Morals are the prevailing standards of behavior that enable people to live cooperatively in groups. Moral refers to what societies sanction as right and acceptable.

Most people tend to act morally and follow societal guidelines. Morality often requires that people sacrifice their own short-term interests for the benefit of society. People or entities that are indifferent to right and wrong are considered amoral, while those who do evil acts are considered immoral.

While some moral principles seem to transcend time and culture, such as fairness, generally speaking, morality is not fixed. Morality describes the particular values of

a specific group at a specific point in time. Historically, morality has been closely connected to religious traditions, but today its significance is equally important to the secular world. For example, businesses and government agencies have codes of ethics that employees are expected to follow.

Some philosophers make a distinction between morals and ethics. But many people use the terms morals and ethics interchangeably when talking about personal beliefs, actions, or principles. For example, it's common to say, "My morals prevent me from cheating." It's also common to use ethics in this sentence instead.

So, morals are the principles that guide individual conduct within society. And, while morals may change over time, they remain the standards of behavior that we use to judge right and wrong.

1.4 ETHICS

As per Oxford Dictionary the meaning of ethic is a **"system of moral principles, rules and conduct."** Ethics is a "science of morals." The words ethics has emerged from Latin 'Ethicus' or in Greek 'Ethicos'.

'Right', 'Fair' and 'Proper' are three terms normally used to express the social behaviour of the people. When we tell these words, there are right and wrong behaviour towards others; fair and unfair actions taken against someone or for someone; or some fair or unfair decisions.

The beliefs what is right, what is fair and what is proper are our beliefs and our moral standards. The beliefs differ from individual to individual, place to place and time to time. What is right in one place or situation may be wrong in other situation. The moral standards also differ based on moral value an individual attaches.

Any action can be termed good or right or bad or wrong are relative and moral judgments. The problem has one more side that who is making the judgment. From different sides the problem is seen in different light and accordingly the judgment. The distinctions are made as 'us' and 'others' or 'benefits' and 'obligations'.

Importance of Ethics:

(1) Part of Society:
Business is part of society. Whatever ethical principle apply in society apply to business. Example tax evasion is considered unethical in society. If a company deliberately evades tax payments the company is treated unethical.

(2) Expectations of Public:
All stakeholders have an eye on the culture and behaviour of a business organisation due to dominance of economics in the society. The public expects a high level of ethical behaviour from the business organisations.

'Doing the right thing', 'Do no harm' and 'Good to all' are the expectations of general public from business. Example: a company manufacturing a tobacco based products say 'pan masalas' and making advertisements appealing to college students in not respected. Whereas a company that recalls unsafe product is respected.

(3) Trust of Employees:
High level of morale and productivity can be easily obtained in companies that treat their all employees with equality, encourage good team and work culture, and with ethical practices. The employees in the company as well as those connected feel good and develop a mutual trust. Employees get attraction to ethically and socially responsible companies.

(4) Image:
An ethical organisation command trust and respect of all its stakeholders. The organisation builds image for itself. Ethical good image is important because all stakeholders stand to gain.

(5) Costs:
Deterioration of relationships, damage to reputation and reduction of employee productivity, loyalty that come out of unethical practices cost companies. An uncaring employer will find it difficult to employ good professions for his business.

(6) Pride of Best Companies:
The ethically managed companies command respect from public as well as government organisations. 'Fortune' magazine publishes yearly best companies. Similarly Indian will managed companies are published by 'Business India'. These companies have a brand value and accepted as leaders in the industry. The company policies with regards to profit sharing bonuses, social responsibility, balance of work and social life are quoted.

(7) Overall Benefit:
Ethical behaviour of an industry or business gives a win-win situation to all the stakeholders and general public. The governments also encourage such companies. The integrity and ethical practices become all-pervading in the organisation and increase organisational effectiveness.

Morality	*Ethics*
1. More general and prescriptive based on customs and traditions.	1. Specific and descriptive. It is a critical reflection on morals.
2. More concerned with the results of wrong action, when done.	2. More concerned with the results of a right action, when not done.
3. Thrust is on judgment and punishment, in the name of God or by laws.	3. Thrust is on influence, education, training through codes, guidelines, and correction.
4. In case of conflict between the two, morality is given top priority, because the damage is more. It is more common and basic.	4. Less serious, hence second priority only. Less common. But relevant today, because of complex interactions in the modern society.
5. Example: Character flaw, corruption, extortion, and crime.	5. Example: Notions or beliefs about manners, tastes, customs, and towards laws.

1.5 INTEGRITY

Integrity is one thing that every business should have. When employees follow work ethics, they show integrity to the outside world. Customers believe in the company and also business prospects increase. Every industry has its own ethical guidelines, and a business should make sure that they follow these standards.

Integrity is a term used to describe a person's level of honesty, moral commitments, and willingness to do what's right. For example, we expect our doctors to be honest with us about diagnoses, won't try to prescribe medications we don't need, and will generally work in the best interest of our health and well-being. We expect this because, in most societies, doctors are perceived to be people of great integrity with strong moral compasses.

1.6 ACADEMIC INTEGRITY

One of the earliest encounters you are likely to have had with integrity (outside of your family) is in an academic environment. Specifically, your teachers and instructors will expect every assignment you turn in to be 100% your own work. This means that you are expected not to **plagiarize**, which is the copying of someone else's ideas or words that you pass off as your own. In some cases, plagiarism can be unintentional, which is why it's very important that you are certain the words and ideas in your work are completely your own.

In academic contexts and scholarly work, integrity is of tremendous importance. For example, when college professors write books or perform experiments, it is expected that their theories and assertions are backed up by rigorous research for which they provide citations. In cases where it has been discovered that someone has falsified research data or outright lied, that person can face a number of consequences because he or she was expected to work with honesty and integrity.

Academic integrity is the commitment to and demonstration of honest and moral behavior in an academic setting. This is most relevant at the university level as it relates to providing credit to other people when using their ideas. In simplest terms, it requires acknowledging the contributions of other people. Failure to provide such acknowledgement is considered plagiarism.

Five Pillars of Academic Integrity:

The International Center for Academic Integrity (ICAI) has identified five pillars of academic integrity to generate positive conversations about integrity.

Pillar 1
Honesty is sincerity. All other pillars of academic integrity have some basis in honesty. Honest individuals take stock of individual abilities and represent their effort fairly.

Pillar 2
Trust in other people and in your community eases working relationships. Trust is established in a system where all members are doing their best work, where structures and policies are fair and all will be treated fairly.

Pillar 3
Fairness goes hand in hand with trust. Every individual should believe that they will be treated fairly and judged by the same standard as all others in the community. For example, you can trust that your professors will evaluate all work fairly and not favor one person over another. The best work comes out of a fair system.

Pillar 4
Respect allows for individual points of view and opinions to be shared. Students show respect by "listening to other points of view, being prepared, meeting deadlines, and performing to the best of their ability." Instructors show respect by listening to students' ideas and "providing full and honest feedback."

Pillar 5
Responsibility means acknowledging your agency and accountability in daily actions and in your work. Everyone is personally invested in performing their work with integrity and encourages others to act with integrity too. Academic integrity starts with individuals and positively influences the entire community.

1.7 WORK ETHICS

Traditionally, work ethic has been understood as a value based on hard work and diligence. Capitalists, for example, believe in the necessity of working hard and in consequential ability of enhancing one's character. Socialists suggest that a concept

of "hard work" is deluding the working class into being loyal workers of the elite; and working hard, in itself, is not necessarily an honorable thing, but simply a way to create greater wealth for those at the summit of the economic pyramid.

These values have been challenged and characterized as submissive to social convention and authority, and not meaningful in and of itself, but only if a positive result accrues. An alternative perception suggests that the work ethic is now subverted in a broader, and readily marketed-to society. This perspective has given us the phrase "work smart".

In recent times, many say that a work ethic is now obsolete and that it is no true any longer that working more means producing more, or even that more production leads to a better life… this is, of course, not to be confused with quality productivity.

Importance of Work Ethic:

Those with a strong work ethic have inculcated principles that guide them in their work behavior. This leads them to consistent higher productivity, without any prodding that many require to stay on track. Therefore, whether staff are naturally this way or need be trained, if possible, into such an attitude is determined by the managers.

Productive Work

Individuals with a good work ethic are usually very productive people who work at a faster pace. They regularly accomplish more work, more quickly than those who lack a work ethic, for they do not quit until the work which they are tasked is completed. At least in part, this is also due to the fact that they wish to appear to be stronger employees, and thus, they wish to appear to be of more benefit to their managers and the company.

Cooperation

Cooperative work can be highly beneficial in a business entity, individuals with a good work ethic know this well. They understand the usefulness of cooperation, e.g., teamwork – they often put an extensive amount of effort into working well with others.

Such people usually respect company authority enough to cooperate with anyone else with whom they are paired, in a polite and productive way, even if the individuals in question are not so ethically inclined.

Ethics in Organizational Culture

Employers, executives and employees, all adhering to an ethics code stimulate an ethical work culture. Business leaders must lead by exhibiting the behavior they wish to see in employees.

Reinforce ethical conduct by rewarding employees who show the integrity and values that coincide with company policy, and discipline those who make the wrong ethical decisions. Positive ethics culture improves morale in a business, plus it may increase productivity and employee retention which cuts the costs of employee churning, consequentially financially benefitting an organization as improved productivity improves company efficiency.

Basic Work Ethic for an Organization:

Ideally, the policies a business operates with are compassion, fairness, honor, responsibility, and integrity. One of the best ways to communicate organizational ethics is by training employees about company standards. Basic work ethics for any organization should include:

- **Uniform rules and regulations:** An ethical organizational example is the common treatment of all staff, i.e., with the same respect, regardless of race, culture, religion, or lifestyle, with equal chances for promotion. Therefore, small company managers should desist from favoring any one employee, for it can lead to lawsuits and is also highly counterproductive.
- **Communication of the rules and regulation to all employees:** Company policies must be clearly communicated to each employee with a transparency at all levels of the hierarchy. Employees are the spine of all organizations and should have a say in the goals and objectives of a firm.
- **Respect for Employees:** Respect employees and in return receive the same. Regulations should not be so rigid, and therefore, don't expect staff to attend work two days before a marriage. If somebody is not well, don't ask them to attend office unless or until there's an emergency.
- **Allow a degree of freedom to employees without constant micro-management:** Key roles of responsibility need to be established on the first day of joining with responsibilities commensurate with a person's expertise. Employees should be inducted into training if needed.
- **Clear cut salary and promotion policy:** Employees crib if they are underpaid. Make sure they get what is deserved and decided in the presence of the person. A major attrition factor is a poor appraisal, promotion prospects are ideally based on merit, not favor. Clarity is crucial.
- **Clear and uniform holiday schedule:** It is the responsibility of human resource professionals to prepare the holiday calendar at the beginning of the year and circulate the same among all employees.
- **Effects of Work Ethics within an organization**: Preferably a workplace ethic culture will ensure that employers guide and mentor staff appropriately while management treats all as equal. Transparency is essential.
- **How Leadership ethics and Employee ethics can impact the organization:** Owner and executive level accountability is a vital function of leadership.

Executives, as equally as employees, are expected to be honest and transparent. Organizations need to abide by ethical norms; all of which benefit the consumer, the society and the firm.

- **What are the core ethical elements that define the ethics of an organization:** There are at least four elements that aim to create an ethical behavioral culture of employees within an organization.
    - A written code of ethics and standards (ethical code).
    - Ethics training for executives, managers, and employees.
    - The availability of ethical situational advice (i.e. advice lines or offices).
    - A confidential reporting system.

How to develop strong work ethic:

The employment market is now so competitive that if one doesn't have a positive work ethic, then employers do not bat an eyelid about looking for someone who meets their firm's requirement.

As a positive work ethic is vital to a business success, then each person from the CEO to new staff, must inculcate this to keep the company functioning optimally. Get to work promptly, arriving late always starts a workday badly, and signals that you are not committed. Take into consideration traffic, weather and so on and leave home to reach on time. Take responsibility for your actions, which includes being punctual.

Step 1: Be professional about your work

Professionalism is beyond a clean shirt, for it includes one's values, attitude, and demeanor. Practice being cordial and positive while refraining from gossip. Knowing how to communicate constructively and positively, while respecting the feelings of others is an invaluable tool. Respect others and develop a reputation for having integrity, meaning honesty, fairness, and consistency in what you do and say.

Reliability and honesty: Work ethic is more than completing long hours for its foundation is integrity. To develop integrity, one can:

- Act the same when people are not watching you, as when they are.
- Perform consistently at the same level of quality. Be conscientious. Be honest in all things.

Honesty isn't a business policy, it is a state of mind.

Deliver best outputs: A work ethic is fundamental to success at anything, plus it makes you a valuable employee. For career advancement this is more important than ever before. In work assignments strive to exceed expectations by paying attention to details and making the quality of work your central priority. Everyone can work fast, but few will deliver best quality outputs with few mistakes.

Keep everything in an organized method like a good file system for documents (both soft and hard copy), so you can retrieve these easily to get on with the essential tasks. All of us have times when we are more productive, some in the early morning, some later at night. Identify and schedule the difficult work to be completed in those periods.

Be consistent in delivering good quality work and earn good reputation: Everything worthwhile accomplishing requires discipline. Remain focused on a long-term goal while avoiding getting side-tracked by a short-term gratification. To be persistent and able to follow through on assignments… Train yourself.

However productive you may be, there is always an opportunity to increase one's level of quality work. Effectiveness means doing the work that matters. Be effective first, then become efficient. Efficient is achieving improved output in less time. There is no point in becoming efficient at doing that non-value added work.

Step 2: Manage your time

Know your strength and weaknesses (including potential distractions, so you can avoid them): Evaluate work. Identifying one's weaknesses and making a plan to improve these areas builds a stronger work ethic. One way of evaluating this is to create a list summarizing the skills and requirements of your work, and the strengths and weaknesses. Be honest about weaknesses, and what it is that distracts you – this is step one in learning to manage those weaknesses.

Distractions are everywhere – Twitter, Facebook, TV, mobile, etc. Complete these before arriving at work for a no-distraction period. Turn off the internet and see how you start doing work in due time. Ditch the unimportant. If the work is nice-to-do but not need-to-do. Stop it.

Accelerate becoming a more productive employee by regularly visualizing yourself as channeled toward higher accomplishments. Vision yourself as highly efficient and feed the subconscious mind with this vision until it is accepted as a command. The individual that you ''vision", is the individual that you "become". Lastingly successful people have one common denominator: they focus on strengths and manage around any weaknesses

Set yourself deadlines for delivering even small tasks: Being able to complete your tasks and finish what you start, is an essential part of character building. You cannot imagine a fully mature, fully functioning person who is unable to finish what she begins. The development of this habit is the key to long-term success. Don't waste time by doing stuff that is not important. Constantly evaluate to check which things absolutely must get done.

Prioritize tasks and set the most important ones in the morning: Complete projects and tasks immediately. A trademark behavior of a worker with a poor work ethic is delaying work until another day, which usually only leads to an incomplete or late project.

Avoid procrastination: Procrastinating is a great waste. Imagine all that could be accomplished by eliminating procrastination from this moment on. To overcome procrastination, first realize that it's not the real issue. Procrastination, laziness, bad time management, or lack of discipline, are merely symptoms of the issue. The real reason is beneath this. You can also use the Pomodoro technique to avoid procrastination.

Avoid negative talk and gossip: Keep the lazy, the negative minded, and the unproductive, at arm's length, for it's a psychological prison. Associate with ambitious, hard-working people, and soon count yourself amongst them.

- Provide feedback that improves situations and builds people up.
- Be an active listener and keep an open mind.

Step 3: Keep a balance and deliver consistent high performance work

Do sport, sleep well, and socialize: Play is best when it's earned, equally sleep. Earn sleep by working hard on one's goals in the day. A good work ethic isn't just being glued to a computer. It is also understanding how to take care with decent sleep, and eating nutritiously. Take time to relax and recharge while keeping priorities in your life clear, helps maintain a good perspective at work.

Step 4: Develop good work habits

Steer the self-development path towards choosing to be an employee with a strong ethic, after all, creating a habit for oneself is really a question of being an action-minded person. The 'doing component' flows easily when embracing the 'being part.'

Create and learn habits: Values to inculcate and habitualize:

- Valuing punctuality and attendance.
- Valuing time, orderliness, neatness, and speed.
- Working smarter but not harder; being psychologically self-employed.
- Playing an internal game of working, yet enjoying the importance of relaxation and rest.

"Do it now" habit: Never leave 'till tomorrow what can be accomplished today.' Good ethics habitualize both attitude, action, and inevitably – consequence: how you do, what you do this moment.

- The initiative habit – positivity.

- The main cause of poor productivity and self-sabotage is procrastination, for many reasons, including the perceptions that a task is unpleasant, may lead to negative consequences, or is overwhelming.
- Cultivate flexibility.

"Do it right" habit: A disciplined habit makes a difference in the long term. Don't try to break bad habits. Alternatively, choose preferable substitutes that you move forward to, in place of the old ones.

Other good habits:

Concentration is the ability to stay on a task until it is completed, by working in a straight line to get from where one is, without distraction or diversion, to the destination, i.e., completion of the work.

- Get off to a good start.
- Clean up and get organized.
- Plan activities.
- Streamline work and emphasize the important work.
- Concentrate on one work task at a time until completion.
- Work steadily.
- Make smart use of technology.
- Be in control of office paper, work in-basket, and e-mail.
- Multitask on routine matters.
- Make better use of time.

Core elements of a strong work ethic:

It is difficult to define the elements of good work ethics, as it is such an individualistic approach and thinking. What may be good work ethics for me may not be the same for you. Much depends upon how each organization or person looks at work ethics and the moral values that each follows. What moral values you practice in daily life will define your attitude towards work and your work ethics. But there are a few common elements that are universally followed and employers look for it in their employees.

- **Honesty**: This is the core element of work ethics, all the other elements are based upon your honesty. Be honest about your successes and failures, take credit only where due, do not steal other's works or ideas, and own up to your failures.
- **Integrity**: Do not let people down, try to fulfill your commitments, and be consistent in your thoughts, action and behavior.
- **Impartiality/Fairness**: Be fair to all, do not practice favoritism. Treat everyone as equals.
- **Alertness**: Be aware of what is happening around and keep an eye on things.

- **Openness**: Share your ideas, results and resources with the other team members, so that everyone has the same opportunity and know what you are doing. Being secretive is counterproductive.
- **Respect for others**: No matter how urgent a deadline or heated that tempers become, remain diplomatic and poised and show grace under pressure. Whether serving a client, meeting a customer or meeting with management, do the best to respect other's opinions, even in stressful circumstances. It shows one values other's individual worth and professional contribution.
- **Reliability and Dependability**: Means being punctual for work and meetings, delivering assignments within budget and on schedule. Be reliable about keeping promises for reputation precedes one so that clients, customers, and colleagues do trust in you to do all that you say you will – everyone appreciates the stability this embodies.
- **Determination**: Obstacles cannot stop you as they are a challenge to be overcome. Embrace challenges positively and know that your role is to solve problems with purpose and resilience. Push on, no matter how far it is necessary to go.
- **Dedication:** Continue until the job is complete, and delivered. "It's good enough" is not sufficient for you and the team, as you aim to be "outstanding" in content and quality. Put in the extra hours to get things right by attending to detail and excellence.
- **Accountability:** Accept responsibility personally for one's actions and outcomes in all situations, plus avoid excuses when work does not proceed as planned – admitting mistakes or oversights are used as a learning curve and will not be repeated again. Employers expect employees to attain to high standards, and they should fully support staff who accept responsibility, instead of passing the buck.
- **Confidentiality**: Any confidential information of documents you have should remain confidential. You cannot discuss it or show it to anyone else, other than the people authorized to do so.
- **Responsibility**: Take responsibility for your thoughts, actions, behavior and work.
- **Legality:** Always work within the legal boundaries, do not break or twist the law to fit your agenda.
- **Competence**: Improve your performance and competence by constantly learning and including the new learning into your work.
- **Professionalism**: From how one dresses and presents oneself in the business world, to how others are treated, professionalism is such a very broad category that it encompasses all the elements of a work ethic.
- **Humility**: Acknowledge other's contribution, and share credit for successes. You have integrity and are open to learning from mentors and others, even as

you teach via your action, example, and words. Though you take the work seriously, you are also maintaining a sense of humor about yourself.

- **Initiative**: Do not be afraid to put forth your ideas or volunteer for work.

These days a work ethics is important in many situations. It is a skill that can be learned by every person and has so often proved to be the path of success for many. All businesses give a higher regard to an ethical employee, and hiring staff with positive ethics is appreciated around the world.

Simply stating that "I have a good work ethic" is not the way to demonstrate it to an employer. Don't provide generic, wishy-washy utterings, allow the employer to visualize your ethic by defining how they are incorporated in your accomplishments, without condition.

1.8 SERVICE LEARNING

Service-learning refers to learning that actively involves students in a wide range of experiences, which often benefit others and the community, while also advancing the goals of a given curriculum.

Community-based service activities are paired with structured preparation and student reflection. What is unique about service learning is that it offers direct application of theoretical models. Proponents of academic service learning feel that the real-world application of classroom knowledge in a community setting allows students to synthesize course material in more meaningful ways. Common goals achieved by service learning include: gaining a deeper understanding of the course/curricular content, a broader appreciation of the discipline and an enhanced sense of civic responsibility.

Qualities of service-learning:

1. Integrative
2. Reflective
3. Contextualized
4. Strength-Based
5. Reciprocal
6. Lifelong

1. Integrative: The service-learning experience goes beyond traditional ideas of classroom learning, practicum training or off-campus volunteering. Service-learning holistically integrates class learning objectives, faculty guidance, as well as community perspective and priorities. When engaged in genuine service students participate as both learners and community members. Students demonstrate success both academically and interpersonally.

2. Reflective: "The process of reflection is a core component of service-learning. Service-learning practitioners and researchers alike have concluded that the most effective service-learning experiences are those that provide 'structured opportunities' for learners to critically reflect upon their service experience. Structured opportunities for reflection can enable learners to examine and form the beliefs, values, opinions, assumptions, judgments and practices related to an action or experience, gain a deeper understanding of them and construct their own meaning and significance for future actions."

3. Contextualized: Service-learning provides students a unique opportunity to access knowledge and expertise that resides in the context of community. There is opportunity to connect the knowledge of a discipline, as explored in class, to the knowledge in practice, as evidenced in communities. Learning experiences in community settings immerse students in the unpredictable and complex nature of real world situations. Working alongside community members and experienced professionals, the opportunity to construct learning and responses can be immediate and uncontrived.

4. Strength-based: Service-learning draws upon existing community strengths and resources, and honors community members and organizations as co-educators of students. Communities are never built from the outside in. A strength-based approach focuses on the capacity and expertise that exist in every community, rather than on what is absent. By shifting away from a deficit mentality, students learn partnership strategies to identify and develop each community's unique strengths.

5. Reciprocal: The service-learning relationship offers all parties involved some measure of benefits; it is a two way street. Students give time, talent and intellectual capital in order to gain deeper understanding of course material and the nuanced nature of social issues. Course instructors modify their teaching practice to include service-learning and are rewarded with deeper student engagement of course material. Community members and organizations invest time as co-educators and in turn accomplish more toward their mission and goals through the work of students.

6. Lifelong: Service-learning is learning that sticks. By synthesizing theory and practice, this educational method provides a distinctive, meaningful and influential life experience. Students build relationships, solve problems, value a sense of community and gain self-awareness. Service-learning is beyond memorable; it can influence one's career path and enhance civic responsibility. Service-learning extends learning beyond the academic term; it lays the foundation for continual personal growth throughout the student's academic experience and beyond.

Student Benefits of Social Learning:

Learning Outcomes

- Positive impact on students' academic learning
- Improves students' ability to apply what they have learned in "the real world"
- Positive impact on academic outcomes such as demonstrated complexity of understanding, problem analysis, problem-solving, critical thinking, and cognitive development
- Improved ability to understand complexity and ambiguity

Personal Outcomes

- Greater sense of personal efficacy, personal identity, spiritual growth, and moral development
- Greater interpersonal development, particularly the ability to work well with others, and build leadership and communication skills

Social Outcomes

- Reduced stereotypes and greater inter-cultural understanding
- Improved social responsibility and citizenship skills
- Greater involvement in community service after graduation

Career Development

- Connections with professionals and community members for learning and career opportunities
- Greater academic learning, leadership skills, and personal efficacy can lead to greater opportunity

Relationship with the Institution

- Stronger relationships with faculty
- Greater satisfaction with college
- Improved graduation rates

Faculty Benefits of Service Learning

- Satisfaction with the quality of student learning
- New avenues for research and publication via new relationships between faculty and community
- Providing networking opportunities with engaged faculty in other disciplines or institutions
- A stronger commitment to one's research

College and University Benefits of Service Learning

- Improved institutional commitment to the curriculum
- Improved student retention

- Enhanced community relations

1.9 CIVIC VIRTUE

Civic virtue is morality or a standard of righteous behavior in relationship to a citizen's involvement in society. An individual may exhibit civic virtue by voting, volunteering, organizing a book group, or attending a PTA meeting.

Civic virtue is the harvesting of habits important for the success of the community. Closely linked to the concept of citizenship, civic virtue is often conceived as the dedication of citizens to the common welfare of their community even at the cost of their individual interests. The identification of the character traits that constitute civic virtue has been a major concern of political philosophy. The term *civility* refers to behavior between persons and groups that conforms to a social mode (that is, in accordance with the civil society), as itself being a foundation of society and law.

Most discussions of civic virtue centre on the obligation of citizens to participate in society by performing the minimally necessary activities in support of the state, such as paying taxes. However, political theorists agree that the sum total of a person's well-being is not solely attributable to his or her own talents but is a product of social cooperation, or civic virtue. Even those who take a less-demanding view recognize that in a radically individualistic society, all people benefit from publicly supported goods, such as a transportation infrastructure or schools. To promote cooperation, Aristotle argued that civic virtue involved citizens taking part in ruling and being ruled. Others have highlighted the essential virtues of justice, courage, or honesty. However, specifically what counts for civic virtue depends on the kind of political order one aspires to create.

To illustrate the centrality of the state's purpose in civic virtue, it is useful to compare two dominant political traditions: the liberal and civic republican traditions. The liberal tradition makes minimal demands of citizens, on the assumption that pursuing one's interests in the private sphere is more important than living a public life. It is sufficient under the liberal tradition for citizens to vote. The republican tradition demands that citizens be active, on the assumption that high levels of civic engagement are necessary to protect against government abuses and to provide citizens with an outlet to satisfy their human yearning of creating a shared public good. Both the liberal and republican traditions share the view that civic virtue is not an inherent human quality but needs to be developed.

1.10 RESPECT FOR OTHERS

Respect, also called **esteem**, is a positive feeling or action shown towards someone or something considered important, or held in high esteem or regard. It conveys a

sense of admiration for good or valuable qualities. And it is also the process of honoring someone by exhibiting care, concern, or consideration for their needs or feelings.

Some people may earn the respect of individuals by assisting others or by playing important social roles. In many cultures, individuals are considered to be worthy of respect until they prove otherwise. Courtesies that show respect may include simple words and phrases like "Thank you" in the West or "*Namaste*" in the Indian subcontinent, or simple physical signs like a slight bow, a smile, direct eye contact, or a simple handshake; however, those acts may have very different interpretations, depending on the cultural context.

How to Respect Others:

1. Listening to the other person.
2. Being empathetic, understanding each other and putting ourselves in their shoes.
3. Using assertive communication, that is, defending our rights while respecting the rights of others, in an educated and non-aggressive manner.
4. Keep in mind that our approaches, ideas, and opinions may differ from other people and none is wrong. No one has the absolute truth.
5. Apologizing to each other when we make mistakes.
6. Keeping other people's secrets.
7. Complying with and respecting laws and regulations
8. Taking care of the common spaces and the environment.
9. Interest in others, their everyday life and how they feel.
10. Respecting the privacy and intimacy of others.
11. Respecting others spaces and belongings, not to invade or use what is not ours without permission.
12. Respect personal space.
13. Make sure we include rather than exclude others.
14. Helping others when it is in our power to do so.
15. Being grateful.

1.11 CARING AND SHARING

Caring is the essence of moral life. Caring includes feelings, relationship, contends with other persons and protecting others and causing least damage to others. Sharing means sharing of feelings, ideas thoughts, resources and profits. Sharing is always mutually beneficial. Sharing morally acceptable feelings, resources and materials is a value.

Caring

Caring is feeling for others. It is a process which exhibits the interest in, and support for, the welfare of others with fairness, impartiality and justice in all activities, among the employees, in the context of professional ethics. It includes showing respect to the feelings of others, and also respecting and preserving the interests of all others concerned. Caring is reflected in activities such as friendship, membership in social clubs and professional societies, and through various transactions in the family, fraternity, community, country and in international councils.

In the present day context, caring for the environment (including the fauna and flora) has become a necessity for our very survival. If we do not care for the environment, the environment will scare us.

Sharing

Primarily, caring influences 'sharing'. Sharing is a process that describes the transfer of knowledge (teaching, learning, and information), experience (training), commodities (material possession) and facilities with others. The transfer should be genuine, legal, positive, voluntary, and without any expectation in return. However, the proprietary information it should not be shared with outsiders. Through this process of sharing, experience, expertise, wisdom and other benefits reach more people faster. Sharing is voluntary and it cannot be driven by force, but motivated successfully through ethical principles.

In short, sharing is 'charity' For the humanity, 'sharing' is a culture. The 'happiness and wealth' are multiplied and the 'crimesand sufferings' are reduced, by sharing. It paves the way for peace and obviates militancy. Philosophically, the sharing maximizes the happiness for all the human beings. In terms of psychology, the fear, divide, and distrust between the 'haves' and 'have-nots' disappear. Sharing not only paves the way to prosperity, early and easily, and sustains it. Economically speaking, benefits are maximized as there is no wastage or loss, and everybody gets one's needs fulfilled and satisfied. Commercially speaking, the profit is maximized. Technologically, the productivity and utilization are maximized by sharing.

In the industrial arena, code-sharing in airlines for bookings on air travels and the common Effluent Treatment Plant constructed for small-scale industries in the industrial estates, are some of the examples of sharing. The co-operative societies for producers as well as consumers are typical examples of sharing of the goods, profit and other social benefits. Here is an anecdote that illustrates the benefits of sharing, for the young minds! The shouting...the screaming…the fighting. That was the breaking point for me as I poured out my woes to my mother. "How can I get them to share as well as we did as kids?", I pleaded. Laughter was her reply. "Well, thanks a lot, mom," I said. "I'm sorry," she chuckled, "but you didn't always share." She

went on to explain about the "Box of Misbehaved Toys." Every time we fought over a toy, she would quietly take that and put it into the box. Yes, I did remember that box. I also remember it wasn't always fair since one person may have caused all the commotion. But my mother was consistent. No matter what the reason for the struggle was, the toy disappeared into the box for one week. No questions asked, and no chance of parole. My siblings and I soon learned that sharing a toy was better than losing it. Often, one person would decide to just wait for a time when no one else was playing with the toy, rather than fight and lose it. It was not a perfect system, but I tried it anyway That box was a shock to my kids and it was close to full, within a few days…..As the weeks progressed, I noticed the box was emptier and the arguing was less. Today, I heard quiet music to my ears as my son said to his sister, "That's OK, you can play with it." This story illustrates the worthy joy of sharing as compared to the pain of losing.

1.12 HONESTLY

Honesty is speaking the truth. Saying things that aren't true, or that you think might not be true, or that you are making up to hide the truth are all types of lies. Lying is not honest (also called being dishonest) because you are saying something that isn't true.
Examples of what speaking the honest truth means:

- Honesty means you don't say things about people that aren't true. You are not being honest if you make up rumors about someone or if you share rumors someone else made up.
- Being honest means you admit to your actions, even if you'll get in trouble. You are not being honest if you deny you did something wrong when you really did it.
- Honesty means you explain how a situation really happened. You are not being honest if you say something happened one way when it really happened another way.

When you do something you know is morally wrong, or when you have to hide your actions because you know they are wrong, you are not being honest. Being honest means you act in a way that you know is the right thing to do. This part of the definition of honesty includes not hiding the truth (deceiving), not breaking rules to gain an advantage (cheating), and not taking something that isn't yours (stealing) and any other action that you would hide because it is against what you consider morally right.

Honesty is a virtue, and it is exhibited in two aspects namely,

(a) Truthfulness and
(b) Trustworthiness.

Truthfulness is to face the responsibilities upon telling truth. One should keep one's word or promise. By admitting one's mistake committed (one needs courage to do that!), it is easy to fix them. Reliable engineering judgment, maintenance of truth, defending the truth, and communicating the truth, only when it does 'good' to others, are some of the reflections of truthfulness. But trustworthiness is maintaining integrity and taking responsibility for personal performance. People abide by law and live by mutual trust. They play the right way to win, according to the laws or rules (legally and morally). They build trust through reliability and authenticity. They admit their own mistakes and confront unethical actions in others and take tough and principled stand, even if unpopular.

Honesty is mirrored in many ways. The common reflections are:

(a) Beliefs (intellectual honesty).
(b) Communication (writing and speech).
(c) Decisions (ideas, discretion).
(d) Actions (means, timing, place, and the goals). and
(e) Intended and unintended results achieved.

As against this, some of the actions of an engineer that leads to dishonesty are:

1. Lying: Honesty implies avoidance of lying. An engineer may communicate wrong or distorted test results intentionally or otherwise. It is giving wrong information to the right people.

2. Deliberate deception: An engineer may judge or decide on matters one is not familiar or with insufficient data or proof, to impress upon the customers or employers. This is a self deceit.

3. Withholding the information: It means hiding the facts during communication to one's superior or subordinate, intentionally or otherwise.

4. Not seeking the truth: Some engineers accept the information or data, without applying their mind and seeking the truth.

5. Not maintaining confidentiality: It is giving right information to wrong people. The engineers should keep information of their customers/clients or of their employers confidential and should not discuss them with others.

6. Giving professional judgment under the influence of extraneous factors such as personal benefits and prejudice. The laws, experience, social welfare, and even conscience are given a go-bye by such actions. Certainly this is a higher-order crime.

1.13 LIVING PEACEFULLY

To live peacefully, one should start install peace within (self). Charity begins at home. Then one can spread peace to family, organisation where one works, and then to the world, including the environment. Only who are at peace can spread peace. You cannot gift an article which you do not possess. The essence of oriental philosophy is that one should not fight for peace. It is oxymoron. War or peace can be won only by peace, and not by wars! One should adopt the following means to live peacefully, in the world:

Nurture:

1. Order in one's life (self-regulation, discipline, and duty).
2. Pure thoughts in one's soul (loving others, blessing others, friendly, and not criticizing or hurting others by thought, word or deed).
3. Creativity in one's head (useful and constructive).
4. Beauty in one's heart (love, service, happiness, and peace).
5. Good health/body (physical strength for service).
6. Help the needy with head, heart, and hands (charity). Service to the poor is considered holier than the service to God.
7. Not hurting and torturing others either physically, verbally, or mentally.

The following are the factors that promote living, with internal and external peace:

1. Conducive environment (safe, ventilated, illuminated and comfortable).
2. Secured job and motivated with 'recognition and reward'.
3. Absence of threat or tension by pressure due to limitations of money or time.
4. Absence of unnecessary interference or disturbance, except as guidelines.
5. Healthy labor relations and family situations.
6. Service to the needy (physically and mentally-challenged) with love and sympathy.

1.14 COURAGE

Courage is the tendency to accept and face risks and difficult tasks in rational ways. Self-confidence is the basic requirement to nurture courage.

Courage is classified into three types, based on the types of risks, namely

(a) Physical courage,
(b) Social courage, and
(c) Intellectual courage.

In **physical courage**, the thrust is on the adequacy of the physical strength, including the muscle power and armaments. People with high adrenalin, may be prepared to

face challenges for the mere 'thrill' or driven by a decision to 'excel'. The **social courage** involves the decisions and actions to change the order, based on the conviction for or against certain social behaviors. This requires leadership abilities, including empathy and sacrifice, to mobilize and motivate the followers, for the social cause. The **intellectual courage** is inculcated in people through acquired knowledge, experience, games, tactics, education, and training. In professional ethics, courage is applicable to the employers, employees, public, and the press.

Look before you leap. One should perform Strengths, Weakness, Opportunities, and Threat (SWOT) analysis. Calculate (estimate) the risks, compare with one's strengths, and anticipate the end results, while taking decisions and before getting into action. Learning from the past helps. Past experience (one's own or borrowed!) and wisdom gained from self-study or others will prepare one to plan and act with self-confidence, succeed in achieving the desired ethical goals through ethical means. Opportunities and threat existing and likely to exist in future are also to be studied and measures to be planned. This anticipatory management will help anyone to face the future with courage.

Facing the criticism, owning responsibility, and accepting the mistakes or errors when committed and exposed are the expressions of courage. In fact, this sets their mind to be vigilant against the past mistakes, and creative in finding the alternate means to achieve the desired objectives. Prof. SathishDhawan, Chief of ISRO, was reported to have exhibited his courage and owned responsibility, when the previous space mission failed, but credited Prof. A.P.J. Abdul Kalam (now our revered President), when the subsequent mission succeeded.

The courageous people own and have shown the following characteristics, in their professions:

(a) Perseverance (sustained hard work),
(b) Experimentation (preparedness to face the challenges, that is, unexpected or unintended results),
(c) Involvement (attitude, clear and firm resolve to act), and
(d) Commitment (willing to get into action and to reach the desired goals by any alternative but ethical means).

1.15 COOPERATION

It is a team-spirit present with every individual engaged in engineering. Co-operation is activity between two persons or sectors that aims at integration of operations (synergy), while not sacrificing the autonomy of either party. Further, working together ensures, coherence, i.e., blending of different skills required, towards common goals. Willingness to understand others, think and act together

and putting this into practice, is cooperation. Cooperation promotes collinearity, coherence (blend), co-ordination (activities linked in sequence or priority) and the synergy (maximizing the output, by reinforcement).

According to professional ethics, cooperation should exist or be developed, and maintained, at several levels; between the employers and employees, between the superiors and subordinates, among the colleagues, between the producers and the suppliers (spare parts), and between the organisation and its customers.

The codes of ethics of various professional societies insist on appropriate cooperation to nourish the industry.

The absence of cooperation leads to lack of communication, misinformation, void in communication, and undue delay between supply, production, marketing, and consumption. This is likely to demoralize and frustrate the employees, leading to collapse of the industry over time and an economic loss to the society.

The impediments to successful cooperation are:

1. Clash of ego of individuals.
2. Lack of leadership and motivation.
3. Conflicts of interests, based on region, religion, language, and caste.
4. Ignorance and lack of interest.

By careful planning, motivation, leadership, fostering and rewarding team work, professionalism and humanism beyond the 'divides', training on appreciation to different cultures, mutual understanding 'cooperation' can be developed and also sustained.

1.16 COMMITMENT

Commitment means alignment to goals and adherence to ethical principles during the activities. One must believe in one's action performed and the expected end results (confidence). Holding sustained interest and firmness, in whatever ethical means one follows, with the fervent attitude and hope that one will achieve the goals, is commitment. It is the driving force to realize success.

Commitment means acceptance of the responsibilities and duties and cooperation means help and assistance. By developing team commitment and cooperation in a work team you are assisting the team to meet its goals and objectives. Work teams that are committed and cooperative are more likely to achieve the goals the business has set.

There are a number of signals that indicate the work team is committed.

These include:

- maintaining or increasing quality
- reaching or exceeding production targets
- decreasing complaints from team members
- limited conflict between team members
- fewer workplace injuries.

There are degrees of team involvement in decision making. Your knowledge of the skills and abilities of the team members will guide your decision about the extent supported employees can contribute to making a decision. There are no rules for when and how team members should be involved. It is a matter for your judgment. The following diagram shows the degrees of involvement team members may have. At the highest level of involvement the team identifies and solves problems, and brings recommendations to the supervisor. At the lowest level of involvement the team plays no role in the decision making at all. Between these two extremes the supervisor and team may make the decision together, or the supervisor may outline the problem and constraints for solving it (time, money, etc) and hand it over to the team to solve.

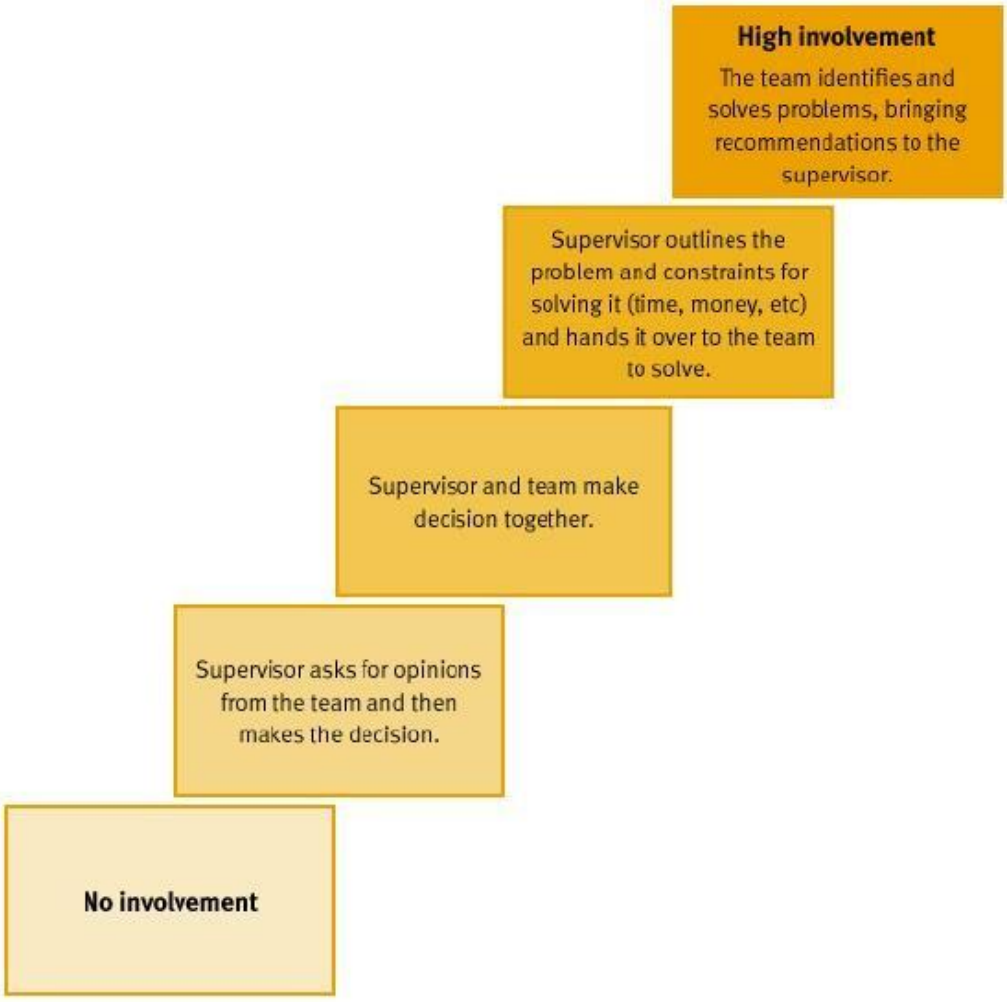

Figure 1.1 High involvement to no involvement

Involving team members in decision making, which can include problem solving, should be based on whether one or more of the following is met

- The need for acceptance. The greater the need for the team to accept your decisions, the more you should involve them.
- The effect the decision will have on the team. The more the problem or decision affects the team, the more you should involve them.
- Their involvement in implementing the decision. If the team will be implementing or carrying out the decision, involve them.
- The ability and desire of the group to become involved. If the team wants to be involved, consider involving them, particularly if they have sufficient knowledge or expertise in the issue involved. Even if they do not, it could be useful for training and development purposes.

1.17 EMPATHY

Empathy is social radar. Sensing what others feel about, without their open talk, is the essence of empathy. Empathy begins with showing concern, and then obtaining and understanding the feelings of others, from others' point of view. It is also defined as the ability to put one's self into the psychological frame or reference or point of view of another, to know what the other person feels. It includes the imaginative projection into other's feelings and understanding of other's background such as parentage, physical and mental state, economic situation, and association. This is an essential ingredient for good human relations and transactions.

To practice 'Empathy', a leader must have or develop in him, the following characteristics

1. Understanding others: It means sensing others feelings and perspectives, and taking active interest in their welfare.
2. Service orientation: It is anticipation, recognition and meeting the needs of the clients or customers.
3. Developing others: This means identification of their needs and bolstering their abilities. In developing others, the one should inculcate in him the _listening skill' first.

Communication = 22% reading and writing + 23% speaking + 55% listening

One should get the feed back, acknowledge the strength and accomplishments, and then coach the individual, by informing about what was wrong, and giving correct feedback and positive expectation of the subject's abilities and the resulting performance.

4. Leveraging diversity (opportunities through diverse people): This leads to enhanced organizational learning, flexibility, and profitability.

5. Political awareness: It is the ability to read political and social currents in an organization.

The benefits of empathy include:

1. Good customer relations (in sales and service, in partnering).
2. Harmonious labor relations (in manufacturing).
3. Good vendor-producer relationship (in partnering.)

Through the above three, we can maximize the output and profit, as well as minimizing the loss. While dealing with customer complaints, empathy is very effective in realising the unbiased views of others and in admitting one's own limitations and failures. According to Peter Drucker, purpose of the business is not to make a sale, but to make and keep a customer.

1.18 SELF-CONFIDENCE

Certainty in one's own capabilities, values, and goals, is self-confidence. Such people are usually positive thinking, flexible and willing to change. They respect others so much as they respect themselves.

Self-confidence is positive attitude, wherein the individual has some positive and realistic view of himself, with respect to the situations in which one gets involved. The people with self- confidence exhibit courage to get into action and unshakable faith in their abilities, whatever may be their positions. They are not influenced by threats or challenges and are prepared to face them and the natural or unexpected consequences.

The self-confidence in a person develops a sense of partnership, respect, and accountability, and this helps the organization to obtain maximum ideas, efforts, and guidelines from its employees.

The people with self-confidence have the following characteristics:

1. A self-assured standing,
2. Willing to listen to learn from others and adopt (flexibility),
3. Frank to speak the truth, and
4. Respect others' efforts and give due credit.

On the contrary, some leaders expose others when failure occurs, and own the credit when success comes.

The factors that shape self-confidence in a person are:

1. Heredity (attitudes of parents) and family environment (elders),
2. Friendship (influence of friends/colleagues),
3. Influence of superiors/role models, and
4. Training in the organization (e.g., training by Technical Evangelists at Infosys Technologies).

The following methodologies are effective in developing self-confidence in a person:

1. Encouraging SWOT analysis. By evaluating their strength and weakness, they can anticipate and be prepared to face the results.
2. Training to evaluate risks and face them (self-acceptance).
3. Self-talk . It is conditioning the mind for preparing the self to act, without any doubt on his capabilities. This make one accepts himself while still striving for improvement.
4. Study and group discussion, on the history of leaders and innovators (e.g., Sam Walton of Wal-Mart, USA).

1.19 SOCIAL EXPECTATIONS

Social expectations are ideas that we have of how someone in our social surroundings will behave in the future or in a specific situation. When we generate an impression of someone, these expectations are associated with the image we generate. This helps us imagine how we have to behave or act around them and to predict their behavior.

This conduct of generating expectations about our relationships fulfills an adaptive function. It's pretty simple to guess what it is. In an artificial environment, based on complex societies such as the ones most of us inhabit, foreseeing the behavior of others allows us to adapt our own behavior. Thus, we would greatly benefit in social interactions. Despite that this isn't a precise process, making a prediction and being wrong at times is better than not doing it or never guessing correctly.

It's important to know that these social or behavioral expectations greatly influence our own behavior. We don't treat everyone alike, just as we don't treat the same person the same way in every situation. We can see this in many everyday situations.

Plus, we try to make others meet our expectations, either by forcing them indirectly or altering our perception them. This process takes place in both directions. We are also aware of the expectations others have of us. So we also attempt to adapt our behavior in order to satisfy these ideas.

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MODULE 2: ENGINEERING ETHICS AND PROFESSIONALISM

Senses of Engineering Ethics - Variety of moral issues- Types of inquiry- Moral dilemmas –Moral Autonomy – Kohlberg's theory- Gilligan's theory- Consensus and Controversy-Profession and Professionalism- Models of professional roles - Theories about right action – Self interest -Customs and Religion- Uses of Ethical Theories.

2.1 INTRODUCTION

Ethics in engineering is the ability as well as responsibility of an engineer to judge his decisions from the context of the general wellbeing of the society. It is the study of moral issues that confront engineers and engineering organizations when some crucial decisions are taken. Engineering research and practice requires that the task being performed considers all the pros and cons of a certain action and its implementation. Professional engineering bodies like, IEEE, ASME, IEI etc., have evolved comprehensive ethics codes relevant to their respective professions, based on the rich experience of their members. Independent organizations like NSPE have prepared value based ethical codes applicable to all engineering professions.

Ethical standards in engineering are influenced by many factors: 1. Engineering as an experimentation for the good of mankind is a notable factor involving far reaching consequence, 2. Ethical dilemmas make engineering decisions relatively difficult to make. 3. Risk and safety of citizens as a social responsibility is a prime concern of an engineer, 4. Technological advancement can be very demanding on the engineering skill in the global context, 5. Moral values and responsible conduct will play a crucial role in decision making.

Professional ethics:

Profession is a commitment to a designated and organized occupation by virtue of being an authority over a body of knowledge with requisite skills acquired through

specialized training. An occupation becomes a profession when a group of people sharing the same occupation work together in a morally acceptable way with members setting and following a certain ethics code. A professional is a practitioner belonging to a specific profession. Professional ethics, as opposed to personal values and morality, is a set of ethical standards and values a practicing engineer is required to follow. It sets the standards for professional practice, and is only learned in a professional school or while practicing ones own profession. Today, it is an essential part of professional education because it helps students deal with issues they will face.

The scope of professional ethics envelopes diverse activities like

1. Engineering as a social experimentation
2. Engineers responsibility for safety3. Role of engineers, managers, consultants etc.
4. Rights of engineers
5. Moral reasoning and ethical theories
6. Responsibility to employers
7. Global issues and concerns

Professional Codes of Ethics:

A code of ethics prescribes how professionals are to pursue their common ideal so that each may do the best at a minimal cost to oneself and those they care about. The code is to protect each professional from certain pressures (for example, the pressure to cut corners to save money) by making it reasonably likely (and more likely then otherwise) that most other members of the profession will not take advantage. A code is a solution to a coordination problem. A professional has obligations to the employer, to customers, to other professionals- colleagues with specific expectations of reciprocity.

2.2 SENSES OF ENGINEERING ETHICS

The word ethics has different meanings but they are correspondingly related to each other. In connection with that, Engineering ethics has also various senses which are related to one another.

There are two different senses (meanings) of engineering ethics, namely the Normative and the Descriptive senses. The normative sense includes:

(a) Knowing moral values, finding accurate solutions to moral problems and justifying moral judgments in engineering practices,

(b) Study of decisions, policies, and values that are morally desirable in the engineering practice and research, and

(c) Using codes of ethics and standards and applying them in their transactions by engineers. The descriptive sense refers to what specific individual or group of engineers believe an act, without justifying their beliefs or actions.

Table 2.1 Comparison of the senses of Ethics and Engineering Ethics

Ethics	Engineering Ethics
Ethics is an activity which concerns with making investigations and knowing about moral values, finding solutions to moral issues and justifying moral issues and justifying moral judgments.	Like the ethics, engineering ethics also aims at knowing moral values related to engineering, finding accurate solutions to the moral problems in engineering and justifying moral judgments of engineering.
Ethics is a means of contrasting moral questions from non-moral problems.	Engineering Ethics gives a total view of the moral problems and how to solve these issues specifically related to engineering field.
Ethics is also used as a means of describing the beliefs, attitudes and habits related to an individual‟s or group‟s morality. Eg. : Ethics given in the Bhagavat Gita or the Bible or the Quran.	Engineering ethics is also using some currently accepted codes and standards which are to be followed by group of engineers and engineering societies.
As per the definition of dictionaries – “moral principles” is about the actions and principles of conduct of the people. i.e. ethical or unethical.	Engineering ethics also concerns with discovering moral principles such as obligation, rights and ideals in engineering and by applying them to take a correct decision.

2.3 VARIETY OF MORAL ISSUES

The word morality is concerned with:

- What morally ought or ought not to be given in a given situation;

- What is morally right or wrong an out the handling of the situation; and/or
- What is morally good or bad about the people, policies, and ideals involved in it?

According to the Oxford dictionary, morality means principles concerning right and wrong or good and bad behavior. Moral reasons are required to support an act (or an ideal) to be called as morally right act (or an ideal is moral)

Approaches to engineering ethics:

There are two different approaches of engineering ethics.

1. **Micro-ethics:** this approach addresses typical, everyday problems that the engineers face in their professional life. In other words, micr-ethics describes ethical issues that may affect an engineer's professional and personal life.

2. **Macro-ethics:** this approach deals with all societal problems that engineers encounter during their career. In other words, macro-ethics discusses ethical issues concerning all societal problems that engineers might encounter.

Engineers carry out various activities and decision-making exercises involving technical, financial, managerial, environmental, and ethical issues. There are many situations and moral issues that cause professional disagreements among engineers.

The varieties of moral issues are:

1. **Organization oriented issues**
   - Being an employee to firm, the engineer has to work towards the achievement of the objectives of his/her organization.
   - Engineers have to give higher priority to the benefits of the organization than one's own benefits.
   - Engineers should be able to work collectively with colleagues and other members in order to achieve firm's goals.
2. **Clients or customers oriented issues**
   - As we know, the purpose of any business is to reach and satisfy the end users. Therefore the customers' requirements should be met.
   - In this regard, engineers have a major role to play in identifying the _customer voice', and incorporating the voice of the customer into the product design and manufacture.
   - Apart from engineering technicality issues, engineers also should face other moral and ethical issues with clients/customers.

3. **Competitors oriented issues**
   - In order to withstand in a market, engineers should produce things better than their competitors by all means.
   - But engineers should not practice cut-throat competition. They should follow certain professional behavior while facing their competitors.
   - Thus engineers should hold paramount the safety, health and welfare of the customers in the performance of their professional duties.
4. **Law, government and public agencies oriented issues**
   - The engineers should obey and voluntarily comply with all the governmental rules and regulations related to them.
   - They should also respect and honestly practice all other similar laws, policies, and regulations.
5. **Professional societies oriented issues**
   - The engineers should follow strictly the various codes of ethics by various professional societies such as National Society of Professional Engineers (NSPE), the Institute of Electrical and Electronics Engineers (IEEE), and American Society of Mechanical Engineers (ASME), in order to perform standard professional behavior.
   - Professional codes of ethics reflect basic ‗norms' of conduct that exist within a particular professional and provide general guidance relating to a variety of issues.
6. **Social and environmental oriented issues**
   - Since the works of engineers have a direct and vital impact on the quality of life for all people, the engineers should be dedicate to the protection of the public health, safety and welfare.
   - Also engineers need to be aware their role as agents of experimenters. They should have a united commitment in protecting the environment. They should not involve in any unethical environmental issues such as misusing scarce resources, and fouling environment.
7. **Family oriented issues**
   - As a human being and the member of a family, the engineers do have family obligations to take care the needs of their family members. But they should not take any decisions for their own benefits at the cost of public, clients, or employers.
   - Thus the above discussion explains how the ethical problems often

arise in the engineering profession.

2.4 TYPES OF INQUIRY

Inquiry means an investigation. Like general ethics, Engineering ethics also involves investigations into values, meaning and facts. These inquiries in the field of Engineering ethics are of three types.

1. Normative Inquiries
2. Conceptual Inquiries
3. Factual or Descriptive Inquiries

Normative Inquiries

These inquiries are mostly helpful to identify the values which guide the individuals and groups in taking a decision. These are meant for identifying and justifying some norms and standards of morally desirable nature for guiding individuals as well as groups. In most of the cases, the normative questions are given below:

1. How do the obligations of engineers protect the public safety in given situations?
2. When should an engineer have to alarm their employers on dangerous practices?
3. Whereare the laws and organizational procedures that affect engineering practice on moral issues?
4. Whereare the moral rights essential for engineers to fulfill their professional obligations?

From these questions, it is clear that normative inquiries also have the theoretical goal of justifying moral judgments.

Conceptual Inquiries

These are meant for describing the meaning of concepts, principles, and issues related to Engineering Ethics. These inquiries also explain whether the concepts and ideas areexpressed by single word or by phrases. The following are some of the questions of conceptual inquiries:

1. What is the safety and how it is related to risk?
2. What does it mean when codes of ethics say engineers should protect the safety, health and welfare of the public?
3. What is a "bribe"?
4. What is a "profession" and „professional"?

Factual / Descriptive Inquiries

These help to provide fact for understanding and finding solutions to value based issues. The engineer has to conduct factual inquiries by using scientific techniques. These help to provide information regarding the business realities such as engineering practice, history of engineering profession, the effectiveness of professional societies in imposing moral conduct, the procedures to be adopted when assessing risks and psychological profiles of engineers. The information about these facts provide understanding and background conditions which create moral problems. These facts are also helpful in solving moral problems by using alternative ways of solutions.

These types of inquiries are said to be complementary and interrelated. Suppose an engineer wants to tell a wrong thing in an engineering practice to his superiors, he has to undergo all these inquiries and prepare an analysis about the problem on the basis of moral values and issues attached to that wrong thing. Then only he can convince his superior. Otherwise his judgment may be neglected or rejected by his superior.

2.5 MORAL DILEMMAS

Moral dilemmas are situations in which two or more moral obligations, duties, rights, goods, or ideals come into conflict with each other. The crucial feature of a moral dilemma is that all the moral principles cannot be fully respected in a given situation. Also solving one moral principle can create two or more conflicting applications for a particular situation.

Causes of Moral Dilemmas:

Moral dilemmas are situations, mostly, due to the following three problems.

1. Problem of vagueness;
2. Problem of conflicting reasons; and
3. Problem of disagreement.

1. Problem of vagueness

Vague means not clearly expressed or perceived; not specific or exact. For a given situation, sometimes it is unclear to the engineers to apply the most appropriate moral considerations or principles. They may not know how and which moral

principles to be used in resolving a moral problem. This situation creates a typical moral dilemma.

Example: consider an engineer, starting a new assignment as quality inspector checking the incoming raw materials/spare parts from the suppliers. Supplier offers (on behalf of some festival, say, Deepavali) him an expensive DVD player as a gift. Now this situation is a moral dilemma. Because the engineer is unclear about: what to do?; whether to accept the gift or not?; whether the thing offered is a gift or a bribe?; will it create a conflict of interest? Thus the problem of vagueness i.e., unclarity causes a moral dilemma.

2. Problem of conflicting reasons

This is a situation where two or more moral problems conflicting each other, each of which seems to be correct. In other words, this is a situation where two or more moral obligations, duties, rigthts or ideals come into conflict with each other; independently each one is good and correct. But when they come together it is very difficult choice to choose the good one. This situation is another moral dilemma.

Example: let us examine the space shuttle challenger explosion, focusing on the dilemma faced by the engineering manager, bob lund. He had the following conflicts:

1. Launching the chelenger space shuttle despite there was an unknown probability that the shuttle would explode; which will kill all the persons on the board.
2. Postponing the launch, which may lead to loss of future contracts from NASA, the loss of job to many workers, etc.

Now, the job of Bob Lund is to make the best choice out of these two conflicts. At last, he chose to risk the launching of shuttle.

This situation is one of the good illustrations for the moral dilemma due to the problem of conflicting reasons.

3. Problem of disagreement

It is quite obvious that individuals and groups may have different views, suggestions, interpretations, and solutions on a moral problem in particular situations. This disagreement among individuals and groups on interpreting moral issues will create a situation of another moral dilemma.

Example: In most corporations, there are disagreements among managers regarding whether customer can be allowed to inspect their plants and procedures, as a confidence building measure.

Steps / Procedures in facing / confronting moral dilemma:

All the above said three problems pave the way for the need of several steps in resolving the moral dilemmas. All the steps are interrelated and they can also be used jointly.

1) Identifying the relevant moral factors and reasons: i.e. Finding solutions for (i) the conflicting responsibilities (ii) the competing rights and (iii) the clashing ideals involved.

2) Collecting and gathering all the available facts which are relevant to the moral factors while resolving.

3) Ranking the moral considerations or principles on the basis of importance as applicable to the situation. But sometimes it is not possible when the objective is to find a way to meet equally urgent responsibilities and to promote equally important ideals.

4) Considering alternative courses of action for resolving the problems and tracing the full implications of each. i.e. conducting factual inquiries.

5) Having talked with the colleagues, friend about the problem getting their suggestions and alternative ideas on resolving that dilemma and

6) Arriving at a careful and reasonable judgment or solution by taking into consideration of all important moral factors and reasons on the basis of the facts or truths. But it seems to be difficult.

2.6 MORAL AUTONOMY

Moral Autonomy is the philosophy which is self-governing or self-determining, i.e., acting independently without the influence or distortion of others. The moral autonomy relates to the individual ideas whether right or wrong conduct which is independent of ethical issues. The concept of moral autonomy helps in improving self-determination.

Moral Autonomy is concerned with independent attitude of a person related to moral/ethical issues. This concept is found in moral, ethical and even in political philosophy.

The moral autonomy is the ability to think critically and independently about moral issues and apply this moral thinking to situations that arise during the professional engineering practice. It is understood that an individual personality depends on the integration of his moral benefits and attitude. When one's labor and skills are sold, then it is an illusion to think that the person is not morally autonomous. As an experimenter, an engineer has to undergo an extensive and updated training to form his identity as a professional. There will be a personal involvement in one's work.

The magnitude of moral autonomy to be experienced by engineering is highly influenced by the attitude of company's managements. Where there is a treat for engineers' moral autonomy, then engineers can look for moral support from their professional societies and outside organization.

Moral Autonomy – Skills Needed:

- **Ability to relate the problems with the problems of law, economics and religious principles** − It is essential to have the ability to analyze a problem and finding the relation with the existing law or the topic of issue with the existing principles on that topic. The ability to distinguish between both of them and finding the moral reasons.

- **Skill to process, clarify and understand the arguments against the moral issues** − If the issue is against some moral values or the ethical values to be followed in the society, then clarity should be maintained about the differences and similarities. Both of these differences and similarities are to be judged based on why they are a matter of concern and in what aspect.

- **Ability to suggest the solutions to moral issues on the basis of facts** − If the moral issues are not fulfilling and needs to be, then the solutions are to be suggested according to the moral issues based on the facts and truths of the issue. These suggestions must be consistent and must include all the aspects of the problem. No partiality is to be allowed in any such aspect.

- **Must have the imaginative skill to view the problems from all the viewpoints** − After having known about the facts and illusions of the issue, a clear understanding is attained in viewing the problem in all kinds of viewpoints. This enables one to be able to suggest a proper alternative solution.

- **Tolerance while giving moral judgment, which may cause trouble** − When the whole analysis is made considering all the viewpoints of the issue, the final output might be or might not be pleasing to the persons involved. Hence while declaring the judgment or the decisions taken, a detailed description of the actions done should be given, while the actions ought to be done should be presented in a better way, to ensure others that the decisions have been taken without any partialities towards any party.

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Skills for Improving Moral Autonomy:

Moral autonomy reflects the concept of individuality. This relates to the idea of building one's self with the moral values one has while developing psychologically.

To have moral autonomy in all the aspects, one should have a lot of patience and interest. One should adhere to the basic principles of humanity and should be strict with the Don'ts he has in mind and liberal with his Do's. The kindness towards his fellow beings is also an important concept to be kept in mind. Inculcation of all these important qualities, enhances the skills of Moral autonomy in a person.

A Person must have adequate knowledge and understanding about the use of ethical language so as to defend or support his views with others. He must have better knowledge in understanding the importance of suggestions and better solutions while resolving moral problems and also about the importance of tolerance on some critical situations.

Above all, one must understand the importance of maintaining moral honesty and should be liberal to understand the human behavior under certain circumstances.

2.7 KOHLBERG'S THEORY

Lawrence Kohlberg was a professor at Harvard University during the early 1970s and was famous for his works on developmental psychology. He conducted many studies at Harvard's Center for Moral Development and proposed a theory on moral development which is popularly known as **Kohlberg's theory**.

His theory of moral development was dependent on the thinking of the Swiss psychologist **Jean Piaget** and the American philosopher **John Dewey**. He was also inspired by **James Mark Baldwin**. These men had emphasized that human beings develop philosophically and psychologically in a progressive fashion.

Lawrence Kohlberg's Theory:

Kohlberg proposed that people progress in moral reasoning based on their ethical behavior. He postulated this theory based on the thinking of younger children throughout their growing period as adults. He conveyed that younger children make judgment based on the consequences that might occur and the older children make judgment based on their intuitions.

He believed that there are **six stages** of moral development which are further classified into **three levels**. The following illustration shows the different levels.

The process being discussed here is about the judgment made by the **thinker** about the **protagonist** in a given situation. The steps of the thinking process show the moral development of the thinker.

Pre-conventional Level

This can be understood as the first level of moral thinking, which is generally found at Elementary school level. The thinker at this stage tends to think and behave based on the **direct consequences** that might occur. There are two sub-stages in this.

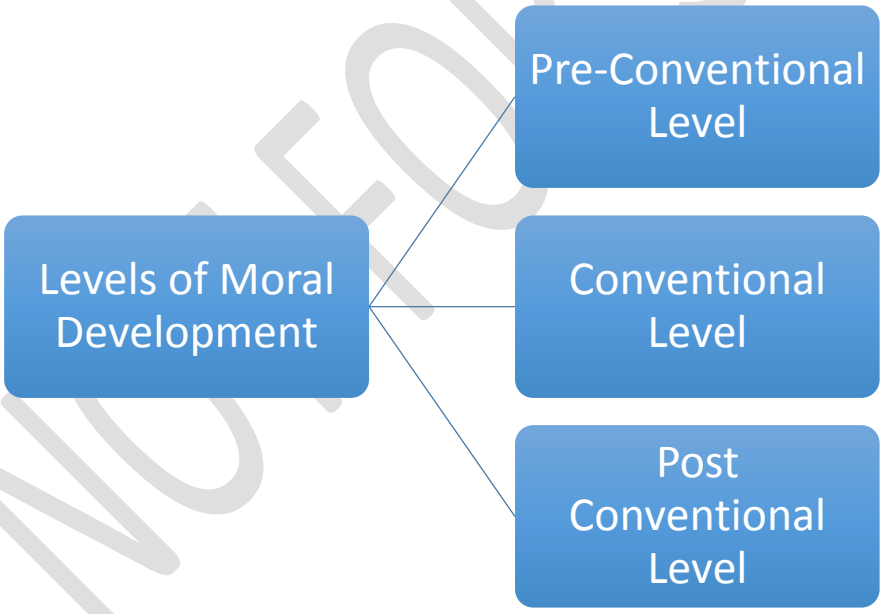

Figure 2.1 Lawrence Kohlberg's Theory

Avoid Punishments

A thinker at this stage generally thinks and believes that the judgment are to be made as per the socially acceptable norms as they are said so by some higher official (a teacher or a parent). This is a child-like obedience, in order to avoid punishments.

These thoughts are based on the idea that the protagonist should not disobey the law or rules.

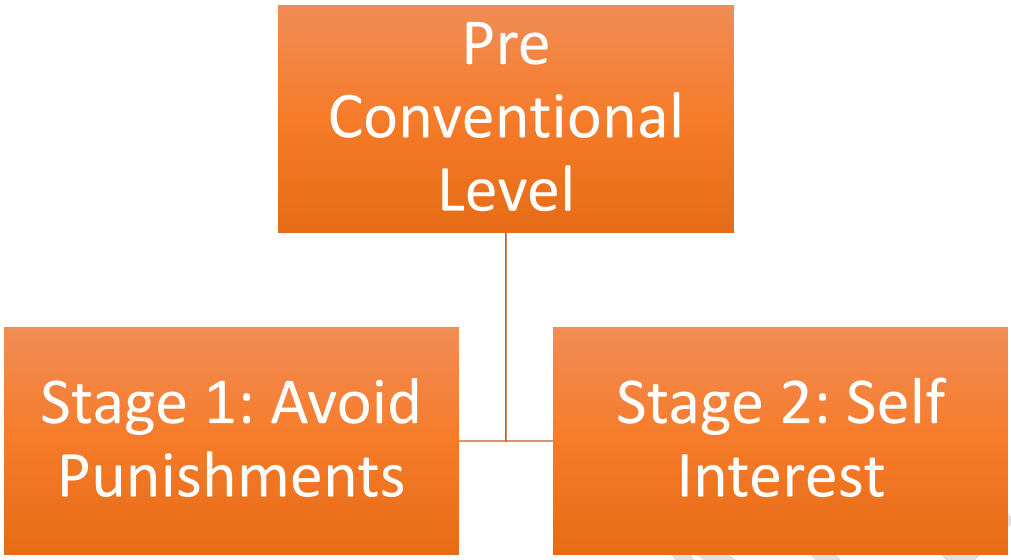

Figure 2.2 Pre-conventional Level

Self–interest

A thinker at this stage, shows interest in making decisions according to the rewards they get in exchange. This second stage is characterized by a view that right behavior means acting in one's own best interests.

In this stage, they tend to follow the rules of authority because they believe that this is necessary to ensure positive relationships and societal order.

Conventional Level

This can be understood as the second level of moral thinking, which is generally found at the primary and high school level. The thinker at this stage tends to think and behave based on the **want to please others**. There are two sub-stages in this.

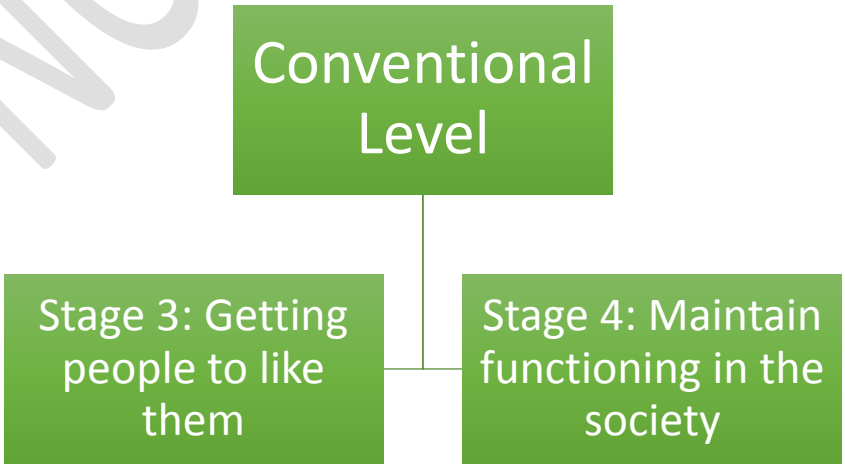

Figure 2.3 Conventional Level

Getting people to like them

At this stage, the ideas of the society are considered. This level can be that where the protagonist behaves on account of the moral grounds which people decide for decision making. This decision may or may not support the law. Whatever the result is, the thinking process is based on how to impress others or society and on how to please the people around.

Maintain functioning in society

A thinker at this stage, considers to follow the rules for the good of the society. The moral grounds on how people in the society will consider the job done will be the priority, because the thinker believes that a social order is maintained by abiding by the rules.

Hence a thinker sticks to the idea that the protagonist should follow the moral values. The thinker's behavior is driven by the authority while his thinking conforms to the social order.

Post-Conventional Level

This can be understood as the third level of Moral thinking, which is generally found after the high school level. The thinker at this stage tends to think and behave based on a **sense of justice**. There are two sub-stages in this.

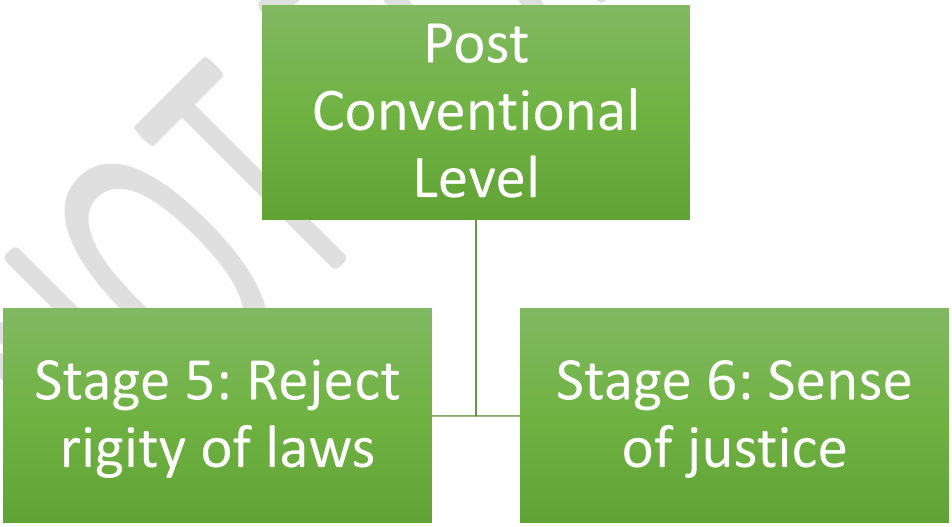

Figure 2.4 Post Conventional Level

Reject rigidity of laws

In this level, the thinker uses his moral thinking skills at a commendable pace. He starts to feel for the protagonist based on moral grounds. He also might have an opinion that the rules have to be changed according to humanitarian values. The thinker rejects the rigidity of the existing laws and rules at this stage.

Sense of justice

This is the pinnacle stage of Moral development where the thinker feels a sense of justice for the protagonist. The thinker has great moral values that he keeps himself free from the external factors that might influence his thinking process.

These are the three main sections of moral development proposed by Lawrence Kohlberg.

2.8 GILLIGAN'S THEORY

This is an advancement of Kohlberg's theory. It had been observed that Kohlberg's theory was proposed based on the moral thinking of privileged white men and boys. Hence this theory was popularized by taking both male and female thinking capabilities into account.

Carol Gilligan, a psychological theorist was born on Nov 28, 1936 in the New York city. She pursued her doctorate degree in Social Psychology from the Harvard University. Gilligan was a research assistant for Lawrence Kohlberg, but she eventually became independent and criticized some of his theories.

Gilligan's Theory:

Carol Gilligan opines that **Kohlberg's** theories are biased upon the **male thinking** process. According to Gilligan, Kohlberg seemed to have studied only **privileged men and boys**. She believed that **women** face a lot of psychological challenges and they are not moral widgets. The women's point of view on moral development involves **caring** which shows its effect on human **relationships**.

Hence she proposed a theory which has the same three stages of Kohlberg but with different stages of moral development.

Though the names of the stages are the same, the stages differ in this method. The moral development in Gilligan's theory are based on pro-social behaviors such as Altruism, caring and helping and the traits such as honesty, fairness and respect.

Pre-conventional Level

- A person in this stage cares for oneself to ensure survival.
- Though the person's attitude is selfish, this is the transition phase, where the person finds the connection between oneself and others.

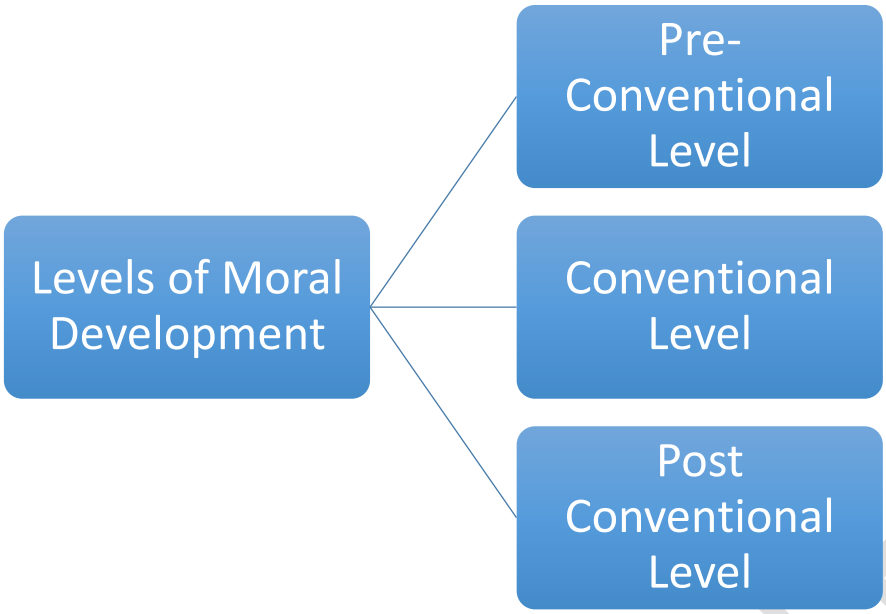

Figure 2.5 Gilligan's Theory

Conventional Level

- In this stage, the person feels responsible and shows care towards other people.
- Carol Gilligan believes that this moral thinking can be identified in the role of a mother and a wife. This sometimes leads to the ignorance of the self.

Post-conventional Level

- This is the stage, where the principle of care for self as well as others, is accepted.
- However, a section of people may never reach this level.

According to the Carol Gilligan's theory of moral development, changes occur due to the **change of self** rather than the **critical thinking**. It was stated that the post-conventional level of Kohlberg is not attained by women. But Carol Gilligan researched and found that the post-conventional level of thinking is not being easy for women to go through because they **care** for the relationships.

Levels of Thinking

Carol Gilligan states that the post-conventional level of moral thinking can be dealt based on the **two types of thinking**. Gilligan's theory is based on the two main ideas, the care-based morality (usually found in women) and the justice-based morality (usually found in men).

Care-based Morality

Care-based morality is the kind of thinking found in women. This is based on the following principles.

- More emphasis is given to inter-connected relationships and universality.
- Acting justly focuses on avoidance of violence.
- Women with this are usually interested in helping others.
- More common in girls because of their connections to their mothers.
- Because girls remain connected to their mothers, they are less inclined to worry about issues of fairness.

Justice-based Morality

Justice-based morality is the kind of thinking found in men. This is based on the following principles.

- They view the world as being composed of autonomous individuals who interact with one another.
- Acting justly means avoiding inequality.
- Individuals with this are usually interested in protecting individuality.
- Thought to be more common among boys because of their need to differentiate between themselves and their mothers.
- Because they are separated from their mothers, boys become more concerned with the concept of inequality.

The Carol Gilligan's theory can be better understood if explained with an example.

Example of Gilligan's Theory:

In order to understand Gilligan's theory, a popular example is usually considered. A group of moles give shelter to a porcupine. But they are being continuously stabbed by the porcupine's quills. Now, what should they do?

The **Pre-conventional** level of thinking states that to think for the good of oneself, either the moles or the porcupine only can live there. The other has to leave the place. According to the **Conventional** level of thinking, which brings a transition, from self to the good of others and which might even lead to sacrifice, either the moles or the porcupine has to sacrifice and again this leads to a stage where only moles or the porcupine can live in the burrow.

According to the **Post-conventional** level of thinking, which states that the good of both the parties has to be considered, both the moles and the porcupine come to an agreement that both will have separate places in the same burrow, where they limit to behave themselves and will not cause any trouble to other. This helps both of them to live in the same place with peace.



The researchers found that the solution to this scenario is different with different individuals; gender also plays an important role. The thinkers were observed viewing the problem in two different perspectives, the care-based and the justice-based.

In a **Justice-based perspective**, the solution to the problem is viewed as a conflict between two individual groups. Only one of them can have the property. Either moles or the porcupine will get the place in the burrow. Hence the solution to the dilemma, is not a resolution of the conflict, it is a verdict.

In a **Care-based perspective**, the approach differs. The problem is viewed as a difficult situation faced by both the parties together, rather than a fight between both of them. Hence the solution is sought in a way around the problem or to remove the problem completely. The solution may sound compromising but not damaging. The relationship will still be the same, after the resolution.

Researchers found that Justice-based perspective is pre-dominant among males while Care-based prospective is among females.

2.9 CONSENSUS AND CONTROVERSY

The moral judgment may lead to conflicts if they are not delivered properly without hurting the feelings of the persons involved. There are two stages after the judgement. The stages are described below −

Consensus:

This is that state where people come into agreement with the judgement given by getting convinced with the moral reasons. This will leave the persons with a feel that justice has been done, the verdict may favor any party.

Controversy

This is that state where the persons involved in an issue are not satisfied by the verdict and might feel that it was decided on partial interests. This will leave the people with a sense of dissatisfaction that justice was not done, which might lead to another conflict.

Literally, consensus means 'agreement ', and controversy means 'disagreement '.

2.10 PROFESSION AND PROFESSIONALISM

The words "Profession" and "Professionalism" are often referred in the moral issues.

Profession:

Profession means a job or an occupation, that helps a person earn his living. The main criteria of a profession involves the following.

- **Advanced expertise** − The criteria of a profession is to have sound knowledge in both technical aspects and liberal arts as well. In general, continuing education and updating knowledge are also important.
- **Self-regulation** − An organization that provides a profession, plays a major role in setting standards for the admission to the profession, drafting codes of ethics, enforcing the standards of conduct and representing the profession before the public and the government.
- **Public good** − Any occupation serves some public good by maintaining high ethical standards throughout a profession. This is a part of professional ethics

where each occupation is intended to serve for the welfare of the public, directly or indirectly to a certain extent.

Professionals

A person who is paid for getting onvolved in a particular profession in order to earn a living as well as to satisfy the laws of that profession can be understood as a Professional. The definition of a professional is given differently by different experts in the field. Let us see the following definitions −

- *"Only consulting engineers who are basically independent and have freedom from coercion can be called as professionals."* − **Robert L. Whitelaw**
- "Professionals have to meet the expectations of clients and employers. Professional restrains are to be imposed by only laws and government regulations and not by personal conscience." − **Samuel Florman**
- *"Engineers are professionals when they attain standards of achievement in education, job performance or creativity in engineering and accept the most basic moral responsibilities to the public as well as employers, clients, colleagues and subordinates."* - **Mike martin and Ronald Schinzinger**

Professionalism:

Professionalism covers comprehensively all areas of practice of a particular profession. It requires skills and responsibilities involved in engineering profession. Professionalism implies a certain set of attitudes.

The art of **Professionalism** can be understood as the practice of doing the right thing, not because how one feels but regardless of how one feels. Professionals make a profession of the specific kind of activity and conduct to which they commit themselves and to which they can be expected to conform. Moral ideals specify virtue, i.e., desirable feature of character. Virtues are desirable ways of relating to other individuals, groups and organizations. Virtues involve motives, attitudes and emotions.

According to Aristotle, virtues are the **"acquired habits that enable us to engage effectively in rational activities that defines us as human beings."**

Professional Ideals and Virtues

The virtues represent excellence in core moral behavior. The essentials for any professional to excel in the profession are behavior, skills and knowledge. The behavior shows the moral ideology of the professional.

The moral ideals specify the virtue, i.e., the desirable character traits that talk a lot about the **motives, attitude** and **emotions** of an individual.

- Public spirited virtues
- Proficiency virtues
- Team work virtues
- Self-governance virtues

The virtues mentioned above show the professional responsibility of an individual. Hence, the professionalism that comes in with these virtues is called **Responsible Professionalism**. Let us now understand each virtue in detail.

Public-spirited Virtues

An engineer should focus on the good of the clients and the public at large, which means no harm should be done intentionally. The code of professional conduct in the field of engineering includes avoiding harm and protecting, as well promoting the public safety, health and welfare.

Maintaining a sense of community with faith and hope within the society and being generous by extending time, talent and money to professional societies and communities, an engineer can maintain the public-spirited virtue. Finally, justice within corporations, government and economic practices becomes an essential virtue that an engineer should always possess.

Proficiency Virtues

These refer to the virtues followed in the profession according to the talent and intellect of an engineer. The moral values that include this virtue are competence and diligence. The **competence** is being successful in the job being done and the **diligence** is taking care and having alertness to dangers in the job. Creativity should also be present in accomplishing the assigned task.

Teamwork Virtues

These virtues represent the coordination among team members which means working successfully with other professionals. These include cooperative nature along with loyalty and respect towards their organization, which makes the engineers motivate the team professionals to work towards their valuable goals.

Self-governance Virtues

These virtues are concerned with moral responsibilities which represent integrity and self-respect of the person. The integrity actually means the moral integrity which refers to the actions, attitude and emotions of the person concerned during his professional period.

The self-governance virtues center on commitment, courage, self-discipline, perseverance, self-respect and integrity. The truthfulness and trustworthiness which represent his honesty are the crucial moral values to be kept up by a professional.

2.11 MODELS OF PROFESSIONAL ROLES (PROFESSIONAL ROLES TO BE PLAYED BY AN ENGINEER)

It is understood that an engineer has to play many roles while exercising his professional obligations. Some of the professional roles or models are given below:

1. **Engineers as Saviors**

It is believed that engineers hold the key for any improvements in society through technological developments. Thus some people consider engineer as a savior because they redeem society from poverty, inefficiency, waste and the hardships drudgery of manual labor.

2. **Engineers as Guardians**

Engineers know the direction in which technology should develop and the speed at which it should move. Thus many people agree the role of engineers as guardians, as engineers guard the best interests of society.

3. **Engineers as Bureaucratic Servants**

The engineers' role in the management is to be the servant who receives and translates the directives of management into solid accomplishments. Thus the engineers act as a bureaucratic servants i.e., loyal organizations set by the management.

4. **Engineers as Social Servants**

As we know, engineers have to play the role of social servants to receive society's directives and to satisfy society's desires.

5. **Engineers as Social Enablers and Catalysts**

Besides merely practicing the management 's directives, the engineers have to play role of creating a better society. Also they should act as catalysts for making social changes. Sometimes engineers have to help the management and the society to understand their needs and to make decisions about desirable technological development.

6. Engineers as Game Players

In actual practice, engineers are neither servants nor masters of anyone. In fact, they play the economic game rules, which may be effective at a given time. Like managers, the engineers' aim is also to play successfully within the organization and moving ahead in a competitive world.

2.12 THEORIES ABOUT RIGHT ACTION

An engineer with ethics is a person who is expected to possess the moral integrity with rich ethical values. The ethics are mainly divided into two categories depending upon the morality of humanity. They are −

Consequential Ethics

The Consequential ethics are values the outcome of which determine the morality behind a particular action. A lie which saves a life, comes under this.

Non-consequential Ethics

The non-consequential ethics are values followed where the source of morality comes from the standard values. The moral law which states that a lie is a lie, and shouldn't be done, though it ends in a good deed can be taken as an example of non-consequential ethics.

Types of Ethical Theories:

Depending upon the ethics a person is intended to follow, four theories were postulated by four different philosophers. These theories help to create the fundamentals of obligation suitable and applicable to professional and personal conduct of a person in his everyday life.

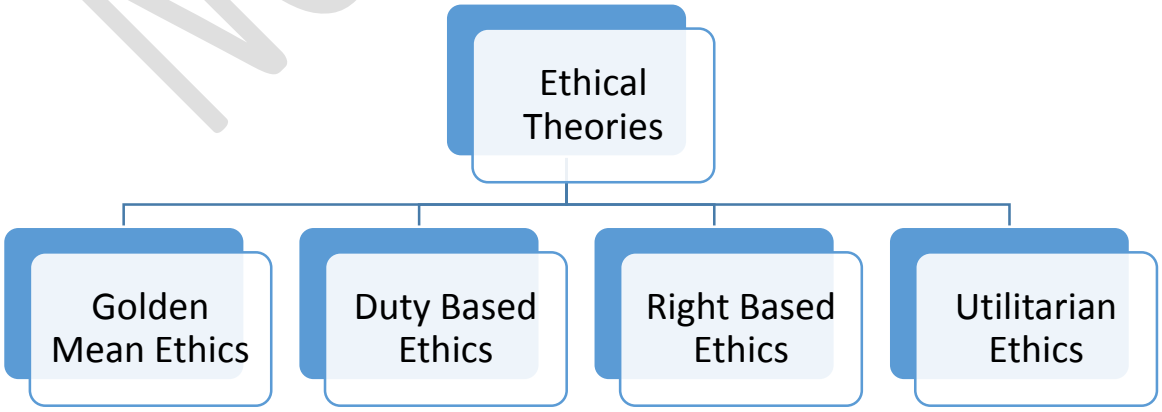

Figure 2.6 Ethical Theories

Golden Mean

The Golden Mean ethical theory was proposed by **Aristotle**. According to this theory, the solution to a problem is found by analyzing the reason and the logic. A "**Mean value of solution**" which will be between the extremes of excess and deficiency.

For example, the solution to the problem of environment pollution is neither by avoiding industrialization and civilization, nor by neglecting the environment completely. A mean solution that will work towards controlling the pollution and protecting the environment will also help.

Problem in Application
The application of this theory varies from one person to another with their powers of reasoning and the difficulty in applying the theory to ethical problems.

What is Golden Mean?
The Golden Mean virtue can be understood as the virtue of reaching a proper balance between extremes in conduct, emotion, desire and attitude. This theory phrased by Aristotle states that virtues are tendencies to find the **golden mean** between the extremes of too much (excess) and too little (deficiency) with regard to particular aspects of our lives.

The most important virtue is **practical wisdom**, i.e., morally good judgment, which enables one to discern the mean for all the other virtues. There are internal goods such as products, activities and experiences should never clash with the external goods such as money, power self-esteem and prestige. The standards of excellence enable internal goods to be achieved. The external goods when extremely concerned, though by individuals or by organizations, threaten the internal goods.

Rights-based Ethical Theory

The Rights based ethical theory was proposed by **John Locke**. According to this theory, the solution to a problem is by realizing that every person has a right to live. Live and let live is the philosophy behind this theory. The rights of a person towards life, health, liberty, possession, etc. are taken care of under this theory.

For example, any action in terms of Capital punishment, Jails, Income taxes and Medical charges etc. come under this category.

Problem in Application
One rights of a person may be in conflict with rights of the other.

What does it mean?
Rights-based ethics is the recognition of human dignity at its most basic form. The ethics refer to the basic human rights whether they are positive or negative. Everyone has a right to live, liberty and the pursuit of happiness. Beauchamp and Childress, authors and ethical theorists, have defined the term "right" to be a "justified claim that individuals and groups can make upon other individuals or upon society; to have a right is to be in a position to determine by one's choices, what others should do or need not do."

The natural law states that human laws are defined by morality and not by some authority. This law is derived from the belief that human morality comes from nature. Any action done by a person that would prevent a fellow being from living a good and happy life, is considered immoral or unnatural. Any law should have some morals. Moral duty is the obligation to act based on ethical beliefs.

Duty-based Ethical Theory

The duty-based ethical theory was proposed by **Immanuel Kant**. According to this theory, every person has a duty to follow which is accepted universally, with no exceptions.

An example of this can be expecting all to be honest, kind, generous and peaceful.

Problem in Application
The universal application of this theory can be misleading.

What are these ethics?
Kant observed that everyone is bound to follow some moral laws. It is the choice we make to be morally sound though we have chances to do anything. This theory can also be called as **Deontological theory** or the **Absolutist theory**. According to this, it is our duty to obey the categorical imperative rules. To have good will, is to perform one's duty for the sake of duty and for no other reason.

The categorical imperative law states that "Act only according to that maxim by which you can at the same time will that it should become a universal law."

There are **four virtues** that come under this law, which have to be discussed here.

Prudence
The quality of prudence states that every individual has a life that should be respected and every individual has duties which should be done without any exception. One should always be cautious to perform one's duties.

Temperance
Temperance is the voluntary self-restrain from the attractions. The temptations that might lead to the violation of duties and ethics have to be restrained. No false promises are to be made as they contradict the principles of duties.

Fortitude
Fortitude is the sense of having tolerance. No perfection can be maintained if happiness alone is sought and no happiness is achieved if perfection alone is sought. Both may or may not go with each other.

Justice
Every individual is a human being with a set of intrinsic values and morals. Truth and fairness are the aspects one should always bear in mind. People should be treated as separate individuals but never as a mere means of existence.

A free will and a will under moral laws are one and the same. We are free only when we act in accordance with our own best natures, while we are slaves whenever we are under the rule of our passions and wills. There should be a universally valid will, under which everyone can be free.

Utilitarian Ethics

The Utilitarian ethics was proposed by **John Stuart**. According to this theory, the happiness or pleasure of a greatest number of people in the society is considered as the greatest good. According to this philosophy, an action is morally right if its consequences lead to happiness of people and wrong if they lead to their unhappiness.

An example of this can be the removal of reservation system in education and government jobs, which can really benefit the talented. But this can have an impact on the rights of the minorities.

Problem of Application
Qualification of the benefits can be difficult.

What are these ethics?

Consider the cost-benefit analysis in engineering. A typical cost-benefit analysis identifies the good and bad consequences of some action or policy in a monetary

aspect. It weighs the total good against total bad and then compares the results to similar tallies of the consequences of alternative actions or rules. This supports the idea of maximizing benefits against cost.

There are two main types of Utilitarianism. They are −

Act Utilitarianism

The Act Utilitarianism focuses on each situation and the alternative actions possible in the situation. Act Utilitarianism states that "A particular action is right if it is likely to produce the higher level of good for the most people in a given situation, compared to alternative choices that might be made."

In accordance with this theory, the good done is only considered but not the way how it is done. For example, looting the richer to feed the poor, can satisfy and make a group of poor people, happy. But looting is not a way of morality. Hence act-utilitarianism seems to justify the wrong-doing.

Rule Utilitarianism

The Rule Utilitarianism states that "Right actions are those required by rules that produce the higher level of good for the most people." We need to consider a set of rules, where they interact with each other. This was developed to clear the problem that occurs with act-utilitarianism.

Engineers with ethics should follow the rule-utilitarianism considering the point, "Act as faithful agents or trustees of employers". So, engineers should abide by it even when an exception might happen to be beneficial. Like in the above example, one should seek the help of law and order to prove the guilt of richer and let see that the poor get benefitted.

Formulation of Ethical Theories:

After having gone through the various ethical theories, one can understand that these ethical theories have to be formulated considering the following points −

- The concepts of the theory formulated must be coherent.
- The tenets of the theory should never contradict the other.
- The theory should never be defended upon false information.

- The theory should guide in specific situations comprehending all aspects possible.
- The theory should be compatible with individual's moral convictions in any situation.

Uses of Ethical Theories

Ethical theories help in the following areas −

- Understanding moral dilemmas.
- Justifying professional obligations and ideas.
- Relating ordinary and professional morality.

More uses are given at the end of this chapter.

2.13 SELF-INTEREST

Self-interest is nothing but one's personal good. It refers to the goodness of oneself in the long run. Each of the ethical theories recognizes the importance of self-respect. Utilitarian considers one's own good as well as the good of others. Duty ethicists stresses duties to ourselves and for won well-being. Ethicists of rights emphasize our rights to pursue our own good.

Virtue ethicists accent the importance of self – respect. Each of these theories insists that the pursuit of self – interest must be balanced and kept under control by moral responsibilities to other people. Now let us consider a view called "ethical Egoism" which challenges all the ethical theories and it tries to reduce morality to the pursuit of self- interest. It is called 'egoism', because it says that the main duty of us is to maximize our own good.

According to Thomas Hobbes and Any Rand, moral values are reduced to concern for oneself but always a rational concern which requires consideration of a person's long- term interests. The Supporters of ethical egoism make a differentiation between narrower and wider forms of self-interest. When a person who selfishly preoccupies his own private good and disregard for the good of others, will be off from rewarding friendships and love.

Personal well-being generally requires taking some large interest in others. But the rational egoist insists that the only reason for showing an interest in others is for the sake of oneself.

Ethical Egoists try to protect their positions by arguing that an ironic importance of everyone rationally pursuing one's self-interest is that every one get benefited. The society benefits mostly when (i) individuals pursue their private good and (ii) corporations pursue maximum profits in a competitive free market. The main idea here is that leads to the improvement of economy through which benefiting

everyone. Because, both the individual and the corporation know very well that what is good for them and how best to pursue that good.

As per ethical egoism, people should always and only pursue their self – interest in a very cautious manner to value the interest rationally on the basis of facts. Morality essentially needs a willingness on the part of both individuals and corporations to place some restrictions on the pursuit of private self – interests.

Accepting these constraints is presupposed in what is meant by moral concern Engineering Ethics also has one task of exhibiting the moral limits on the pursuit of self interest in the Engineering profession. The above said remarks do not constitute a wrong proof for ethical egoism. Morality stresses that we have to give value and we are concerned for the good of other people. Ethical egoism is not a persuasive or probable theory to state what is morality but it is only a convinced rejection of morality.

2.14 CUSTOMS AND RELIGIONS

Customs and Ethical Relativism:

As we live in a society which is of increasingly diverse nature, it is more important to have tolerance for various customs and outlooks. Hence the concept ofethical pluralism emerges. It views that there may be alternative moral attitudes thatare reasonable. But none of the moral perspectives can be accepted completely by all the rational and the morally concerned persons. Ethical pluralism allows the customs which plays an important role in deciding how we should act. Moral valuesare many, varied and flexible. So, these moral values allow considerable variation inhow different individuals and groups understand and apply them in their day-todayactivities. In other words, to be precise, reasonable persons always have reasonable disagreement on moral issues, including issues in engineering ethics.

Ethical Relativism, an objectionable view, should not be confused with Ethical Pluralism. As per Ethical relativism says that actions are morally right when they areapproved by law or custom and they are said to be wrong when they violate laws or customs. Ethical relativism tries to reduce moral values to laws, conventions andcustoms of societies.

What is the necessary for a person to accept ethical relativism? There are so many reasons for accepting ethical relativism –

1. The laws and customs seem to be definite, real and clear – cut. They help to reduce the endless disputes about right and wrong. Moreover, laws seem to be an objective way to approach values. The above argument is some what weak. This reason underestimates the extent to which ordinary moral reasons are sufficiently objective to make possible criticism of individual prejudice and bias. Moreover, moral reasons allow objective criticism of the given laws as morally inadequate. For example, the apartheid laws (racial segregation) in south Africa. This law violated the human rights are not given any legal protections to the majority of the blacks, but morally ought to be.

2. The second reason for accepting ethical relativism is because it believes the values are subjective at the cultural level. They also state that the moral standards are varied from one culture to another. The only kind of objectivity is relative to a given set of laws in a given society. This relativity of morality encourages the virtue of tolerance of difference among societies.

The above said argument is also confusing one. It assumes that ethical relativism is implied by descriptive relativism. i.e., values and beliefs differ from culture to culture. There is nothing self-certifying about the laws and beliefs. This canbe explained by the following illustration. Ethical relativism would allow that Hitlerand his followers (Nazis) acted correctly when they killed 6 million Jews, for theirlaws, customs, and beliefs which were based on anti – Semitism (hostile to Jews).

So, ethical relativism refers anything but for the tolerant doctrine it pretends to be. But there is nothing tolerant in accepting Nazi beliefs about morality Admittingintolerant anti-semitic beliefs is not an act of tolerance.

The supporters of ethical relativism, generally say that an action is right "for cultures" when believe it as the right one.i.e., it is right "for them" though not "for us".So, beliefs, however customary or widely shared, are not self-certifying whether weare talking about moral beliefs or scientific beliefs.

The third reason is based on the moral relationalism or moral contextulaism. This states that moral judgments must be made in relation to some factors whichvaries from case to case. Making simple and absolute rules are impossible in thisway. In most of the cases, customs and laws are considered as morally importantfactors for making judgments.

All philosophers accepted this moral relationalism. But contemporary duty and right ethicists like 'Kant' do not accept. As per their views, respecting people requiresome sensitiveness to special circumstances. The virtue ethicists stress the role of practical wisdom in identifying the facts which are relevant to assessment of conductbased on virtual manner.

The ethical relativism was accepted by early cultural anthropologists because they had a specified tendency to overstress the scope of moral difference between cultures. Absorbed with unusual practices such as head – hunting, human sacrifices and cannibolism (cannibal is a person who eats human flesh); these persons who shifted their idea quickly form moral views differ greatly to "Morality is a simply a culture as such". But modern anthropologists states that all cultures by virtual show some commitment to promote social co-operation and protect their members against needless death and suffering. Moral differences are based only on the circumstances and facts, not on the difference in moral attitudes. For example, we can consider the practice of human sacrifice in the Aztecs. [Members of a former Indian people who ruled Mexico before the 16 century]. This practice seems to be a sign of cruelty and lack of concern for life. But a full examination of their beliefs reveal that they believed their gods are pleased by such sacrifice to ensure the survival of their people and also it was considered an honour for the victims. Refer to the sacrifice or placing chicken and goal to god.

Religion and Divine Command Ethics:

Moral responsibilities and religious belief are interwined in many positive ways. First, they are related historically. Our moral views have been shaped by the most known central moral values within the major world religions. For example, the Judeo-Christian tradition has been influential in Western countries like England, USA etc. Islam has been having a great influence in middle east countries such as Saudi Arabia, Kuwait, Pakistan etc. Confucianism has been influential in China and Buddhism, Hinduism and Taoism have been famous in Asian countries.

Second, most of the people still having beliefs and show some important and inevitable psychological connections between their moral and religious beliefs. Religious views frequently support moral responsibility by providing additional motivation for being moral. Faith in Religions or religious hopes imply trust. This trust gives an inspiration to be moral.

The main social functions of religion is motivating right action based on ethical principles. Religion supports many people to follow their beliefs and promote tolerance and moral concern for others. Many of the engineers are motivated by the religious beliefs.

Thirdly, religions form a set of higher moral standards. For example, Christianity suggests for loving neighbors. Many religions include virtue ethics

that stresses about particular virtues. For example, the ethics if Christianity focuses in the virtue of hope, faith and love. Buddhism emphasizes a feeling of pity (compassion). Islam pressures "insane" (being religious and pursuit of excellence).

Some times, religious set standards below the level of acceptable moral standards. Some religions do not give equal rights to women, as in Islam (particularly in Iran, Iraq). In this situation the conflict is not only between secular morality and religion but also among other religions.

By giving stress on the positive connections between secular morality and religion, we go for defining Divine Command ethics. It views that right action is defined by the commands of God, and without a belief in God there could be no moral values and if an action is said to be wrong, it means that it is forbidden by God.

The Major difficulties in Divine Command ethics are: how to know what God's commands are and whether God exists or not. Judaism, Christianity, Islam and Hinduism are mostly God-centered i.e., they believe in God. But some other religions such as Buddhism, Taoism and Confucianism calls for only faith in a right path from which code of ethics can be derived. For example in Buddhism the right path included eight steps such as ***right understanding, right intention, right intention, right action, right livelihood, right effort, right mindfulness and right concentration.***

Questions on the belief in God were rejected by most of he theologians, [Theology – study of God] based on the question asked by Socrates. Socrates asked why does god make certain commands and not others? Are these commands made on the basis of sudden fancy? The answer is surely no. Because God is supposed to be morally good and He never commands bad acts such as irresponsible killing, rapes, tortures and other immoralities.

Suppose a man claimed that God commands him to kill people randomly without making any religious inquiry, we can say that the main is mistaken.

Divine Command ethics has things backwards. A morally divine being commands on the basis of moral reasons which determines the wrongness of actions and rightness of other actions. Moral reasons are presupposed as the foundation for making certain commands. Moral reasons can not force hard to religious matters. Religious beliefs provides an added inspiration for responding to moral reasons.

2.15 USES OF ETHICAL THEORIES

1. Ethical theories aid in identifying the moral considerations or reasons that constitute a dilemma.

2. They provide a precise sense of what kinds of information are relevant to solving moral development.

3. They sometimes, offer ways to rank the relevant moral considerations in order of importance and provide a rough guidance in solving moral problems.

4. The theories help us identify the full moral ramifications of alternative courses of action, urging a wide perspective on the moral implications of the options and providing a systematic framework of comparing alternatives.

5. The theories augment the precision with which we use moral terms and they provide frame works for moral reasoning when discussing moral issues with colleagues.

6. By providing frame works for development of moral arguments, the theories strengthen our ability to reach balanced and insightful judgments. heir engineering problem.

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MODULE 3: ENGINEERING AS SOCIAL EXPERIMENTATION

Engineering as Experimentation – Engineers as responsible Experimenters- Codes of Ethics- Plagiarism-A balanced outlook on law - Challenges case study- Bhopal gas tragedy.

3.1 INTRODUCTION

Engineering itself is based on the improvement of current life, whether in terms of technology or efficiency or availability with less financial efforts. The process of engineering lets you go through a series of different experiments when it comes to practical use. Though it is not like an experiment in laboratory under controlled conditions, which is done while learning, an engineer should be ready to do the same on a social scale involving human subjects.

Experimentation is the main aspect of designing process. An engineer who is ought to design the parts of a car, will be able to understand the result only when it is tested practically. Preliminary simulations are conducted from time to time to know how the new concept of engineering acts in its first rough design. Materials and processes are tried out, usually employing formal experimental techniques. Such tests serve as a basis, which help in developing the final product.

3.2 ENGINEERING AS EXPERIMENTATION

Experimentation plays an important role in the process of designing the product. When it is decided to change a new engineering concept into its first rough design, preliminary tests or simulation should be conducted. Using formal experimental methods, the materials and methods of designing are tried out. These tests may be based on more detailed designs. The test for designing should be evolved till the final product produced. With the help of feedback of several tests, further modification can be made if necessary. Beyond these tests and experiments, each engineering project has to be viewed as an experiment.

Similarities to Standard Experiments:

There are so many aspects, which are of virtual for combining every type of engineering works to make it suitable look at engineering projects as experiments. The main three important aspects are:

1) Any engineering project or plan is put into practice with partial ignorance because while designing a model there are several uncertainities occurred. The reason to the fact that engineers don‟t have all the needed facts available well in advance before starting the project. At some point, both the theoretical examining and the laboratory testing must be by-passed for the sake of completing the project. Really, the success of an engineer is based on the his talent which is exactly being the ability to succeed in achieving jobs with only a partial knowledge of scientific laws about the nature and society.

2) The final outcomes of engineering projects are generally uncertain like that of experiments what we do. In engineering, in most of the cases, the possible outcomes may not be known and even small and mild projects itself involve greater risks. The following uncertainities occur in the model designs

   1. Model used for the design calculations
   2. Exact characteristics of the material purchased.
   3. Constancies of materials used for processing and fabrication.
   4. About the nature of the pressure the finished product will encounter.

   For instance, a reservoir may cause damage to the surroundings and affect the eco- system. If it leaks or breaks, the purpose will not be served. A special purpose fingerprint reader may find its application in the identification and close observation on the disagreeing persons with the government. A nuclear reactor may cause unexpected problems to the surrounding population leading to a great loss to the owners. A hair dryer may give damage to the unknowing or wrong users from asbestos insulation from its barrel.

3) Good and effective engineering depends upon the knowledge possessed about the products at the initial and end stages.

   This knowledge is very useful for increasing the effectiveness of the current products as well as for producing better products in future. This can be achieved by keenly observing on the engineering jobs by the way of experimentation. This monitoring is done by making periodic observations and tests by looking at for the successful performance and the side effects of the jobs. The tests of the product‟s efficiency, safety, cost-effectiveness, environmental impact and its value that depends upon the utility to the society should also be monitored. It also extends to the stage of client use.

Comparisons with standard Experiments:

Engineering is entirely different from standard experiments in few aspects. Those differences are very much helpful to find out the special responsibilities of engineers and also help them in knowing about the moral irresponsibilities which are involved in engineering.

1. **Experimental Control**

Members for two groups should be selected in a standard experimental control, i.e Group A and Group B. The members of the group "A" should be given the special experimental treatment. The group „B" do not receive the same though they are in the same environment. This group is called the ***'control group'***

Though it is not possible in engineering but for the projects which are confirmed to laboratory experiments. Because, in engineering the experimental subjects are human beings who are out of the control of the experimenters. In engineering, the consumers have more control as they are the selecting authority of a project. So in engineering it is impossible to follow a random selection. An engineer has to work only with the past data available with various groups who use the products.

So engineering can be viewed as a natural experiment which uses human subjects. But today, most of the engineers do not care for the above said Experimental Control.

2. **Informed Consent**

Engineering is closely related to the medical testing of new drugs and techniques on human beings as it also concerned with human beings.

When new medicines have been tested, it should be informed to the persons who undergo the test. They have moral and legal rights to know about the fact which is based on **"informed consent"** before take part in the experiment. Engineering must also recognize these rights. When a producer sells a new product to a firm which has its own engineering staff, generally there will be an agreement regarding the risks and benefits form that testing.

Informed consent has two main principles such as knowledge and voluntariness. First, the persons who are put under the experiment has to be given all the needed information to make an appropriate decision. Second, they must enter into the experiment without any force, fraud and deception. The experimenter has also to consider the fundamental rights of the minorities and the compensation for the harmful effects of that experiment.

In both medicine and engineering there may be a large gap between the experimenter and his knowledge on the difficulties of an experiment. This gap can be filled only when it is possible to give all the relevant information needed for drawing a responsible decision on whether to participate in the experiment or not.

In medicine, before prescribing a medicine to the patient, a responsible physician must search for relevant information on the side effects of the drug. The hospital management must allow him to undergo different treatments to different patients and finally the patient must be ready to receive that information from the physician. Similarly, it is possible for an engineer to give relevant information about a product only when there is a better co-operation by the management and quick acceptance from the customers.

The following conditions are essential for a valid informed consent

a. The consent must be given voluntarily and not by any force.
b. The consent must be based on the relevant information needed by a rational person and should be presented in a clear and easily understandable form.
c. The consenter must be capable of processing the information and to make rational decisions in a quick manner.
d. The information needed by a rational person must be stated in a form to understand without any difficulty and has to be spread widely.
e. The experimenter"s consent has to be offered in absentia of the experimenter by a group which represents many experiments.

Knowledge Gained

Scientific experiments have been conducted to acquire new knowledge. Whereas engineering projects are conducted as experiments not for getting new knowledge. Suppose the outcomes of the experiment is best, it tells us nothing new, but merely affirms that we are right about something. Meanwhile, the unexpected outcomes put us search for new knowledge.

3.3 ENGINEERS AS RESPONSIBLE EXPERIMENTERS

Engineers as Experimenters:

In the process of developing a product, an engineer generally learns through experimentation. To simply put, a trial and error method is the mostly used one to obtain results, but that goes with some calculations. Hence, we can say that, primarily any experiment is carried out with partial ignorance. Even the outcomes of the experiments may not be as expected. An engineer should always be ready for the unexpected output. The improvement of current prototype will lead to some change which may or may not be fruitful.

The experiments made are mostly subjected to risks though the project is small. Many uncertainties are likely to occur depending upon the changes that might occur in the altered model or materials purchased. At times, when the materials were subjected to continued stress and strain, or some process, it might happen that the nature of the substance changes which might lead to some destruction. These are the areas of experiment where nothing is really predictable.

Responsibility in Experimentation:

Although the experiments and the results are uncertain, there are few things which an engineer is ought to keep in mind. Consider the following points which are related to the moral aspects of human behavior −

- To maintain the safety of human beings.
- To procure their rights of consent.
- To keep them aware regarding the experimental nature of the project.
- To warn them about the probable safety hazards.
- Should monitor the results of the experiment continuously.
- Having autonomy in conducting experiments.
- Accepting accountability for the results of the project.
- Exhibiting their technical competence and other characteristics of professionalism.

Conscientiousness

The ethics that an engineer should follow depends upon the moral standards of the individual. Conscientiousness implies **consciousness** which means the sense of awareness. Every engineer is expected to have some moral standards irrespective of the role he is performing.

The present working environment of engineers, narrow down their moral vision fully with the obligations accompanied with the status of the employee. But this might break the moral laws. Along with satisfying the employer's goals, by behaving as a responsible employee, by not doing any fraud, not breaking confidentiality and violating patent rights etc., an engineer should be conscious about the unexpected. Adverse outcome may come up as unexpected result of their experiments; for this, they are answerable to the public.

Informed Consent

As a responsible engineer, one should be informed of the facts so as to be conscious. The engineered products of the company should be in such a way that they can never be used to perform any illegal or unsocial activities, which causes destruction.

It is to be observed that if a company produces some products that are out of fashion or the items which promote wastage of energy and do not fetch in benefits, such things are to be well explained to the employer and alternative solutions should also be suggested by the engineers.

Moral Autonomy

Any person can be morally autonomous only when one is being genuine in one's commitment towards moral values. Moral beliefs and attitudes must be integrated into an individual's personality which leads to a committed action.

The responsibility to answer an unexpected result, influences an engineer to involve himself personally into the work. This leads to moral autonomy wherein, he also gains the trust of the employer, through his commitment. Such responsible actions lead to great outcomes.

Accountability

Accountability can be understood as the moral responsibility that we have towards our actions. It means a tendency to be willing to openly accept the moral examinations towards one's actions and being responsive to the assessment of others. The gap between casual responsibility and moral accountability is common in any profession, along with engineering.

Let us now consider the following instances to understand accountability −

- When a group of persons are involved in the completion of a project, then the accountability refers to the group minimizing the chances of acceptance of moral responsibility towards a specific action, where each person makes only a small contribution to something much larger.
- The accountability is diffused within the organization and one has to accept it. Both credit and failure need to be considered for accountability where the work is diffused and the areas of personal accountability are delimited within the organization.
- At times, when the engineers are pressurized to move to another project while the current is still underway, then the accountability is limited only for meeting schedules.

- There is always a moral involvement beyond the laid down institutional role, where the engineers cannot separate themselves from personal responsibilities of their work.

3.4 CODES OF ETHICS

The engineers who are represented as professionals, and who belong to a professional society need to have some moral responsibilities. A code of conduct is important for engineers to remain committed to their world.

The engineering societies such as **AAES, ABET, NSPE, IEEE** and **AICTE** have framed these codes of ethics which are helpful to engineers to strengthen the moral issues on their work. The codes of ethics play at least eight important roles such as the following:

- **Serving and protecting the public** − Engineers are in a responsible position where trust and trustworthiness, both are essential. A code of ethics functions as a commitment by the profession as a whole that engineers will serve the public health, safety and welfare.
- **Guidance** − Codes are written in brief yet prove effective in offering general guidance to the engineers. More specific directions may be given in supplementary statements or guidelines, which tell how to apply the code. If needed, the assistance is obtained for further specification.
- **Inspiration** − Codes of ethics, which specify a collective commitment towards a profession, help in motivating the engineers towards ethical conduct. Actually, these codes make one feel really responsible and proud to be a professional thus motivating towards the commitment one should have towards one's profession.
- **Shared Standards** − The standards established should be applicable to all individuals, in their particular professions. With the codes of ethics, the public is assured of engineers with minimum standard of excellence and the professionals are provided a fair way to compete.
- **Support for Responsible Professionals** − The professionals who act ethically have more positive support through these codes. A professional engineer who has the intention to stand by the codes of ethics, can have no harm from immoral professional obligations, as he can reject smoothly yet formally. As well, these codes can provide legal support for engineers criticized for living up to work-related professional obligations.

- **Education and Mutual understanding** − The codes which are widely circulated and officially approved by professional societies, promote a shared understanding among professionals, the public and government organizations about the moral responsibilities of engineers. These codes prompt discussion and reflection on moral issues.
- **Deterrence and Discipline** − The professionals who fail to follow the codes exhibit unethical conduct, which is evident from the disobedience towards their profession. Such an investigation generally requires paralegal proceedings designed to get at the truth about a given charge without violating the personal rights of those being investigated. This might lead to expulsion of those whose professional conduct has been proven unethical, which also leads to loss of respect from colleagues and the local community.
- **Contributing to the Profession's Image** − Codes project the engineers as the professionals of ethically committed profession, which inspires them to work with great commitment and more effectively to serve the public. It can also win greater powers of self-regulation for the profession itself, while lessening the demand for more government regulation.

Advantages of Codes of Ethics

Let us now see the following advantages of codes of ethics. The codes

- Set out the ideals and responsibilities of the profession.
- Exert a **de facto** regulatory effect protecting both clients and professionals.
- Improve the profile of the profession.
- Motivate and inspire practitioners, by attempting to define their raison d'etre.
- Provide guidance on acceptable conduct.
- Raise awareness and consciousness of issues.
- Improve quality and consistency.

3.5 PLAGIARISM

Plagiarism is defined in multiple ways in higher education institutions and universities. For example:

- Stanford sees plagiarism as the "use, without giving reasonable and appropriate credit to or acknowledging the author or source, of another person's original work, whether such work is made up of code, formulas, ideas, language, research, strategies, writing or other form."
- Yale views plagiarism as the "use of another's work, words, or ideas without attribution" which includes "using a source's language without quoting, using information from a source without attribution, and paraphrasing a source in a form that stays too close to the original."

- Princeton perceives plagiarism as the "deliberate" use of "someone else's language, ideas, or other original (not common-knowledge) material without acknowledging its source."
- Oxford characterizes plagiarism as the use of "a writer's ideas or phraseology without giving due credit.";
- Brown defines plagiarism to be "appropriating another person's ideas or words (spoken or written) without attributing those word or ideas to their true source".

Avoid Plagiarism:

Northwestern's "Principles Regarding Academic Integrity" defines plagiarism as "submitting material that in part or whole is not entirely one's own work without attributing those same portions to their correct source." Plagiarism can occur in many forms besides writing: art, music, computer code, mathematics, and scientific work can also be plagiarized. This document pays special attention to plagiarism in writing, but it is important to understand that unauthorized collaboration in a math or science assignment is also plagiarism.

In all academic work, and especially when writing papers, we are building upon the insights and words of others. A conscientious writer always distinguishes clearly between what has been learned from others and what he or she is personally contributing to the reader's understanding. To avoid plagiarism, it is important to understand how to attribute words and ideas you use to their proper source.

Guidelines for Proper Attribution

Everyone in the university needs to pay attention to the issue of proper attribution. All of us--faculty and students together--draw from a vast pool of texts, ideas, and findings that humans have accumulated over thousands of years; we could not think to any productive end without it. Even the sudden insights that appear at first glance to arrive out of nowhere come enmeshed in other people's thinking. What we call originality is actually the innovative combining, amending, or extending of material from that pool.

Hence each of us must learn how to declare intellectual debts. Proper attribution acknowledges those debts responsibly, usefully, and respectfully. An attribution is responsible when it comes at a location and in a fashion that leaves readers in no doubt about whom you are thanking for what. It is useful when it enables readers

to find your source readily for themselves. You help them along the way, just as that same source helped you along yours. To make sure that our attributions are useful, we double-check them whenever we can. Quite literally, it is a habit that pays. Colleagues in every field appreciate the extra care. Nothing stalls a career faster than sloppy, unreliable work.

Finally, an attribution is respectful when it expresses our appreciation for something done well enough to warrant our borrowing it. We should take pride in the intellectual company we keep. It speaks well of us that we have chosen to use the work of intelligent, interesting people, and we can take genuine pleasure in joining our name with theirs.

3.6 A BALANCED OUTLOOK ON LAW

The necessity of laws and regulations and the limitations they have in engineering practice can be understood with an overview of the laws in the Engineering profession. To live in harmony in the society, one should learn to maintain a balance between individual needs and collective needs of the society.

The ethical conduct which can maintain such balance, can be applied with the help of laws. Laws are important as the people are not completely responsible and because of the competitive nature of the free enterprise system which does not encourage moral initiative.

Let us look at a few examples from the past that represent the importance of law.

Babylon's Building Code (1758 BC):

This code was set by Hammurabi, king of Babylon. It aimed at the builders of his time wherein, they were forced to follow the code by law. He ordered them,

"If a builder has built a house for a man and has not made his work sound, and the house which he has built was fallen down and so caused the death of the householder, that builder shall be put to death. If it causes the death of the house holder's son, they shall put that builder's son to death. If it causes the death of the house holder's slave, he shall give slave to the householder.

If it destroys property, he shall replace anything it has destroyed; and because he has not made the house sound which he has built and it has fallen down, he shall rebuild the house which has fallen down from his own property. If a builder has built a house for a man and does not make his work perfect and the wall bulges, that builder shall put that wall into sound condition at his own cost".

The above portion of Babylon's building code was respected duly. But the aspects find only little approval today. This code gives a powerful incentive for self-regulation.

The United States Steamboat Code (1852 AD):

The steam engines used for travel during those days were really heavy and bulky. James Watt who invented steam engine worked with two more scientists Oliver Evans and Richard Trevithick who had modified the old steam engines by removing condensers and made them compact.

These redesigned engines though made lighter, couldn't solve the problem of boiler explosions. The speed of the boats if increased led to the explosion of the boilers on steam boats causing disasters. Then Alfred Guthrie, an engineer of Illinois had inspected around 200 steam boats with his own funding and found out the reasons for the boiler explosions and later prepared a report relating to the care that could be taken later.

The recommendations made by him were published by Senator Shields of Illinois and incorporated in senate documents which later was made a law, which made the mechanical engineers of America (ASME), to formulate the standards in the manufacturing of steam boats.

The Challenger Case study:

The world has known about many number of accidents. Among them, the explosion of the space shuttle **Challenger** is one of the most familiar ones. Back then, this case had been reviewed vigorously by media coverage, government reports and transcripts of hearings. This case deals with many ethical issues which engineers faced.

It poses many questions before us. A few questions are listed below −

- What is the exact role of the engineer when safety issues are concerned?
- Who should have the ultimate authority for decision making to order for a launch?
- Whether the ordering of a launch be an engineering or a managerial decision?

Figure 3.1 The cause behind the challenger accident

Challenger space shuttle mainly consisted of an orbiter, two solid propellant boosters and a single liquid-propeller booster, which was actually designed to be a reusable one. All the boosters were ignited and the orbiter took a lift-off from the earth. But the cold temperature caused trouble to the O-rings which were eroded.

The accident took place on 28th January 1986, due to the failure of one of the solid boosters. In the design of the space shuttle, the main parts which needed careful design of the fields joints where the individual cylinders were placed together.

The assembly mainly consists of tang and clevis joints which are sealed by two O-rings, whose function is to prevent the combustion gases of the solid propellant from escaping. The O-rings were eroded by hot gases, as these were made up of synthetic rubber. But this was not a serious problem, as the solid rocket boosters were only for reuse initially for the few minutes of the flight. If the erosion of the O-rings could be restrained from completely burning out then the design of the joint would be acceptable.

In the post flight experiment in 1985, the Thiokol engineers noticed black soot and grease on the outside of the boosters due to the leakage of hot gases blown through the O-rings. This raised a doubt on the resiliency of the materials used for the O-rings. Thiokol engineers redesigned the rings with steel billets to withstand the hot gases. But unfortunately this new design was not ready by that time of flight in 1986.

Figure 3.2

Delay in launch

The political conditions under which NASA operated is the main cause for unavoidable delay in the decision to be taken for the shuttle performance. The launching date had already been postponed for the availability of the then Vice President George Bush, the space NASA supporter. Later, the launch further got delayed due to a problem in micro switch in the hatch-locking mechanism. The cold weather problem and long discussions went on among the engineers. The number of tele-conferences further delayed the previous testing in 1985 itself.

The O-rings required temperature bearings of 53°F whereas the challenger had temperature bearings of only 29°F, which was far below the environment temperature at which NASA had the previous trail. This might not be matter of concern, as the revised final decision made with the available data then, was that there was no correlation between the temperature and the degree at which O-rings had eroded by the blow-by gas in the previous launch. Assuming a safety concern due to cold weather, though the data were not concluded satisfactorily, a decision was taken not to delay further for so many reasons, and the launch was finally recommended.

Unexpected Change

But unexpectedly the overnight temperature at the time of launch was 8°F colder than ever experienced. It was estimated that the temperature of the right hand

booster would be only at 28°F. The camera noticed a puff of smoke coming out from the field joints as soon as the boosters were ignited. But the O-rings were not positioned properly on their seats due to extreme cold temperature. The putty used as heat resistant material was also too cold that it failed to protect the O-rings. All these effects made the hot gases to burn past both the O- rings, leading to a blow-by over an arc around the O-rings.

Though immediately further sealing was made by the by-products of combustion in the rocket propulsion, a glassy oxide formed on the joints. The oxides which were temporarily sealing the field joints at high temperature, later were shattered by the stresses caused by the wind. Again the joints were opened and the hot gases escaped from the solid boosters. But the boosters were attached to the large liquid fuel boosters as per the design. This made the flames due to blow-by from the solid fuel boosters quickly to burn through the external tank. This led to the ignition of the liquid propellant making the shuttle exploded.

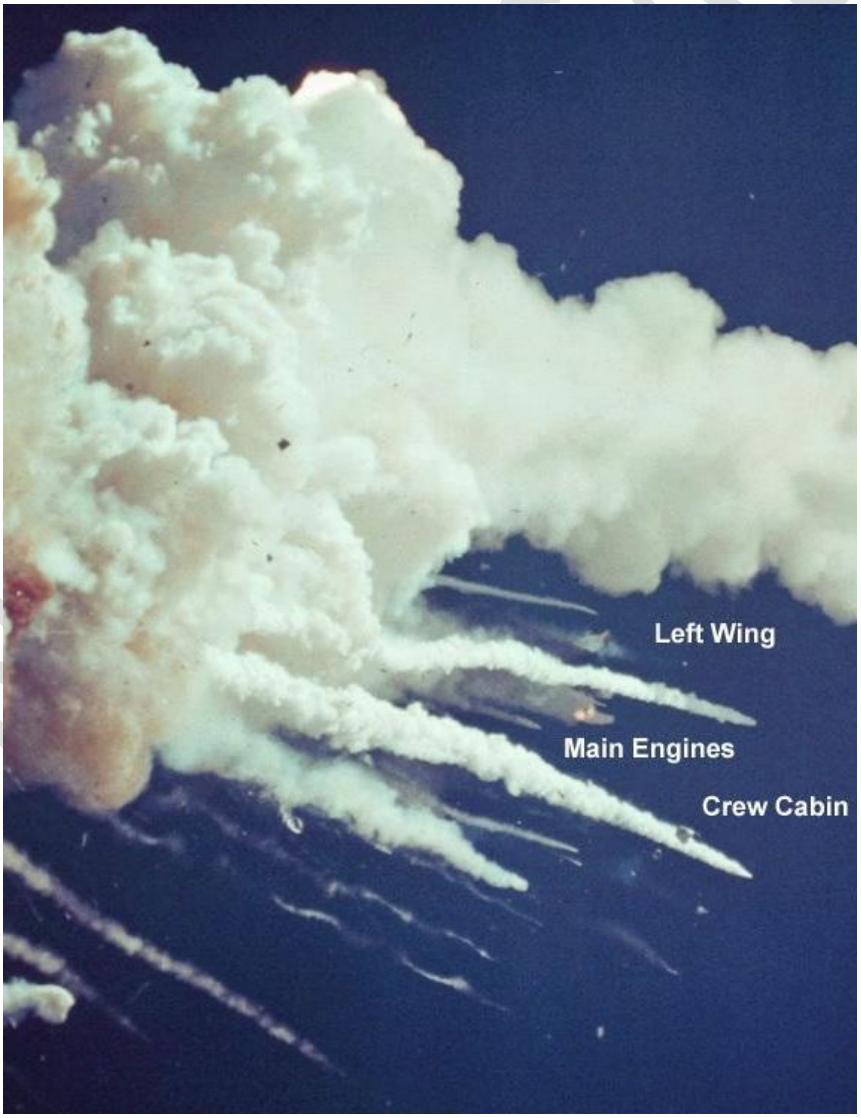

Figure 3.3 Roger's Commission

Later the accident was reviewed and investigations were carried out by the number of committees involved and by various government bodies. President Regan appointed a commission called the **Rogers Commission** which constituted of many distinguished scientists and engineers. The eminent scientists in the commission after thorough examination and investigations gave a report on the flexibility of the material and proved that the resiliency of the material was not sufficient and drastically reduced during the cold launch.

After the hearings of the commission, Thiokol engineers and NASA investigated possible causes of the explosion, which led to a lot of arguments among the other officials that this investigating team is trying to look for other causes, which are not at all plausible. However, the debacle highlights how lack of responsibility and morality, improper functions, and lax performance of duties of the engineers resulted in the failure of the launch.

3.7 BHOPAL GAS TRAGEDY

Bhopal's Gas tragedy is the world's worst industrial disaster that occurred in 1984, due to the gas leakage from a pesticide production plant, The **Union Carbide India Limited (UCIL)** located in **Bhopal**, Madhya Pradesh.

It was believed that slack management and deferred maintenance together created a situation where routine pipe maintenance caused a backflow of water into the MIC tank, triggering the disaster.

What Led to The Disaster?

In the early hours of December 3rd, 1984, a rolling wind carried a poisonous gray cloud from the Union Carbide Plant in Bhopal, Madhya Pradesh of India. The poisonous gas released was 40tons of **Methyl Iso Cyanate (MIC)**. This particular gas is very toxic that leaked and spread throughout the city.

The residents of the city, woke up to the clouds of suffocating gas and struggled to breath. They started running desperately through the dark streets. The victims arrived at hospitals, breathless and blind.

The people who survived had their lungs, brain, eyes, muscles affected severely. Their gastro intestinal system, neurological, reproductive and immune systems were also dangerously affected. By the morning, when the sun rose clearly, the roads were

all filled with dead bodies of humans and animals, the trees turned black and the air filled with foul smell.

The following image shows how the plant got destroyed after the accident.

Figure 3.4

Cause of The Accident

The Union Carbide Corporation (UCC) team and also the CBI (Central Bureau of Investigation) team conducted separate investigations on the cause of the incident and came to the same conclusion. It was understood that a **large volume of water had been released into the MIC tank and this further caused a chemical reaction that forced the pressure release valve to open and allowed the gas to leak**.

UCC's investigation proved with virtual certainty that the disaster was caused by the direct entry of water into Tank 610 through a hose connected to the tank.

The documentary evidence gathered after the incident reveals that the valve near the plant's water-washing section was fully closed and leak-proof. Based on several investigations, the safety system in place could not have prevented a chemical reaction of this magnitude from causing a leak.

Figure 3.5

The safety systems are designed in such a way that water cannot enter unless it is deliberately switched and the water flow is allowed forcefully. The causes and the persons responsible for this deliberate operation are not known.

The Fatal Effects

As per government's announcement, a total of **3,787** deaths occurred immediately. Around **8,000** of the survivors died within two weeks and other **8,000 or more** died from acute diseases caused due to the gas later.

A government affidavit in 2006 stated that the gas leak incident caused **5,58,125** injuries, including **38,478** temporary partial injuries and approximately **3,900** severely and permanently disabling injuries. None can say if future generations will not be affected.

Initial effects of exposure were −

- Coughing
- Severe eye irritation
- Feeling of suffocation
- Burning sensation in the respiratory tract
- Blepharospasm
- Breathlessness
- Stomach pains
- Vomiting

The staff at the nearby hospitals lacked the knowhow required to treat the casualties in such situations. To add to this, there is no antidote known for **MIC**. Hence, even after running to the hospitals, the survivors could not be cured and most of them had to face death eventually.

Primary causes of deaths were −

- Choking
- Reflexogenic Circulatory Collapse
- Pulmonary Edema
- Cerebral Edema
- Tubular Necrosis
- Fatty Degeneration of the Liver
- Necrotizing Enteritis

As an after effect of this disaster, the rate of stillbirths increased by 300% and the neonatal mortality rate by around 200%. This came to be known as the world's worst disaster in the industrial sector.

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MODULE 4: RESPONSIBILITIES AND RIGHTS

Collegiality and loyalty – Managing conflict- Respect for authority- Collective bargaining- Confidentiality-Role of confidentiality in moral integrity-Conflicts of interest- Occupational crime- Professional rights-Employee right- IPR Discrimination.

4.1 INTRODUCTION

Loyalty to corporations, respect for authority, collegiality and other teamwork are a few important virtues in the field of Engineering. Professionalism in engineering would be threatened at every turn in a corporation driven with powerful egos. Robert Jackall, a Sociologist criticizes professionalism saying, "what is right in the corporation is what the guy above you wants from you. That's what morality is in the corporation."

In order to understand how good the ethical factors in a corporate world should be, let us consider the following points −

- Ethical values in their full complexity are widely acknowledged and appreciated by managers and employees alike.
- In an ethical corporate climate, the use of ethical language is honestly applied and recognized as a legitimate part of corporate dialogue.
- Top management sets a moral tone in words, in policies and by personal example.
- The procedures should be followed for conflict resolution.

4.2 COLLEGIALITY AND LOYALTY

Loyalty:

Loyalty, in general use, is a devotion and faithfulness to a nation, cause, philosophy, country, group, or person. Philosophers disagree on what can be an object of loyalty,

as some argue that loyalty is strictly interpersonal and only another human being can be the object of loyalty. The definition of loyalty in law and political science is the fidelity of an individual to a nation, either one's nation of birth, or one's declared home nation by oath (naturalization).

Loyalties differ in basis according to their foundations. They may be constructed upon the basis of unalterable facts that constitute a personal connection between the subject and the object of the loyalty, such as biological ties or place of birth (a notion of natural allegiance propounded by Socrates in his political theory). Alternatively, they may be constructed from personal choice and evaluation of criteria with a full degree of freedom. The degree of control that one has is not necessarily simple; Nathanson points out that whilst one has no choice as to one's parents or relatives, one can choose to desert them.

Loyalties differ in strength. They can range from supreme loyalties, that override all other considerations, to merely presumptive loyalties, that affect one's presumptions, providing but one motivation for action that is weighed against other motivations. Nathanson observes that strength of loyalty is often interrelated with basis. "Blood is thicker than water", states an aphorism, explaining that loyalties that have biological ties as their bases are generally stronger.

Loyalties differ in scope. They range from loyalties with limited scope, that require few actions of the subject, to loyalties with broad or even unlimited scopes, which require many actions, or indeed to do whatever may be necessary in support of the loyalty. Loyalty to one's job, for example, may require no more action than simple punctuality and performance of the tasks that the job requires. Loyalty to a family member can, in contrast, have a very broad effect upon one's actions, requiring considerable personal sacrifice. Extreme patriotic loyalty may impose an unlimited scope of duties. Scope encompasses an element of constraint. Where two or more loyalties conflict, their scopes determine what weight to give to the alternative courses of action required by each loyalty.

Finally, **loyalties differ in the attitude that the subjects of the loyalties** have towards other people. (Note that this dimension of loyalty concerns the subjects of the loyalty, whereas legitimacy, above, concerns the loyalties themselves.) People may have one of a range of possible attitudes towards others who do not share their loyalties, with hate and disdain at one end, indifference in the middle, and concern and positive feeling at the other.

Loyalty is the faithful adherence to an organization and the employer. Loyalty to an employer can be either of the two types −

- **Agency-loyalty** − Agency-loyalty is acting to fulfil one's contractual duties to an employer. This is entirely a matter of actions, such as doing one's job and not stealing from one's employer, irrespective of the motive behind it.
- **Attitude-loyalty** − Attitude-loyalty has a lot to do with attitudes, emotions and a sense of personal identity as it does with actions. It can be understood that people who work grudgingly and spitefully are not loyal; in spite of the fact they may adequately perform all their work responsibilities and hence manifest agencyloyalty.

Collegiality:

Collegiality is the term that describes a work environment where responsibility and authority are shared among the colleagues. When Engineering codes of ethics mention collegiality, they generally cite acts that constitute disloyalty. The disloyalty of professionals towards an organization, reflects the attitude they have towards the work environment for the salaries they are paid and the trust the company has for them.

Collegiality is the relationship between colleagues. Colleague is taken to mean a fellow member of the same profession, a group of colleagues united in a common purpose, and used in proper names, such as Electoral College, College of Cardinals, and College of Pontiffs.

Colleagues are those explicitly united in a common purpose and respecting each other's abilities to work toward that purpose. A colleague is an associate in a profession or in a civil or ecclesiastical office. Collegiality can connote respect for another's commitment to the common purpose and ability to work toward it. In a narrower sense, members of the faculty of a university or college are each other's colleagues.

Sociologists of organizations use the word collegiality in a technical sense, to create a contrast with the concept of bureaucracy. Classical authors such as Max Weber consider collegiality as an organizational device used by autocrats to prevent experts and professionals from challenging monocratic and sometimes arbitrary powers.

The National Society of Professional Engineers (**NSPE**) Code, for example, states that "Engineers shall not attempt to injure, maliciously or falsely, directly or indirectly, the professional reputation, prospects, practice or employment of other engineers.

Engineers who believe others are guilty of unethical or illegal practice shall present such information to the proper authority for action".

The main factors that help in maintain harmony among members at a workplace are:

- Respect
- Commitment
- Connectedness

In detail, the colleagues are to be respected for their work and contribution towards the organizational goals and should be valued for their professional expertise and their dedication towards the social goods promoted by the profession. Commitment observed in the sense of sharing a devotion to the moral ideals inherent in one's profession. The coordination among all the members at a workplace or the awareness of participating in cooperative projects based on shared commitments and mutual support, also encourages the quality of the work.

4.3 MANAGING CONFLICT

Conflict in any work environment is inevitable for the simple reason that whenever people have to work together they will not always be in perfect agreement on all issues, goals, or perceptions. From this emerges a definition of conflict — a **"disagreement between two or more organisational members or groups arising from the fact they must share resources of work activities and/or from the fact that they have different status, goals, values or perceptions."** In short, conflict refers to any kind of opposition or antagonistic intersection between two or more parties.

Conflict is inherently neither positive nor negative. If it is managed correctly, it can be helpful (functional) in meeting the organisational goals. If it is mishandled or not managed correctly, it can be destructive (dysfunctional). In order to manage conflict, a manager needs to understand why conflict arises or what are its sources?

Causes of Conflict:

Conflict can occur throughout the organisation: between one individual and another, between groups, between groups and individuals and the organisation. In general it arises due to problems in communication (e.g., misunderstandings due to semantics, unfamiliar language, or ambiguous or incomplete information), personal relationships (e.g., incompatibility of personal goals or social values of employees with the role behaviour required by their jobs, or organisational structure (e.g., power struggles between departments with conflicting objectives or reward systems, competition for scarce resources, or interdependence of two or more groups to achieve certain common goals).

Conflict may also arise due to certain personality characteristics, such as authoritarianism or dogmatism. Such conflict resolution is difficult.

Methods for Managing Conflict:

1. Collective Bargaining:
It is the process of direct negotiation on a collective or group basis between the representatives of employers and their employees for the settlement of disputes. The mutual rights and obligations of both parties that are agreed by them through negotiation are written down in the form of an agreement or contract, which is legally binding on them.

Collective bargaining can also be defined as:
(a) Negotiations between the management and the union for agreeing on as written agreement covering the terms and conditions of settlement of the disputed issues.
(b) A give-and-take process involving proposals and counter proposals.
(c) Introduction of an element of democracy in the field of Industrial Relations.

Collective bargaining prevents unilateral actions related to employees, and it imposes certain restrictions upon the employer.

2. Conciliation and Mediation:
If collective bargaining fails, then this may be adopted.

Conciliation consists of a series of conferences, including informal sitting between representatives of the two parties, which are designed to create a friendly atmosphere, give and take attitude with a view to ultimately smooth out the differences.

When the conferences are held with an outsider as Chairman, the process is known as 'Mediation'. In this method, the presence of a third party acts as a moderating influence on the two contending parties. What they themselves cannot settle, may be solved under the influence and with the suggestions of an outsider.

3. Arbitration:
When above two methods fail, then this can be adopted. In this, a third person is chosen as the Arbitrator by agreement between the employers and employees. He gives a hearing to both parties and then offers his own solution of the dispute.

In case of 'Voluntary Arbitration', the obligation to abide by his decision is moral one. Under 'Compulsory Arbitration', the parties have to abide by it under compulsion of law.

In India, a legal provision for Conciliation and Arbitration has been made in the Industrial Disputes Act, 1947.

Unfortunately, it has been experienced that both the procedures are not popular either with the workers or the management. However, these have been found useful in removing industrial disputes. The Whitley Commission has recommended the establishment of such councils for the industries in India.

In pursuance of this, Government of India established Indian Labour Conference, Standing Labour Committee and Industrial Committees for plantations, coal, mining and cotton textile industries. In the same manner, joint committees for factories are being established.

Conflict Management Processs:

When a conflict, arises whether intra-individual, inter- individual; intra-group or inter- group in an organisation, it must be resolved as early as possible. In an organisation, there must be someone to intervene before the situation goes worse and generally a superior helps to improve the situation.

In order to resolve the conflict effectively the seniors or superior should handle the situation carefully and take the following steps:

1. Preliminary step — knowing the conflict;
2. Diagnosing the issue;
3. Applying any of the conflict handling modes.

1. Preliminary Step:
The first stage in resolving the conflict is to know the full details of the conflict. As soon as the conflict comes to the knowledge of the senior or superior, he should handle the conflict skillfully.

The first thing to note in the stage of conflict because, if it is in its initial stage, it requires less efforts and much efforts will be needed at advanced stage of conflict. Even the strategies used may also differ from stage to stage though there is hardly a relationship between the stage of conflict and strategies used.

Before analysing the issues involved in the conflict, it should also be considered that the person who is being entrusted the responsibility to intervene and resolve the conflict, should be objective enough in handling the problem.

Though, it is very difficult to keep emotions and sentiments out of the job and attain absolute depersonalisation, yet one can be objective if he keeps an open mind. For this purpose, one should listen to views of individuals who are in conflict though they may not be fully in agreement with him provided the individual concerned does not carry rigid perception. The seniors or superior must try to keep the individual's mind open.

2. Diagnosing the Issue:

In diagnosing the issues, the issues involved in the conflict should be analysed and it should be understood what this conflict is about. How far it has already involved. Thus, the nature of conflict should be found out. Generally, conflict may arise due to facts, goals, methods, and values.

In other words, facts at the disposal of two parties may differ or their goals may differ or their methods to be used for doing a particular task may differ or their views about what is good, bad, wrong or right may differ. So, the person entrusted to handle the conflict must find out what the conflict is about.

The next thing in diagnosing the issue is to know why these differences between the two parties have arised. The factors responsible for promoting the difference may be informational, perceptual, role factors can the like. At times, the information received by two parties may be different and therefore they may draw different conclusions. People may also have different backgrounds.

Their beliefs, attitudes, values, and cultural norms may differ and therefore their perception may differ. An individual may have different roles in different groups of which he is a member and these roles may clash or the role of one individual may differ from the other individual. For Example — A senior or superior may have an urgency of getting a particular work done but the sub-ordinates does not think so. It may lead two persons to clash.

Once the problem is identified and what has caused the problem becomes known, the stage at which it has already reached can be properly understood. The next important step is to develop a strategy to deal with the situation.

3. Conflict Handling Modes:

There are a number of strategies which we may adopt to resolve the conflict and the important of them are as follows:

(a) To avoid appearance of conflict;

(b) Not permitting conflict to surface;
(c) Mediation;
(d) Letting the parties in conflict to settle their scores; and
(e) To solve the problems mutually.

(a) To Avoid Appearance of Conflict:
This approach suggests that such conditions and atmosphere should be created in the organisation so that there may not be any conflict in the organisation. If any conflict arises it should be removed and redressed as early as possible. This situation is possible when the organisation is staffed with like-minded people and possibly keeps a watch over their inter-personal relations.

They should always be submissive to their superior and should never be aggressive or in conflict with him. If there is a difference of opinion between the two, it should be removed or it should be ignored.

This kind of conformity and agreement may be necessary where blind faith in the leader of the group is required. It is very common in political and religious organisations which demand total commitment of members towards

the goals arid ideals of the organisation. But in this approach, the creativity of the members is lost and they are not able to put forward their ideas for the sake of simple conformity.

(b) Not Permitting Conflict to Surface:
This strategy suggest that loyalty and cooperation to the group is supreme and disagreement need not be tolerated and may be treated equivalent to disloyalty to group. People who are loyal and co-operative should be rewarded and those, who are not should be removed or should be punished.

As soon as the conflict is known to the superior, the parties in conflict should be warned of the serious consequences and should be ordered to sink their differences or matters be referred to 'upstairs' or the superior should insist on his own way.

This kind of approach of repression and forcing may work where talent difference is not so important as the pressure of the time but such suppressed differences may erupt at any time appropriate for the organisation and may hit safe targets. This approach does not create a satisfying situation and if the matter is allowed to brew for long, the party concerned whose views are suppressed always looks for an opportunity embarrassing the position of authority holder.

(c) Mediation:
Under this approach an attempt should be made by the authority holder to sweep out the difference and to smoother the affairs to make it look as if the problem never

existed. He may exercise persuasion, highlighting the merits and demerits of their cases. He may conciliate, mediate, bringing home to them the commonness in their view points and if necessary even go for arbitration.

It is quite possible that the both the parties may leave the case to the superior to give his judgement, in case of failure of finding any solution of the case, then both will accept his decision. It may also be just possible that a compromise takes place or they may arrive at a mutually acceptable agreement.

Under this approach both parties make a shift in their stand on give and take basis. It may be with or without the intervention of the superior. This strategy is most commonly used.

(d) Letting the Parties in Conflict to Settle their Scores:
Sometimes, we find that the parties adopt a rigid attitude in the organisation and are not aware able to reason or appeal. They are allowed to fight out the issues. They are given an opportunity to test their strength and capacities and to bear the consequences whatsoever. In such cases it can be possible that the party may have the realisation of each other's strength and leave their priorities, accept the ideas and interpretation of others and resort to bargaining. The parties, before this approach should assess the cost of such conflicts – economical and social.

This approach has far reaching consequences. In case the opposition feels defeated there will develop personal distance that will never be reduced. The losing party will always try to find out ways how to take revenge. Besides such potentially disruptive consequences of this approach, it almost necessarily places strains on the status on power system in the organisation. It acknowledges and legitimises the heterogeneity of goals. This approach is not willingly or frequently adopted.

(e) Mutual Problem Solving:
When two parties are conscious about the existence of a problem and try to resolve their difference themselves, it is called mutual problem solving or collaborating. As both parties are interested in finding a solution, the reference should always be made of the shared goals, generally the sub-ordinate goals. The perceptions of people are not rigid.

This approach is better when time pressure is not serious though it is a very time consuming process to come across a common acceptable solution. If in the mean

while a party loses patience, all efforts are likely to go waste. Therefore, a solution should be resolved before a party loses patience.

Whatever may be the approach for handling conflict, it is necessary to be sure that communication channels are neither blocked – non broken down. Free flow of information must be maintained otherwise lack of information or blocked communication channels causes disruptive behaviours. As a result, the gap between the two parties widens and then it will be irreparable. It may also be suggested that whatever may be the nature, stage or class of conflict; it should always be regarded as individual (and not group conflict) and analytic conflict.

In short, an impression should not be created that the conflict has engulfed the whole organisation. The approach should be problem solving and persistent persuasion of the parties.

4.4 RESPECT FOR AUTHORITY

In order to meet the organizational goals, the professionals should possess respect for authority. The levels of authority maintained by the organization provides a means for identifying areas of personal responsibility and accountability.

Following are the major types of authority −

- **Executive Authority** − The corporate or institutional right given to a person to exercise power based on the resources of an organization.
- **Expert Authority** − This is the possession of special knowledge, skill or competence to perform a particular task or to give sound advice.

According to the goals of the company, the hierarchical authority is distributed. A service oriented or engineer-oriented company concentrates on the quality of the products which are decided by the engineers as they are the subject matter experts. Whereas a company when it is customer-oriented company, focuses primarily on the satisfaction of the customers. Hence the goal of the company decides the power between a General Manager and a Technical Manager or an Engineer.

4.5 COLLECTIVE BARGAINING

It is the responsibility of an organization to look into the welfare of the section of people working in it. Their issues need to be discussed. When we discuss issues, there can be issues which need to be discussed among the employees themselves and resolutions can be found for the same. However, there can be issues which might require the intervention of the management. In order to deal with such complex situations, an Employee Union is formed wherein, each employee becomes a member and a leader is elected to represent the group whenever needed.

At the time of conflicts or arguments, there will arise the need for negotiation between the parties. Conflicting situations which call for negotiation might occur on areas related to pay scales, working hours, training, health and safety, overtime, grievance mechanisms, rights in work places or company affairs, etc. The process of voluntary negotiations between the employers and a group of employees to resolve the conflicts is called **Collective Bargaining**.

The parties often refer to the result of the negotiation as a **Collective Bargaining Agreement (CBA)** or as a **Collective Employment Agreement (CEA)**.

The underlying idea of collective bargaining is that the employer and employee relations should not be decided unilaterally or with the intervention of any third party. Both the parties must reconcile their differences voluntarily through negotiations, yielding some concessions and making sacrifices in the process. Both should bargain from a position of strength. There should be no attempt to exploit the weaknesses or vulnerability of one party.

With such an awareness, the necessity of formation of Unions was observed in all the organizations and the idea was strengthened to form larger labor unions. Both parties have, more or less, realized the importance of peaceful co-existence for mutual benefit and continued progress.

Types of Collective Bargaining:

There are four main types of collective bargaining −

- **Distributive Bargaining** − In this, one party's gain is another party's loss. **Example** − Wages
- **Integrative bargaining** − In this, both the parties may gain or none of the parties may face a loss. **Example** − Better training programs
- **Attitudinal Structuring** − When there is backlog of bitterness between both the parties then attitudinal structuring is required to make smooth industrial relations.
- **Intra-organizational Bargaining** − There can be conflicting groups in both management and unions also. So, there is need to achieve consensus in these groups.

i. Distributive Bargaining:

It involves haggling over the distribution of surplus. Under it, the economic issues like wages, salaries and bonus are discussed. In distributive bargaining, one party's gain is another party's loss. This is most commonly explained in terms of a pie. Disputants can work together to make the pie bigger, so there is enough for both of them to have as much as they want, or they can focus on cutting the pie up, trying to get as much as they can for themselves. In general, distributive bargaining tends to be more competitive. This type of bargaining is also known as conjunctive bargaining.

ii. Integrative Bargaining:

This involves negotiation of an issue on which both the parties may gain, or at least neither party loses. For example, representatives of employer and employee sides may bargain over the better training programme or a better job evaluation method. Here, both the parties are trying to make more of something. In general, it tends to be more cooperative than distributive bargaining.

This type of bargaining is also known as cooperative bargaining. The integrative strategies require that both management and the union drop combative attitudes and adopt a genuine interest in the joint exploration of solutions to common problems. To work effectively, integrative bargaining must become a way of life for the two parties that include continual efforts to improve relationships through regular discussions of problems at all levels and willingness to attempt to settle these problems with third party interventions.

Solutions to the most difficult problems can be approached by establishing special committees, whose members are drawn from both management and labour to study the issues and determine the facts.

iii. Attitudinal Restructuring:

This involves shaping and reshaping some attitudes like trust or distrust, friendliness or hostility between labour and management. When there is a backlog of bitterness between both the parties, attitudinal restructuring is required to maintain smooth and harmonious industrial relations. It develops a bargaining environment and creates trust and cooperation among the parties.

iv. Intra-Organizational Bargaining:

It generally aims at resolving internal conflicts. This is a type of manoeuvring to achieve consensus with the workers and management. Even within the union, there may be differences between groups.

For example, skilled workers may feel that they are neglected or women workers may feel that their interests are not looked after properly. Within the management

also, there may be differences. Trade unions manoeuvre to achieve consensus among the conflicting groups.

Objectives of Collective Bargaining:

i. To increase mutual confidence between the employer and employees;
ii. To regulate terms and conditions of employment without intervention of a third party;
iii. To create cordial environment in the establishment;
iv. To protect the interest of the employees; through collective action and by preventing unilateral action on the part of the employer;
v. To raise the socio-economic attributes of the employees.

Process of Collective Bargaining:

Collective bargaining is a process by which employers and employees confer in good faith and come to an understanding about the terms and conditions of work and other related aspects. The objective of bargaining is to settle matters on discussion tables with mutual consent and cooperation.

Management is usually represented by senior executives of the company and the workers are represented by the trade union leaders and officials. Among the different methods available for the settlement of industrial disputes and coming to a long-term understanding with labour, collective bargaining is the most important one.

The process of collective bargaining involves six major steps:

1. Preparing for Negotiations:
Preparing for negotiations involves preparation before negotiation with the other parties to reach to an agreement Both the parties involved in collective bargaining should prepare before going for negotiation so that there can be proper negotiation at the time of discussion. The preparation would include the issue, parties involved, causes, costs and impacts. This would bring confidence in the participating parties and would result in effective negotiation. This is the first step of the process.

2. Identifying Bargaining Issues:
Before going for negotiation, the issue and possible related areas for discussion are to be identified. The knowledge regarding these issues must be collected. All detailed information should be wife the negotiator. During discussion, the confusions can be

avoided. The negotiator on the basis of through knowledge of the issue for discussion would proper and effective discussion and the problem solution would become very easy.

3. Negotiations Procedure:
The negotiation procedure means how the negotiation would take place. Negotiation procedure is the method of negotiation. It would show that the activities are to be performed, who would perform and sequence and timing of the activities. This would clear the position in mind of negotiator and would bring confidence in his mind.

4. Reaching the Agreement:
The negotiation process begins when the concerned parties meet and submit their demand on the table to the other parties. It starts with submission of the demands of the trade union to the management. The negotiation starts with the submission and bargaining takes place. Through discussion they reach to an agreement. Negotiation completes with a mutually acceptable agreement.

5. Ratifying the Agreement:
During discussion whatever they have discussed and reach to an agreement that is to be ratified by both the parties. Once the agreement is ratified, the issue of difference or conflict is over and negotiation comes to an aid. Without acceptance of the agreement the negotiation cannot be completed.

6. Administration of the Agreement:
Once the agreement is accepted and signed, the agreement will be administered as per the terms and conditions of the agreement. In future, the work would be performed according to the ratified agreement. If doubt is there then the agreement in written would be referred.

If the process completes the above mentioned steps it can be said the collective bargaining process has been completed. If not or some steps not followed, then it can be said the bargaining process was not effective or a failure. So these steps are important in this process.

Advantages of Collective Bargaining:

The main advantages of collective bargaining are as follows:

1. Effective in Protecting and Promoting Interests of Workers:
Collective bargaining has contributed much towards protecting and promoting the interests of workers, especially in regard to the terms and conditions of employment. Unions in many countries of the world have successfully contracted agreements with employers, for higher wages, improved fringe benefits and cash allowances, job

security, better physical working conditions, social security benefits and so on. In many cases, the benefits accruing to the workers through collective bargaining have been much better than those available or expected under legislation or industrial awards.

2. Control of Management's Autocracy:
Collective bargaining has increasingly usurped the prerogatives traditionally enjoyed by the employers of unilaterally laying down the terms and conditions of employment of their employees. Apart from wages, hours of work and working conditions, many more subjects have come within the ambit of collective agreements. Thus, collective bargaining has tended to impose a substantial check on employers' autocracy in taking decision over matters of concern of their employees.

3. Promotion of Durable Industrial Peace:
Where the terms and conditions of employment of employees are determined by mutual agreement and understanding between the employer and the union representing the employees, the scope of further differences over the subjects of agreement is considerably minimised. Besides, the parties are placed in a better position to understand and appreciate their respective problems and difficulties, which results in the development of a co-operative environment in the enterprise.

Solution of a contentious issue imposed from outside, such as an adjudication authority, may not satisfy either or both the parties. Besides, most collective agreements also provide for grievance procedure for redressing grievances arising out of the interpretation or application of collective agreements. Thus, collective bargaining is expected to ensure durable industrial peace in enterprises.

4. Conducive to the Enhancement of Managerial Efficiency:
Collective bargaining enables managers to understand the problems of the employees in the right perspective. Similarly, the union is also enabled to understand the genuine problems facing the management and the enterprise. Negotiations taking place in frank and free atmosphere can reveal the areas of deficiencies in managerial practices and thereby enable managers to adopt appropriate measures to rectify them. Besides, the suggestions of the trade union may provide a useful feedback.

5. Establishment of Industrial Rules and Creation of Labour Standards:
Collective bargaining has also been helpful in the establishment of industrial rules and creation of useful labour standards. The rules and norms embodied in the labour

contract of one firm often lead to the establishment of similar rules and norms in other firms, and the process goes on continuing.

In this way, a sort of uniformity in industrial rules and labour standards is established on a wide scale. It has been experienced that labour standards uniformly embodied in collective agreements of several firms on major issues of concern of a large bulk of workers such as bonus, gratuity, provident fund and so on have provided the basis for the adoption of legislation for ensuring their wider coverage.

Disadvantages of Collective Bargaining:

Collective bargaining also results in certain disadvantages to the parties to negotiate:

i. Strikes:
The strike creates a dilemma for those who have accepted the institution of collective bargaining because it is difficult to have collective bargaining without the right to strike. At the same time strikes can inflict considerable damage on the public image. Much attention has been given to the problem of how to maintain collective bargaining while preventing the damage that might be inflicted upon by the strikes. No effective solution has been found yet.

ii. Based on Power and Conflict:
Collective bargaining is based on power and conflict and does the most for the people who need it least. The stronger workers in the labor market could protect the income of their skills while the weakest workers in the work force have very limited ability to form unions and hence are unable to gain the benefits of collective bargaining.

iii. Lacks Safeguards for Public Interest:
Collective bargaining does not contain sufficient safeguards for the public interest, which might be ignored by collusion between strong unions and employers to fix prices. In the U.S.A., where collective bargaining is a feature of industrial relations, it is claimed that it has impeded the economy's growth, imparted an upward drift to the general price level and periodically imperilled the nation's health and safety.

4.6 CONFIDENTIALITY

The other important responsibility of an employee or an engineer is to maintain the confidentiality of the organization or the employer. To understand confidentiality, we need to understand what is Intellectual Property.

Intellectual Property:

This term is often used in the world of business. **Intellectual property** refers to creations of mind such as inventions; literary and artistic works, designs; and symbols, names and images used in commerce.

The ideas and formulations in one's mind are put in action or may not be done so, but that idea is the result of one's intelligence and it cannot be stolen. Such problems are mostly encountered by scientists, engineers, business people or the upcoming entrepreneurs, and such. Intellectual Property, i.e., IP is protected by the law; **patents, trademarks** and **copyrights** enable people to earn recognition from what they invent or create.

While being associated with an organization, an engineer is expected to follow a few moral rules and avoid affecting the intellectual properties of anyone. These when adopted by an organization, through some agreement, it becomes the responsibility of every employee to maintain the confidentiality throughout that project.

Confidentiality:

When the word **confidential** is added to any information, it means that it should not be shared with one and all. It is mostly a trade secret. Maintaining confidentiality and avoiding harmful conflicts of interest are especially important aspects of teamwork and trustworthiness.

Confidentiality is that practice which helps **to keep secret** all information deemed desirable to keep secret. The maintenance of secrecy refers to the unrevealing of any data concerning the company's business or technical processes that are not already in public knowledge. Every company has some knowledge and can identify the individuals and groups that might have access to a particular set of information. The members of such groups share the responsibility of maintaining confidentiality.

Types of information

The confidential information can be understood as Privileged Information and Proprietary information. **Privileged information** means "available only on the basis of special privilege" such as a privilege accorded an employee working on a special assignment. **Proprietary information** is the information that a company owns or is

the proprietor of, and hence is a term carefully defined by property law. It is simply called trade secret.

The patents legally protect the products from being manufactured and sold by other competitor unless a patent holder grants permission. Whereas the trade secret, has no such legal protection. Hence a reverse engineering can be done by analyzing a product to estimate its manufacturing so as to duplicate it or to develop something more than that, without any kind of permissions.

Changing jobs

The obligation to protect confidential information does not cease when employees change jobs. The former employees are bound by moral rules and are not supposed to indulge in revealing or selling such information to the new employers. An employee may change his job for his personal financial or career-oriented growth. But that should never effect the old company, which he used to work for.

An engineer's knowledge base generates an intuitive sense of what designs will work and will not work, and trade secrets form part of this knowledge base. It is usually considered a better deal, if the employee is not allowed to change the job until the project finishes; this helps in avoiding unnecessary revelation of information.

Management Policies

To protect the personal interest and rights of engineers and other employees while recognizing the rights of employers, employment contracts with a few restrictions imposed, helps. Usually, those restrictions centered on the geographical location of future employers, the length of time after leaving the present employer before one can engage in certain kinds of work and the type of work it is permissible to do for future employers.

But such contracts threaten the right of individuals to pursue their careers freely and hence courts tend not to recognize them as binding. The employers might try different plans such as an agreement not to work for similar project for few years or to be an outside consultant for the same project until it finishes so as to make them abide morally. Other tactics like restricting trade secrets to employees where absolutely essential might result in lessening the knowledge base of engineers involved in research and development.

One potential solution for employers might be generating a sense of professional responsibility among the staff that reaches beyond merely obeying the directives of current employers.

Justification

The primary justification is to **respect the autonomy** (freedom, self-determination) of individuals and corporations and to recognize their legitimate control over some private information concerning themselves. The rights and duties of autonomy along with its utilities are to be observed. The trust and trustworthiness can grow once confidentiality is maintained properly.

4.7 CONFLICTS OF INTEREST

A person may have different types of interests. Such interests can be pursued according to the will, convenience and the laws prevailing. A person working in an organization might have multiple interests related to the job he is doing; if he does some side business which means he might be a competitor or he might work with a competitor, it might pose a problem for the employer. Such an employee is usually fired from the organization.

Thus, we can refine our definition of **conflicts of interest** by saying that they typically arise when the following two conditions are met −

- The professional is in a relationship or role that requires exercising good judgment on behalf of the interests of an employer or client.
- The professional has some additional or side interest that could threaten good judgement in serving the interests of the employer or client.

Dilemma:

There occurs a usual dilemma between **conflicts of interest** and **conflicting interests**. To get a clear understanding between both, let us consider two examples.

Example 1
Let us consider a girl who needs to choose from among her interests in order to fit in her timetable. She wants to attend the exam in college, to attend the music class, to go out for a movie, to deliver a seminar and also go visit her friend. As she is falling short of time, it is her interest to choose what to do and what not. The term used to mention this can be "**Conflicting interests**" and this cannot be morally wrong.

Example 2
If another instance is considered where a man works for a company, being in some crucial position where he has access to all the confidential information and if he

works as an unofficial adviser to his wife's company, it would be morally wrong, where a moral conflict definitely arises. This can be termed as "**Conflict in interests**".

Hence, the two concepts are different.

There arise very subtle situations with various conflicts of interests. Let us see the most common ones −

Gifts, bribes and kickbacks

The following definitions will help us understand this −

- A **bribe** is a substantial amount of money or goods offered beyond a stated business contract with the aim of winning an advantage in gaining or keeping the contract and where the advantage is unfair or otherwise unethical.
- **Gifts** can be small gratuities offered in the normal conduct of business.
- Prearranged payments made by contractors to companies or their representatives in exchange for contracts actually granted are called **Kickbacks**.

At times, if the money or gifts offered are substantial enough to threaten the fairness of competitive situations, then such gifts turn out to be bribes. They cannot be accepted as simple gratuities. Hence there is a thumb rule stating such condition as, "If the offer or acceptance of a particular gift could have embarrassing consequences for your company if made public, then do not accept the gift".

Interest in other companies

An Employee while working in his company, if supports another company, during his leisure time to earn more or for some other career aspects, can be understood as committing an immoral act. Such an act is called **Moonlighting** which usually creates conflicts of interests. Instances creating such conflicts can be working for competitors, suppliers or customers.

The want of additional income or the need for personal and professional growth might foster one to pursue such ideas, which usually creates problems. A special kind of conflict of interest arises, however, when moonlighting leaves one exhausted and thereby harms the job performance.

Insider information

The insider information might concern one's own company or another company with which one does business. Leakage of the information for the interest of some other benefits is like digging one's own pit. The interest in other's companies makes a person morally low and lets him to go beyond moral boundaries and this might

create an impact on the confidentiality for the reception of special privileges. When a person crosses his moral grounds, even the beneficiaries stop trusting him further.

Employee conflicts of interest occur when employees have interests that if pursued can keep them from meeting their obligations to serve the interests of the employer or client for whom they work.

4.8 OCCUPATIONAL CRIME

Also known as workplace crimes, occupational crimes are defined as offenses that are committed by someone during the course of his or her employment. Occupational crimes encompass a wide range of criminal acts, but the most common include white collar offenses, such as embezzlement, money laundering, tax fraud, and the misuse of company information or property.

Although all white collar crimes tend to come with harsh penalties, occupational offenses are often accompanied by particularly severe consequences, including jail time, hefty fines, and the loss of a professional license or practice, so if you have been accused of committing an occupational crime, it is critical to contact an experienced white collar crime lawyer who can help you present a strong defense.

Defining Occupational Crimes

Occupational crimes typically originate in an employee's unlawful use of company information, property, funds, or data and because they usually do not involve violence, are usually charged as white collar crimes. For instance, an accountant at a manufacturing business who purposely withheld information about company revenue from the IRS can be found guilty of corporate tax fraud because he or she used access to sensitive company information, namely revenue reports, to defraud the federal government.

Common Forms of Occupational Crime

The most common type of occupational crimes are actually white collar offenses, or financial crimes that are committed by employees or business professionals. It's important to note that occupational crimes are not limited to those who work in the private sector. The corruption of government officials, for example, also qualifies as an occupational crime. Other common examples of occupational crime include:

- Embezzlement;

- Money laundering;
- Altering company records without authorization;
- Committing tax fraud;
- Racketeering;
- Misusing company data or property; and
- Committing stock and securities violations.

These types of offenses are not always committed by a single individual, but often involve multiple employees, managers, supervisors, officers, and business owners. Regardless of how many people were involved the offense, most occupational crimes fall under a few different categories, including:

- Crimes of trust, or property crimes that involve deliberate contact with at least one victim or an attempt to conceal the fact that a crime has been committed;
- Offenses that were committed in the course of employment, such as accepting bribes;
- Crimes committed in furtherance of business operations, but not operations that are central to business purposes, such as misrepresentation in advertising; and
- Offenses in which crime is the central activity of the business, such as real estate fraud.

Occupational crimes are particularly common in certain professions. Over-billing by healthcare professionals, for example, is a common charge amongst medical professionals, while public officials and law enforcement officers are more at risk of being accused of offenses like bribery and corruption.

4.9 PROFESSIONAL RIGHTS

The basic rights of engineers include the right to live freely and pursue their legitimate interests as any human being, along with the right to be against racial or sexual discrimination, receiving one's salary according to the work, choosing of political activities, etc., as other employees. Besides all of them, engineers have some special rights as professionals.

Professional Rights:

The rights that engineers have as professionals are called Professional Rights. These professional rights include −

- The basic right of professional conscience.
- The right of conscientious refusal.
- The right of professional recognition.

Right of Professional Conscience

This is a basic right which explains that the decisions taken while carrying on with the duty, where they are taken in moral and ethical manner, cannot be opposed. The right of professional conscience is the moral right to exercise professional judgement in pursuing professional responsibilities. It requires autonomous moral judgement in trying to uncover the most morally reasonable courses of action, and the correct courses of action are not always obvious.

There are two general ways to justify the basic right of professional conscience.

- The exercise of moral reflection and conscience that justifies professional duties is necessary, with respect to that duty.
- The general duties to respect persons and rule-utilitarianism would accent the public good of allowing engineers to pursue their professional duties.

Right of Conscientious Refusal

The right of conscientious refusal is the right to refuse to engage in unethical behavior. This can be done solely because it feels unethical to the doer. This action might bring conflicts within the authority-based relationships.

The two main situations to be considered here are −

- When it is already stated that certain act is unethical in a widely shared agreement among all the employees.
- When there occurs disagreement among considerable number of people whether the act is unethical.

Hence it is understood that engineers and other professionals have a moral right to refuse the unethical acts such as bribery, forging documents, altering test results, lying, padding payrolls or coercing employees into acting by threatening, etc.

Right to Recognition

An engineer has a right to the recognition of one's work and accomplishments. An engineer also has right to speak about the work one does by maintaining confidentiality and can receive external recognition. The right for internal recognition which includes patents, promotions, raises etc. along with a fair remuneration, are also a part of it.

The fulfillment of right to recognition motivates the employee to be a trustful member of the organization, which also benefits the employer. This makes the employee morally bound which enhances the ethical nature to be abide by the professional ethics.

4.10 EMPLOYEE RIGHTS

An employee right can be any right, moral or legal, that involves the status of being an employee. They involve some professional rights also, such as the right to be paid according to the salary mentioned in one's contract. Privacy and equal opportunity can be considered essential rights too.

Privacy

The right to privacy refers to the right of having a private life, off the job. It is the right to control the access to and the use of information about oneself.

The examples of situations where the functions of employers conflict the rights of employees will be when the job-related queries or any other tests conducted in a job, includes questions relating to personal life such as alcohol usage or sexual conduct. The instances when a supervisor unlocks and checks the desk of his subordinate in his absence or when the management questions about his likes, dislikes or posts on social media regarding his personal opinions where it has nothing to do with the company.

Employers should view the relationship with their employees concerning confidentiality that cannot break the trust. The personal information in such cases is given based on the special professional relation and trust.

Equal Opportunity – Non-discrimination

The demeaning of a person based on trivial factors such as one's sex, race, skin color, age or political or religious outlook can be understood as Discrimination. Such a discrimination should never be allowed at any workplace; this is where everyone has to be treated equally. These things internally affect the person's self-identity and self-respect which is pernicious within the work environment, where the work itself should represent a person's self-image.

Equal Opportunity – Sexual Harassment

In today's world, there is an increase in the number of sexual harassment cases across the world. This is quiet an unfortunate scenario. There were a number of cases where the charges were levied since last two decades, which kept on growing. A definition of **Sexual harassment** is, "The unwanted imposition of sexual requirements in the

context of a relationship of unequal power". Sexual harassment is a display of power and aggression through sexual means. It takes two forms, quid pro quo and hostile work environment.

Quid Pro Quo includes cases where supervisors require sexual favors as a condition for some employment benefit (a job, promotion or raise). It can take the form of a sexual threat (of harm) or sexual offer (of a benefit in return for a benefit). **Hostile work Environment** by contrast, is any sexually oriented aspect of the workplace that threatens employee's rights to equal opportunity. It includes unwanted sexual proposals, lewd remarks, sexual leering, posting nude photos and inappropriate physical contact.

Equal opportunity – Affirmative Action

Affirmative action refers to the preference given to a person or a group who was denied equal importance in the past. For example, the women and the minority communities were not given equal treatment and were ill-treated in the past. So to compensate that, amendments were made in recent laws to provide them special quota for reservations in education, employment and social sectors.

These preferential treatments are made in order to compensate the previous ill-actions. Ideally such compensation should be given to those specific individuals who in the past were denied jobs. But the practical possibilities of such actions are limited. Sexism and racism still permeate in our society and to counterbalance their insidious impact reverse preferential treatment is warranted in order to ensure equal opportunity for minorities and women.

4.11 IPR DISCRIMINATION

Intellectual Property Rights:

Intellectual property right is a type of property right which allows the creators or owners of patents trademarks or copyrighted works to benefit from their own work or investment. These rights enable the right person to benefit from the protection of moral and material interests resulting from the authorship of scientific, literary or artistic productions. These rights are outlines in the article 27 of the Universal declaration of Human rights.

Protection of IPR:

Like the other rights, the intellectual rights also should be protected and supported. The IPR (Intellectual property Rights) need to be protected in order to serve the following reasons

- The creations and inventions are the paths which lead to the progress of human development, either in technology or culture.
- These inventions should be protected legally in order to develop the commitment and interest for more creations.
- These intellectual properties must be protected and promoted which indirectly promote the economic growth that creates new jobs and industries, and enhances the quality and enjoyment of life.

The Intellectual property rights are protected by certain measures like patents, trademarks, industrial designs, copyrights, etc.

Patents

A Patent is an exclusive right granted for an invention. It provides the patent owners with protection generally for a period of 20years. With the patent rights one can access any material reward for their marketable innovations.

Once the patent protection is granted, that invention cannot be commercially made, used, distributed or sold without the patent owner's consent. Courts provide the legal safety for these patent rights. Conversely, if a third party challenges the invention and is successful, the court can declare the patent invalid.

Trademarks

We often come across certain distinctive marks or signs that identifies certain goods or services produced or provided by an individual or a company. These trademarks ensure the belongingness of products to the authorized owners. The owners can authorize other persons in return for some payment. The protection offered through the trademarks is limited for a period, but can be renewed indefinitely upon payment of the corresponding fee.

These trademarks can be one or a combination of words, letters and numerals. They may even consist of drawings or signs such as shapes, colors, holograms, sizes or some non-visible signs such as smell, taste and sound also. The collective trademarks are owned by an association whose members use them to indicate products with a certain level of quality and who agree to adhere to specific requirements set by the association.

Industrial Designs

The ownership of an industrial design protects it from any duplication. Industrial designs are what make an article attractive and appealing and add commercial value to the product. This further increases marketability. Duplication will definitely mislead consumers and might also lead to the defamation of the original product.

Geographical Locations

The geographical location indications are helpful for the customers to identify the original and quality products, which are produced using the raw materials of that geographical area. This indication guarantees the customers that a product was produced in certain place and has certain characteristics that are due to the place of production. It may be used by all the producers who make products that share certain qualities in the place designated by a geographical location.

Some examples include "Brazil" for coffee beans, "Bordeaux" of France for wine, and "Habana" of Cuba for tobacco.

WIPO

The intellectual property rights are protected by an International organization called as the **World Intellectual Property Organization** (WIPO) which was established in 1970. This organization was established to ensure the protection of rights of creators and owners of Intellectual property across the world. The inventors and authors are therefore recognized and rewarded for their ingenuity.

Advantages of Intellectual Property Rights:

Intellectual property rights are advantageous in the following ways −

- Provides exclusive rights to the creators or inventors.
- Encourages individuals to distribute and share information and data instead of keeping it confidential.
- Provides legal defense and offers the creators the incentive of their work.
- Helps in social and financial development.

Intellectual Property Rights in India:

To protect the intellectual property rights in the Indian territory, India has defined the formation of constitutional, administrative and jurisdictive outline whether they imply the copyright, patent, trademark, industrial designs, or any other parts of the intellectual property rights.

Back in the year 1999, the government passed an important legislation based on international practices to safeguard the intellectual property rights. Let us have a glimpse of the same −

- The **Patents** (Amendment) Act, 1999, facilitates the establishment of the mail box system for filing patents. It offers exclusive marketing rights for a time period of five years.
- The **Trade Marks** Bill, 1999, replaced the Trade and Merchandise Marks Act, 1958
- The **Copyright** (Amendment) Act, 1999, was signed by the President of India.
- The ***sui generis*** legislation was approved and named as the Geographical Indications of Goods (Registration and Protection) Bill, 1999.
- The **Industrial Designs** Bill, 1999, replaced the Designs Act, 1911.
- The **Patents (Second Amendment)** Bill, 1999, for further amending the Patents Act of 1970 in compliance with the TRIPS.

National IPR Policy:

- The National Intellectual Property Rights (IPR) Policy 2016 was adopted in May 2016 as a vision document to guide future development of IPRs in the country.
- It's clarion call is **"Creative India; Innovative India"**.
- It encompasses and brings to a single platform all IPRs, taking into account all inter-linkages and thus aims to create and exploit synergies between all forms of intellectual property (IP), concerned statutes and agencies.
- It sets in place an **institutional mechanism for implementation**, monitoring and review. It aims to incorporate and adapt global best practices to the Indian scenario.
- **Department of Industrial Policy & Promotion (DIPP),** Ministry of Commerce, Government of India, has been appointed as the **nodal department** to coordinate, guide and oversee the implementation and future development of IPRs in India.

- The **'Cell for IPR Promotion & Management (CIPAM)'**, setup under the aegis of DIPP, is to be the **single point of reference** for implementation of the objectives of the National IPR Policy.
- India's IPR regime is in compliance with the WTO's agreement on **Trade-Related Aspects of Intellectual Property Rights (TRIPS)**.

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MODULE 5: RESPONSIBILITIES AND RIGHTS

Multinational Corporations- Environmental Ethics- Business Ethics- Computer Ethics -Role in Technological Development-Engineers as Managers- Consulting Engineers- Engineers as Expert witnesses and advisors-Moral leadership.

5.1 INTRODUCTION

Conducting business internationally involves more than currency, time and language differences. Different societies have different expectations regarding how things get done—what is permissible and what is not. Add to that variations in political and legal systems and competitive pressures and the line between ethical and unethical business practices can be difficult to identify. In this section, we will discuss the ethical issues of operating in a global environment and the laws, organizations and groups working to enforce codes of conduct and hold businesses responsible for their business practices and the health, safety and welfare of employees throughout their supply chain.

When a large corporation decides to enter a foreign market, it must usually secure a number of licenses, permits, registrations, or other government approvals. Certain types of business may be even be impossible or illegal unless the corporation is first able to obtain a change or adjustment to the nation's laws or regulations. Since the power to authorize the foreign corporation's activities is vested in the hands of local politicians and officials, and since corporations have access to large financial resources, it should not be surprising that some corporate executives resort to financial incentives to influence foreign officials. While certain financial incentives, such as promises to invest in local infrastructure, may be legitimate, any form of direct payment to the foreign official that is intended to influence that official's public decisions will cross the line into bribery.

In this chapter, let us the discuss the global issues concerning Engineering Ethics. The concept of globalization increases with the integration of nations through trade, investment, transfer of technology and exchange of ideas and culture.

So far as the engineers and companies are concerned, the Multinational Companies play crucial roles in promoting globalization. The ethics related to business, environment and computer will also be discussed in this chapter.

5.2 MULTI NATIONAL CORPORATIONS

A multinational company is one which is incorporated in one country (called the home country); but whose operations extend beyond the home country and which carries on business in other countries (called the host countries) in addition to the home country. It must be emphasized that the headquarters of a multinational company are located in the home country. Neil H. Jacoby defines a multinational company as follows: "A multinational corporation owns and manages business in two or more countries."

A multinational corporation is known by various names such as: global enterprise, international enterprise, world enterprise, transnational corporation etc.

Some popular examples of multinationals are given below:

FOREIGN MULTINATIONAL	INDIAN AFFILIATE / SUBSIDIARY
Bata Corporation	Bata India
Cadbury	Cadbury India
Coca-Cola Corporation	Coca Cola India
Unilever	Hindustan Lever
Timex	Timex Watches
Colgate Palmolive	Colgate India
Pepsi Corporation	Pepsi India
Philips	Philips India
Sony Corporation	Sony India
Suzuki	Maruti Suzuki
GEC	GEC Alsthom
ABB	ABB India

Features of Multinational Corporations (MNCs):

Following are the salient features of MNCs:

(i) Huge Assets and Turnover:
Because of operations on a global basis, MNCs have huge physical and financial assets. This also results in huge turnover (sales) of MNCs. In fact, in terms of assets and turnover, many MNCs are bigger than national economies of several countries.

(ii) International Operations Through a Network of Branches:
MNCs have production and marketing operations in several countries; operating through a network of branches, subsidiaries and affiliates in host countries.

(iii) Unity of Control:
MNCs are characterized by unity of control. MNCs control business activities of their branches in foreign countries through head office located in the home country. Managements of branches operate within the policy framework of the parent corporation.

(iv) Mighty Economic Power:
MNCs are powerful economic entities. They keep on adding to their economic power through constant mergers and acquisitions of companies, in host countries.

(v) Advanced and Sophisticated Technology:
Generally, a MNC has at its command advanced and sophisticated technology. It employs capital intensive technology in manufacturing and marketing.

(vi) Professional Management:
A MNC employs professionally trained managers to handle huge funds, advanced technology and international business operations.

(vii)Aggressive Advertising and Marketing:
MNCs spend huge sums of money on advertising and marketing to secure international business. This is, perhaps, the biggest strategy of success of MNCs. Because of this strategy, they are able to sell whatever products/services, they produce/generate.

(viii) Better Quality of Products:
A MNC has to compete on the world level. It, therefore, has to pay special attention to the quality of its products.

Advantages and Limitations of MNCs:

Advantages of MNCs from the Viewpoint of Host Country

We propose to examine the advantages and limitations of MNCs from the viewpoint of the host country. In fact, advantages of MNCs make for the case in favour of MNCs; while limitations of MNCs become the case against MNCs.

(i) Employment Generation:
MNCs create large scale employment opportunities in host countries. This is a big advantage of MNCs for countries; where there is a lot of unemployment.

(ii) Automatic Inflow of Foreign Capital:
MNCs bring in much needed capital for the rapid development of developing countries. In fact, with the entry of MNCs, inflow of foreign capital is automatic. As a result of the entry of MNCs, India e.g. has attracted foreign investment with several million dollars.

(iii) Proper Use of Idle Resources:
Because of their advanced technical knowledge, MNCs are in a position to properly utilise idle physical and human resources of the host country. This results in an increase in the National Income of the host country.

(iv) Improvement in Balance of Payment Position:
MNCs help the host countries to increase their exports. As such, they help the host country to improve upon its Balance of Payment position.

(vi) Technical Development:
MNCs carry the advantages of technical development 10 host countries. In fact, MNCs are a vehicle for transference of technical development from one country to another. Because of MNCs poor host countries also begin to develop technically.

(vii) Managerial Development:
MNCs employ latest management techniques. People employed by MNCs do a lot of research in management. In a way, they help to professionalize management along latest lines of management theory and practice. This leads to managerial development in host countries.

(viii) End of Local Monopolies:

The entry of MNCs leads to competition in the host countries. Local monopolies of host countries either start improving their products or reduce their prices. Thus MNCs put an end to exploitative practices of local monopolists. As a matter of fact, MNCs compel domestic companies to improve their efficiency and quality.

In India, many Indian companies acquired ISO-9000 quality certificates, due to fear of competition posed by MNCs.

(ix) Improvement in Standard of Living:
By providing super quality products and services, MNCs help to improve the standard of living of people of host countries.

(x) Promotion of international brotherhood and culture:
MNCs integrate economies of various nations with the world economy. Through their international dealings, MNCs promote international brotherhood and culture; and pave way for world peace and prosperity.

Limitations of MNCs from the Viewpoint of Host Country

(i) Danger for Domestic Industries:
MNCs, because of their vast economic power, pose a danger to domestic industries; which are still in the process of development. Domestic industries cannot face challenges posed by MNCs. Many domestic industries have to wind up, as a result of threat from MNCs. Thus MNCs give a setback to the economic growth of host countries.

(ii) Repatriation of Profits:
(Repatriation of profits means sending profits to their country).

MNCs earn huge profits. Repatriation of profits by MNCs adversely affects the foreign exchange reserves of the host country; which means that a large amount of foreign exchange goes out of the host country.

(iii) No Benefit to Poor People:
MNCs produce only those things, which are used by the rich. Therefore, poor people of host countries do not get, generally, any benefit, out of MNCs.

(iv) Danger to Independence:
Initially MNCs help the Government of the host country, in a number of ways; and then gradually start interfering in the political affairs of the host country. There is, then, an implicit danger to the independence of the host country, in the long-run.

(v) Disregard of the National Interests of the Host Country:
MNCs invest in most profitable sectors; and disregard the national goals and priorities of the host country. They do not care for the development of backward regions; and never care to solve chronic problems of the host country like unemployment and poverty.

(vi) Misuse of Mighty Status:
MNCs are powerful economic entities. They can afford to bear losses for a long while, in the hope of earning huge profits-once they have ended local competition and

achieved monopoly. This may be the dirties strategy of MNCs to wipe off local competitors from the host country.

(vii) Careless Exploitation of Natural Resources:
MNCs tend to use the natural resources of the host country carelessly. They cause rapid depletion of some of the non-renewable natural resources of the host country. In this way, MNCs cause a permanent damage to the economic development of the host country.

(viii) Selfish Promotion of Alien Culture:
MNCs tend to promote alien culture in host country to sell their products. They make people forget about their own cultural heritage. In India, e.g. MNCs have created a taste for synthetic food, soft drinks etc. This promotion of foreign culture by MNCs is injurious to the health of people also.

(ix) Exploitation of People, in a Systematic Manner:
MNCs join hands with big business houses of host country and emerge as powerful monopolies. This leads to concentration of economic power only in a few hands. Gradually these monopolies make it their birth right to exploit poor people and enrich themselves at the cost of the poor working class.

Advantages from the Viewpoint of the Home Country

Some of the advantages of the MNCs from the viewpoint of the home country are:

(i) MNCs usually get raw-materials and labour supplies from host countries at lower prices; specially when host countries are backward or developing economies.

(ii) MNCs can widen their market for goods by selling in host countries; and increase their profits. They usually have good earnings by way of dividends earned from operations in host countries.

(iii) Through operating in many countries and providing quality services, MNCs add to their international goodwill on which they can capitalize, in the long-run.

Limitations from the Viewpoint of the Home Country

Some of the limitations of MNCs from the viewpoint of home country may be:

(i) There may be loss of employment in the home country, due to spreading manufacturing and marketing operations in other countries.

(ii) MNCs face severe problems of managing cultural diversity. This might distract managements' attention from main business issues, causing loss to the home country.

(iii) MNCs may face severe competition from bigger MNCs in international markets. Their attention and finances might be more devoted to wasteful counter and competitive advertising; resulting in higher marketing costs and lesser profits for the home country.

Multinational Corporations in India:

MNCs have been operating in India even prior to Independence, like Singer, Parry, Philips, Unit- Lever, Proctor and Gamble. They either operated in the form of subsidiaries or entered into collaboration with Indian companies involving sale of technology as well as use of foreign brand names for the final products. The entry of MNCs in India was controlled by existing industrial policy statements, MRTP Act, and FERA. In the pre-reform period the operations of MNCs in India were restricted.

New Industrial Policy 1991 and Multinational Corporations

The New Industrial Policy 1991, removed the restrictions of entry to MNCs through various concessions. The amendment of FERA in 1993 provided further concession to MNCs in India.

At present MNCs in India can—
(i) Increase foreign equity up to 51 percent by remittances in foreign exchange in specified high priority areas. Subsequently MNCs are free to own a majority share in equity in most products.
(ii) Borrow money or accept deposit without the permission of Reserve Bank of India.
(iii) Transfer shares from one non-resident to another non-resident.
(iv) Disinvest equity at market rates on stock exchanges.
(v) Go for 100 percent foreign equity through the automatic route in Specified sectors.
(vi) Deal in immovable properties in India.
(vii) Carry on in India any activity of trading, commercial or industrial except a very small negative list.

Thus, MNCs have been placed at par with Indian Companies and would not be subjected to any special restrictions under FERA.

Criticisms against MNCs in India

The operations of MNCs in India have been opposed on the following grounds:

(i) They are interested more on mergers and acquisitions and not on fresh projects.
(ii) They have raised very large part of their financial resources from within the country.
(iii) They supply second hand plant and machinery declared obsolete in their country.
(i v) They are mainly profit oriented and have short term focus on quick profits. National interests and problems are generally ignored.
(v) They use expatriate management and personnel rather than competitive Indian Management.
(vi) Though they collect most of the capital from within the country, they have repatriated huge profits to their mother country.
(vii) They make no effort to adopt an appropriate technology suitable to the needs. Moreover, transfer of technology proves very costly.
(viii) Once an MNC gains foothold in a venture, it tries to increase its holding in order to become a majority shareholder.
(ix) Further, once financial liberalizations are in place and free movement is allowed, MNCs can estabilize the economy.
(x) They prefer to participate in the production of mass consumption and non-essential items.

5.3 ENVIRONMENTAL ETHICS

Environmental Ethics deal with issues related to the rights of individuals that are fundamental to life and well-being. These concern not only the needs of each person today, but also those who will come after us. It also deals with the rights of others living creatures that inhabit the Earth.

Globalization and industrialization have impacted the environment on a very large scale. The long term effects of the environment are usually neglected unless it is gross and immediate effect.

We are getting habituated to the ill-effects of pollution and industrial negligence shows on our environment. The aftermath can be seen in acid rains, water and land contamination, effect on crops and food sources, the cattle getting affected, the drying of lakes and canals, floods, drought, tsunamis and earthquakes due to drilling of underground wealth, the effect on marine being, the effect on ozone and the melting of snow mountains due to global warming, etc. The aftermath can be an alarming call for the required environmental changes.

Engineers need to show some responsibility towards the environment and should be ethical in their approach and find mitigating solutions for the protection of environment. Organizations should support the activities that promote environment protection. The **environment ethics** include −

- The study of moral issues concerning the environment
- Moral perspectives, beliefs and attitudes concerning those issues.

Ethical Guidelines to Work with Earth:

Various ethicists and philosophers proposed the following ethical guidelines to work with the earth (Miller 1996).

Ecosphere and Ecosystems:

1. We should not deplete or degrade the earth's physical, chemical or biological capital, which supports all life and all human economic activities.
2. We should try to understand and cooperate with rest of the nature.
3. We should work with rest of the nature to sustain the ecological integrity, biodiversity and adaptability of the earth's life support systems.
4. When we must alter nature to meet our needs or wants, we should choose methods that do the least possible harm to us and other living things.

5. Before we alter nature, we should carry out an Environmental Impact Assessment to evaluate proposed actions and discover how to inflict the minimum short – and long-term environmental harm.

Species and Cultures:

1. Every species has a right to live or at least struggle to live. Simply because it exists.
2. We should work to preserve as much of the earth's genetic variety as possible because it is the raw material for all future evolution.
3. We have the right to defend ourselves against individuals of species that do us harm and to use individuals of species to meet our vital needs but we should strive not to cause premature extinction of any wild species.
4. The best way to protect species and individuals of species is to protect the ecosystem in which they live and to help restore those we have degraded.
5. No human culture should become extinct because of our actions.

Individual Responsibility:

1. We should not inflict unnecessary suffering or pain on any animal we raise or hunt for food or use for scientific or other purposes.
2. We should use no more of the earth's resources than we need and not waste such resources.
3. We should leave the earth as good as—or better—than we found it.
4. We should work with the earth to help heal ecological wounds we have inflicted.

Two World Views on Environmental Ethics:

(a) Anthropocentric Worldview:
This view is guiding most industrial societies. It puts human beings in the center giving them the highest status. Man is considered to be most capable for managing the planet earth.

The guiding principles of this view are:

1. Man is the planet's most important species and is in the in- charge of the rest of the nature.
2. Earth has an unlimited supply of resources and it all belongs to us.
3. Economic growth is very good and more the growth, the better it is, because it raises our quality of life and the potential for economic growth is unlimited.
4. A healthy environment depends upon a healthy economy.
5. The success of mankind depends upon how good managers we are for deriving benefits for us from nature.

(b) Eco-centric Worldview:
This is based on earth-wisdom. The basic beliefs are as follows:

1. Nature exists not for human beings alone, but for all the species.
2. The earth resources are limited and they do not belong only to human beings.
3. Economic growth is good till it encourages earth-sustaining development and discourages earth-degrading development.
4. A healthy economy depends upon a healthy environment.
5. The success of mankind depends upon how best we can cooperate with the rest of the nature while trying to use the resources of nature for our benefit.

In 1985, Anil Agarwal published the first report on the Status of India's Environment. It emphasized that India's environmental problems were caused by the excessive consumption patterns of the rich that left the poor poorer. It was appreciated for the first time that tribal, especially women and other marginalized sectors of our society, were being left out of economic development.

There are multiple stake holders in Indian society who are dependent on different natural resources which cater directly or indirectly to their survival needs. Anil Agarwal brought forth a set of 8 propositions which are of great relevance to the ethical issues that are related to environmental concern.

This includes:

(i) Environmental destruction is largely caused by the consumption of the rich.
(ii) The worst suffers of environmental destruction are the poor.

(iii) Even where nature is being "recreated", as in afforestation, it is being transformed away from the needs of the poor and towards those of the rich.
(iv) Even among the poor, the worst suffers are the marginalized cultures and occupations and, most of all, women.
(v)There cannot be proper economic and social development without a holistic understanding of society and nature.
(vi) If we care for the poor, we cannot allow the Gross Nature Product (GNP) to be destroyed any further. Conserving and recreating nature has become our highest priority.
(vii) The Gross Nature Product will be enhanced only if we can arrest and reverse the growing alienation between the people and the common property resources. In this we will have to learn a lot from our traditional cultures.
(viii) It is totally inadequate to talk only of sustainable rural development, as the world conservation strategy does. We cannot save the rural environment or rural people dependent on it, unless we can bring about sustainable urban development.

5.4 BUSINESS ETHICS

The term 'Business Ethics' refers to the system of moral principles and rules of the conduct applied to business. Business being a social organ shall not be conducted in a way detrimental to the interests of the society and the business sector itself. Every profession or group frames certain do's and do not's for its members. The members are given a standard in which they are supposed to operate. These standards are influenced by the prevailing economic and social situations. The codes of conduct are periodically reviewed to suit the changing circumstances.

Definitions:

"Business Ethics is generally coming to know what is right or wrong in the work place and doing what is right. This is in regard to effects of products/services and in relationship with the stake holders." —Cater Mcnamara

"Business ethics in short can be defined as the systematic study of ethical matters pertaining to the business, industry or related activities, institutions and beliefs. Business ethics is the systematic handling of values in business and industry." — John Donaldson

There is no unanimity of opinion as to what constitutes business ethics. There are no separate ethics of business but every individual and organ in society should abide by certain moral orders.

Business ethics should take into consideration the following factors:

1. A business should aim to have fair dealing with everyone dealing with it.
2. Ethics should be fixed for everyone working in the organisation at any level and their implementation should be linked with reward- punishment system.
3. Any violation of ethics should be detected at the earliest and remedial measures taken immediately.
4. Business ethics should be based on broad guidelines of what should be done and what should be avoided.
5. The ethics should be based on the perception of what is right.

Sources of Business Ethic:

In every society there are three sources of business ethics-Religion, Culture and Law. The HR manager in every organisation, thus, has to be well versed with the unique system of values developed by these three sources.

These sources are discussed as follows:

1. Religion:

Religion is the oldest source of Religion is the oldest source of ethical inspiration. There are more than ethical inspirations. 1, 00,000 religions which exist across the whole world, but all of them are in agreement on the fundamental principles. Every religion gives an expression of what is wrong and right in business and other walks of life. The Principle of reciprocity towards one's fellow beings is found in all the religions. Great religions preach the necessity for an orderly social system and emphasize upon social responsibility with an objective to contribute to the general welfare. With these fundamentals, every religion creates its own code of conduct.

2. Culture:

Culture is the set of important understandings that members of a community share in common. It consists of a basic set of values, ideas, perceptions, preferences, concept of morality, code of conduct etc. which creates distinctiveness among human groups. When we talk about culture we typically refer to the pattern of development reflected in a society's pattern of knowledge, ideology, values, laws, social norms and day to day rituals. Depending upon the pattern and stage of development, culture differs from society to society. Moreover culture is passed from generation to generation. Culture facilitates the generation of commitment to something larger than one's individual self interest.

Culture encourages the members of the organisation to give priority to organizational goals over and above their personal interests. Culture also serves as a sense making and control mechanism that guides and shapes the attitudes and behaviour of people. Managers have to run an industrial enterprise on the cutting edge of cultural experience. The tension that their actions create makes the business ethically more complex.

3. Law:

The legal system of any country, guide the human behaviour in the society. Whatever, ethics the law defines are binding on the society. The society expects the business to abide by the law. Although it is expected that every business should be law abiding, seldom do the businesses adhere to the rules and regulations. Law breaking in business is common eg. Tax evasion, hoarding, adulteration, poor quality & high priced products, environment pollution etc.

Importance of Business Ethics:

1. Corresponds to Basic Human Needs:
The basic need of every human being is that they want to be a part of the organisation which they can respect and be proud of, because they perceive it to be ethical. Everybody likes to be associated with an organisation which the society respects as a honest and socially responsible organisation. The HR managers have to fulfill this basic need of the employees as well as their own basic need that they want to direct an ethical organisation. The basic needs of the employees as well as the managers compel the organizations to be ethically oriented.

2. Credibility in the Public:
Ethical values of an organisation create credibility in the public eye. People will like to buy the product of a company if they believe that the company is honest and is offering value for money. The public issues of such companies are bound to be a success. Because of this reason only the cola companies are spending huge sums of money on the advertisements now-a-days to convince the public that their products are safe and free from pesticides of any kind.

3. Credibility with the Employees:
When employees are convinced of the ethical values of the organisation they are working for, they hold the organisation in high esteem. It creates common goals, values and language. The HR manager will have credibility with the employees just

because the organisation has creditability in the eyes of the public. Perceived social uprightness and moral values can win the employees more than any other incentive plans.

4. Better Decision Making:
Respect for ethics will force a management to take various economic, social and ethical aspects into consideration while taking the decisions. Decision making will be better if the decisions are in the interest of the public, employees and company's own long term good.

5. Profitability:
Being ethical does not mean not making any profits. Every organisation has a responsibility towards itself also i.e., to earn profits. Ethical companies are bound to be successful and more profitable in the long run though in the short run they can lose money.

6. Protection of Society:
Ethics can protect the society in a better way than even the legal system of the country. Where law fails, ethics always succeed. The government cannot regulate all the activities that are harmful to the society. A HR manager, who is ethically sound, can reach out to agitated employees, more effectively than the police.

Characteristics of Business Ethics:

To understand business ethics, it is necessary to know it's important characteristics. These are:

(i) A Discipline:
Business ethics are the guiding principles of business function. It is the knowledge through which human behaviour is learnt in a business situation.

(ii) Ancient Concept:
Business ethics is an ancient concept. It has it origin with the development of human civilization.

(iii) Personal Dignity:
The principles of ethics develop the personal dignity. Many of the problems of ethics arise due to not giving dignity to individual. All the business decisions should be aimed by giving dignity to the customers, employees, distributors, shareholders and creditors, etc. otherwise they develop in immorality in the business conducts.

(iv) Related to Human Aspect:
Business ethics studies those activities, decisions and behaviours which are concerned with human aspect. It is the function of the business ethics to notify those

decisions to customers, owners of business, government, society, competitors and others on good or bad, proper or improper conduct of business.

(v) Study of Goals and Means:
Business ethics is the study of goals and means for the rational selection of sacred objects and their fulfillment. It accepts the principles of "Pure goals inspire for pure means" and "Means justifies the end". It is essential that goals and means should be based on morals.

(vi) Different from Social Responsibility:
Social responsibility mainly relates to the policies and functions of an enterprise, whereas business ethics to the conduct and behaviour of businessmen. But it is a fact that social responsibility of business and its policies is influenced by the business ethics.

(vii) Greater than Law:
Although the law approves various social decisions, but the law is not greater than ethics. Law is usually related to the minimum control of social customs whereas ethics gives importance to individual and social welfare actions.

5.5 COMPUTER ETHICS

Computers with Internet raise a host of difficult moral issues, many of them connected with basic moral concerns such as free speech, privacy, respect for property, informed consent and harm. To evaluate and deal with these issues, a new area of applied ethics called Computer Ethics has come up. These ethics are related to all the computer professionals such as programmers, analysts, operators, designers, etc. along with the users.

The ten commandments of Computer Ethics, created in 1992 by the Computer Ethics Institute consists of the following −

One should **never** use a computer −

- To harm the people (anti-social activities)
- To interfere with other's work (illegal manipulations)
- To snoop into other's files (malware)
- To steal a computer/data (hacking)
- To bear false witness (manipulation and morphing)

- To use/ copy a software you didn't pay for (like illegal downloads and usages)
- To use or copy other's software without compensations (illegal pirated versions)
- To use other's intellectual output inappropriately (violating IPR)
- Doing without thinking of social consequences of the program being written (libeling)
- Always use a computer ensuring consideration and respect towards fellow beings.

However, these ethics are facing lax in today's world. A very small section of concerned individuals seems to be following these ethics. A large section seems to be violating these ethics. With this, there is an unprecedented increase in cybercrime.

Role of Computers in Technological Development

In this section, we will discuss the role of Computers in Technological Development. The limitations of Internet usage and free speech are to be known clearly by every netizen. In this digital era, the morals expected from a human being are the basic tools that control the unethical and sleazy manner of handling the internet.

Internet which is now a global network of networks, initially used the infrastructure of the telephone system and is now being handled by many telecommunication systems by wire, fiber or wireless systems. The Internet provides a spring of new ways to be in contact with other people and with sources of information. It has also created greater convenience in ordering consumer items, paying bills and **social experiments** trading stocks and bonds. Like other major, it also has raised a host of new issues. One set of issues centers on free speech, including control of obscene forms of pornography, hate speech, spam which is unwanted commercial speech and libel. Computers contribute to greater centralization or decentralization insofar as human decision makers direct them.

There come issues which call for trouble wherein, computers are used in embezzlement and other forms of stealing money or financial assets. The issues concerning theft of software and information is again a similar one. The computers are centrally involved when an unauthorized person uses a telephone computer system to obtain private phone numbers or when maliciously alters or scrambles the programming of a telephone computer. In today's world, malicious people have come up with not one but various ways of exploiting money, goods, services, assets, etc. through the computers and internet. The Internet besides easing our work has also paved way to gather an individual's confidential details easily.

The two main factors that make computers troublesome are their speed and geographical coverage, which allows the masses to be victimized further. The

difficulty lies in tracing the underlying transactions to apprehend the thieves. This problem is compounded when the communication lines linking the computers involved cross national boundaries.

The most commonly discussed cases of computer abuse are instances such as −

- The stealing or cheating by employees at work.
- The stealing by non-employees or former employees.
- The stealing from or cheating clients and consumers.
- The violation of contracts for computers sales or services.
- The many conspiracies to use computer networks to engage in widespread fraud.

Alarmingly, the Internet has led to an explosion of identity theft, in which personal information is obtained and used to forge documents and commit fraud.

Privacy Factors

The misuse of Internet also influences privacy factors. The illegal attackers or hackers get access to restricted data which is a security threat.

- The inappropriate access which leads to security breach in an office leads to the leakage of confidential information which might severely affect the growth of the company.
- The hackers who crack the security and get unauthorized entry into the highly secured information zone, tend to copy the content or they may change the content, delete the content or get it affected with virus as soon as the authorized personnel opens the file.
- The different types of viruses such as Trojan Horse, Memory Resident, Overwrite, Browser Hijacker, Directory Virus, etc. can create instances wherein, the data on computer system get affected in various ways.
- The legitimate access to information is restricted to protect individual privacy, national security and freedom within a capitalist economy to protect proprietary information essential in pursuing corporate goals.

5.6 ENGINEERS AS MANAGERS

An engineer, whether he works individually or works for a company, has to go through some ethical issues, mostly under conditions such as, conceptualization of a product, issues arising in design and testing departments, or may be on the issues

involving the manufacturing, sales and services. An Engineer is responsible in promoting ethics in an organization, through framing organizational policies, responsibilities and by personal attitudes and obligations.

Suppose, an issue occurs which might lead to a conflict, an engineer or say a professional should respond pertaining to specific morals and professional ethics. An engineer should be able to work as a manager in such situations, resolving conflicts according to priorities, keeping the organizational benefits in mind. The issue must be resolved without hurting anyone's feelings and by developing a mutual understanding with subtlety. Not only the engineers who act as managers or the managers alone will share the responsibility, but there lies some social responsibility to stakeholders, customers and employers of a company. They act to develop wealth as well as the welfare of the society.

Ethicists project the view that the manager's responsibility is only to increase the profit of the organization, and only the engineers have the responsibility to protect the safety, health, and welfare of the public. But the manager, though an engineer or not, has the ethical responsibility to produce safe and good products (or useful service), while showing respect for fellow human beings including his employees, customers and the public. Hence, the objective for the managers and engineers is to produce valuable products that are also profitable.

Managing Conflicts

A conflict is a result of differences in opinions. Conflicts generally arise where the work is shared among more than one members. In fact, the situations of conflicts should be tolerated with patience, understood impartially and resolved by the participation by all the concerned.

When a project is distributed among a few members, the conflicts that generally occur are −

- The schedule based conflicts might occur at different levels of execution of a project, depending upon the priorities and limitations at each level.
- The prioritizing of projects or departments which can be arrived from end requirements may change from time to time.
- The deficiency of personnel availability for certain project completion in due time may also lead to a conflict.
- Conflicts that occur over technical, economic, and time factors such as cost, time, and performance level.
- Conflict arising in administration such as authority, responsibility, accountability, and logistics required.
- Conflicts of personality, human psychology and ego problems.
- Conflict over expenditure and its deviations.

Picking out on the personnel creating may keep others away from the problem and doesn't affect everyone. Such personnel can be trained again or given precautions. The interest of the personnel doing a project should be focused on the ethical attitudes and morals but not on their positions. In addition, the conflicts between the personnel, can be solved by the manager who has more ways to solve it. The evaluation of the results should be based on certain specified objectives such as efficiency, quality, and customer satisfaction.

Most of the conflicts can be resolved by following the principles listed here:

1. People

Separate people from the problem. It implies that the views of all concerned should be obtained. The questions such as what, why, and when the error was committed is more important than to know who committed it.

2. Interests

Focus must be only on interest i.e., the ethical attitudes or motives and not on the positions (i.e., stated views). A supplier may require commission larger than usual prevailing rate for an agricultural product. But the past analysis may tell us that the material is not cultivated regularly and the monsoon poses some additional risk towards the supply. Mutual interests must be respected to a maximum level. What is right is more important than who is right!

3. Options

Generate various options as solutions to the problem so that there is no time lag in decision making. This helps a manager to try the next best solution should the first one fails.

4. Evaluation

The evaluation of the results should be based on some specified objectives such as efficiency, quality, and customer satisfaction. More important is that the means, not only the goals, should be ethical.

Characteristics:

The characteristics of engineers as managers are:

1. Promote an ethical climate, through framing organization policies, responsibilities and by personal attitudes and obligations.

2. Resolving conflicts, by evolving priority, developing mutual understanding, generating various alternative solutions to problems.

3. Social responsibility to stakeholders, customers and employers. They act to develop wealth as well as the welfare of the society. Ethicists project the view that the manager's responsibility is only to increase the profit of the organization, and only the engineers have the responsibility to protect the safety, health, and welfare of the public.

But managers have the ethical responsibility to produce safe and good products (or useful service), while showing respect for the human beings who include the employees, customers and the public. Hence, the objective for the managers and engineers is to produce valuable products that are also profitable.

5.7 CONSULTING ENGINEERS

The consulting engineers work in private. There is no salary from the employers. But they charge fees from the sponsor and they have more freedom to decide on their projects. Still they have no absolute freedom, because they need to earn for their living.

The consulting engineers differ from the salaried engineers of an organization. These consulting engineers work in private and are paid per advice they offer or for the service they provide in a field of specialized knowledge or training. Consultants are individuals who typically work for themselves but may also be associated with a consulting firm.

Consultants can play a multi-faceted role; for example, they function as advisors, fixers, bosses, generalists, stabilizers, listeners, advisors, specialists, catalysts, managers or quasi-employees. Bringing in an expert can save time, effort and money. It has been estimated that approximately 3/4 of all companies call upon consultants at one time or another. Many companies claim that they receive a higher return for their invested dollars by using consultants for specific tasks.

A Consulting Engineer should maintain the ethical values in the profession, such as giving proper information without any ambiguities for advertisements, the allowance of small individual companies to participate in bidding and also maintaining clarity in the contingency fee which is previously agreed. The greater amount of job freedom enjoyed by consulting engineers as opposed to salaried engineers leads to wider areas of responsible decision making concerning safety.

The consulting engineers have ethical responsibilities different from the salaried engineers, as follows:

1. Advertising

The consulting engineers are directly responsible for advertising their services, even if they employ other consultants to assist them. But in many organizations, this responsibility is with the advertising executives and the personnel department.

They are allowed to advertise but to avoid deceptive ones. Deceptive advertising such as the following are prohibited:

(*a*) By white lies.

(*b*) Half-truth, e.g., a product has actually been tested as prototype, but it was claimed to have been already introduced in the market. An architect shows the photograph of the completed building with flowering trees around but actually the foundation of the building has been completed and there is no real garden.

(*c*) Exaggerated claims. The consultant might have played a small role in a well-known project. But they could claim to have played a major role.

(*d*) Making false suggestions. The reduction in cost might have been achieved along with the reduction in strength, but the strength details are hidden.

(e) Through vague wordings or slogans.

2. Competitive Bidding

It means offering a price, and get something in return for the service offered. The organizations have a pool of engineers. The expertise can be shared and the bidding is made more realistic. But the individual consultants have to develop creative designs and build their reputation steadily and carefully, over a period of time. The clients will have to choose between the reputed organizations and proven qualifications of the company and the expertise of the consultants. Although competent, the younger consultants are thus slightly at a disadvantage.

3. Contingency Fee

This is the fee or commission paid to the consultant, when one is successful in saving the expenses for the client. A sense of honesty and fairness is required in fixing this fee. The NSPE Code III 6 (*a*) says that the engineers shall not propose or accept a commission on a contingent basis where their judgment may be compromised.

The fee may be either as an agreed amount or a fixed percentage of the savings realized. But in the contingency fee-agreements, the judgment of the consultant may be biased. The consultant may be tempted to specify inferior materials or design methods to cut the construction cost. This fee may motivate the consultants to effect saving in the costs to the clients, through reasonably moral and technological means.

4. Safety and Client's Needs

The greater freedom for the consulting engineers in decision making on safety aspects, and difficulties concerning truthfulness are the matters to be given attention.

For example, in design-only projects, the consulting engineers may design something and have no role in the construction. Sometimes, difficulties may crop-up during construction due to non-availability of suitable materials, some shortcuts in construction, and lack of necessary and adequate supervision and inspection. Properly-trained supervision is needed, but may not happen, unless it is provided. Further, the contractor may not understand and/or be willing to modify the original design to serve the clients best.

A few on-site inspections by the consulting engineers will expose the deficiency in execution and save the workers, the public, and the environment that may be exposed to risk upon completion of the project. The NSPE codes on the advertisement by consultants provide some specific regulations.

The following are the activities prohibited in advertisement by consultant:

1. The use of statement containing misrepresentation or omission of a necessary fact.
2. Statement intended or likely to create an unjustified expectation.
3. Statement containing prediction of future (probable) success.
4. Statement intended or likely to attract clients, by the use of slogans or sensational language format.

5.8 ENGINEERS AS EXPERT WITNESSES

Frequently engineers are required to act as consultants and provide expert opinion and views in many legal cases of the past events. They are required to explain the causes of accidents, malfunctions and other technological behavior of structures, machines, and instruments, e.g., personal injury while using an instrument, defective product, traffic accident, structure or building collapse, and damage to the property, are some of the cases where testimonies are needed. The focus is on the past.

The engineers, who act as expert-witnesses, are likely to abuse their positions in the following manners:

1. Hired Guns

Mostly lawyers hire engineers to serve the interest of their clients. Lawyers are permitted and required to project the case in a way favorable to their clients. But the engineers have obligations to thoroughly examine the events and demonstrate their professional integrity to testify only the truth in the court. They do not serve the clients of the lawyers directly. The hired guns forward white lies and distortions, as demanded by the lawyers. They even withhold the information or shade the fact, to favor their clients.

2. Money Bias

Consultants may be influenced or prejudiced for monitory considerations, gain reputation and make a fortune.

3. Ego Bias

The assumption that the own side is innocent and the other side is guilty, is responsible for this behavior. An inordinate desire to serve one's client and get name and fame is another reason for this bias.

4. Sympathy Bias

Sympathy for the victim on the opposite side may upset the testimony. The integrity of the consultants will keep these biases away from the justice. The court also must obtain the balanced view of both sides, by examining the expert witnesses of lawyers on both sides, to remove a probable bias.

Duties

1. The expert-witness is required to exhibit the responsibility of *confidentiality* just as they do in the consulting roles. They can not divulge the findings of the investigation to the opposite side, unless it is required by the court of law.

2. More important is that as witness they are *not required to volunteer* evidence favorable to the opponent. They must answer questions truthfully, need not elaborate, and remain neutral until the details are asked for further.

3. They should be *objective* to discover the truth and communicate them honestly.

4. The stand of the experts depends on the *shared understanding* created within the society. The legal system should be respected and at the same time, they should act in conformance with the professional standards as obtained from the code of ethics.

5. The experts should earnestly be *impartial* in identifying and interpreting the observed data, recorded data, and the industrial standards. They should not distort the truth, even under pressure. Although they are hired by the lawyers, they do not serve the lawyers or their clients. They serve the justice. Many a time, their objective judgments will help the lawyer to put up the best defense for their clients.

5.9 ENGINEERS AS ADVISORS

The engineers are required to give their view on the future such as in planning, policy-making, which involves the technology. For example, should India expand nuclear power options or support traditional energy sources such as fossil fuels or alternative forms like solar and wind energy? In the recent past, this topic has created lot of fireworks, in the national media.

Various issues and requirements for engineers who act as advisors are:

1. Objectivity

The engineers should study the cost and benefits of all possible alternative means in objective manner, within the specified conditions and assumptions.

2. Study All Aspects

They have to study the economic viability (effectiveness), technical feasibility (efficiency), operational feasibility (skills) and social acceptability, which include environmental and ethical aspects, before formulating the policy.

3. Values

Engineers have to posses the qualities, such as (*a*) honesty, (*b*) competence (skills and expertise), (*c*) diligence (careful and alert) (*d*) loyalty in serving the interests of the clients and maintaining confidentiality, and (*e*) public trust, and respect for the common good, rather than serving only the interests of the clients or the political interests.

4. Technical Complexity

The arbitrary, unrealistic, and controversial assumptions made during the future planning that are overlooked or not verified, will lead to moral complexity. The study on future is full of uncertainties than the investigations on the past events. On the study of energy options, for example, assumptions on population increase, life style, urbanization, availability of local fossil resources, projected costs of generating alternative forms of energy, world political scenario, world military tensions and pressures from world organizations such as World Trade Organization (W.T.O.) and European Union (EU) may increase the complexity in judgment on future.

5. National Security

The proposed options should be aimed to strengthen the economy and security of the nation, besides safeguarding the natural resources and the environment from exploitation and degradation.

There may be various roles or models played by engineers who work as advisors. Let us now see what the roles or models are −

Hired Guns

This model highlights the client's wishes and acts accordingly. All the other factors are given less priority. Assumptions about uncertainties are inclined in a direction favorable to the client's case.

Value-Neutral Analysts

This model expresses the idea of being neutral and the avoidance of any form of advocacy towards anyone. The cost-benefit analyses if made, are to be done according to the value criteria, explicitly.

Value-Guided Advocates

This model advocates the idea that it is the responsibility of engineers to keep the public good in mind and maintain honesty about both technical facts and the values that guide their studies.

5.10 MORAL LEADERSHIP

Engineers, within their communities and professions contribute to technological process, as managers, business entrepreneurs, corporate consultants, academics and government officials they provide many forms of leadership in developing and implementing technology. Leadership can be understood as success in moving a group collectively, towards goals.

Moral leaders, are the individuals who direct, motivate, organize, creatively manage, or in other ways move groups towards morally valuable goals. Leaders might be in position of authority within a corporation, or they might not be. Leadership can be shown by individuals participating at all levels of organizations.

Morally creative leaders

Moral leaders are morally creative. This does not mean that they discover or improvise new moral values from scratch. Moral values are the product of centuries and millennia of gradual development, not instantaneous invention. Moral creativity consists in identifying the most important values that apply in a particular situation, bringing them into focus through effective communication within groups and forming workable commitments to implement them.

Moral creativity is achieving success through new ways of thinking with standard moral values. This is achieved by identifying new possibilities for applying, extending and putting values into practice rather than inventing new values for temporary comforts. But, this requires fresh moral insights with deeper commitments grounded in integrity.

Participation in Professional Societies

Professional Societies do more than just promoting continuing education for their members. They also serve to unify a profession, and to speak and act on behalf of it. Professional societies provide a forum for communicating, organizing and mobilizing change within and by large groups, which has a moral dimension. After

few incidents, many of the tensions existed in professional societies are because of the uncertainties about their involvement in moral issues.

Effective professional activity whether in Engineering or any other profession, requires a substantial degree of trust from clients and the public. Total absence of such trust would undermine the possibility of making contracts, engaging in cooperative work, exercising professional autonomy free of excessive regulation and working under humane conditions. Building and sustaining that trust is an important responsibility shared by all engineers. It is also an area where moral leadership within professional societies is really important.

Leadership in Communities

In communities and groups, the issues that bother and that are important should be informed to everyone. But the stronger obligations arise for those who by professional background are well grounded in specific issues as well as for those who have time to train themselves as Public advocates. It shows that there is certainly a need for moral leadership in identifying and expanding the areas of possible good that can be achieved.

Ideals of Voluntary service

The need for moral leadership in Engineering, emphasizes the need for involvement in professional societies and in community service. The leadership should have substantial involvement in professional societies which, in addition to furthering technical knowledge and representing engineers collectively, help establish high standards of moral integrity within the profession. The moral leadership should also have some involvement in community service. Moral leadership does not consist of moral elitism and dominance, but instead moral creativity in helping to guide, organize and stimulate groups toward morally desirable goals.

Reasons for Moral Leadership:

Moral leadership is essentially required for the engineers, for the reasons listed as follows:

1. It is leading a group of people towards the achievement of global and objectives. The goals as well as the means are to be moral. For example, Hitler and Stalin were leaders, but only in an instrumental sense and certainly not on moral sense.

2. The leadership shall direct and motivate the group to move through morally desirable ways.

3. They lead by thinking ahead in time, and morally creative towards new applications, extension and putting values into practice. 'Morally creative' means the

identification of the most important values as applicable to the situation, bringing clarity within the groups through proper communication, and putting those values into practice.

4. They sustain professional interest, among social diversity and cross-disciplinary complexity. They contribute to the professional societies, their professions, and to their communities. The moral leadership in engineering is manifested in leadership within the professional societies. The professional societies provide a forum for communication, and canvassing for change within and by groups.

5. *Voluntarism*: Another important avenue for providing moral leadership within communities, by the engineers is to promote services without fee or at reduced fees (pro bono) to the needy groups. The professional societies can also promote such activities among the engineers.

This type of voluntarism (or philanthropy) has been in practice in the fields of medicine, law and education. But many of the engineers are not self-employed as in the case of physicians and lawyers. The business institutions are encouraged to contribute a percentage of their services as free or at concessional rates for charitable purposes.

6. *Community service*: This is another platform for the engineers to exhibit their moral leadership.

The engineers can help in guiding, organizing, and stimulating the community toward morally- and environmentally-desirable goals. The corporate organizations have come forward to adopt villages and execute many social welfare schemes, towards this objective.

Sample Code of Conduct

The professional societies for engineers have formulated few codes of ethics which are expected to be followed by an engineer of the particular discipline. Following are a few societies that look into the discipline in Engineering −

- **NSPE** − National Society of Professional Engineers
- **IEEE** − The Institute of Electrical and Electronics engineering
- **AIChE** − American Institute of Chemical Engineers
- **ASCE** − American Society of Civil Engineers
- **ASME** − American Society of Mechanical Engineers

- **ACM/IEEE/CS** − Joint Task Force on Software Engineering Ethics and Professional Practices

All these societies have proposed different codes of ethics expecting adherence from the Engineers, to the highest standard of ethical conduct. This not only helps the societies but also the Engineers.

The **NSPE** (National Society of Professional Engineers) has formulated codes as engineering has a direct and vital impact on the quality of life for all the people. Accordingly, the services provided by engineers require honesty, impartiality, fairness and equity and must be dedicated to the protection of the public health, safety and welfare.

The fundamental things to be kept in mind, while engineers fulfill their professional duties are the following −

- Hold paramount the safety, health and welfare of the public.
- Perform services only in area of their competence.
- Issue public statements only in an objective and truthful manner.
- Act for each employer or client as faithful agents or trustees.
- Avoid deceptive acts.
- Conduct themselves honorably, responsibly, ethically and lawfully so as to enhance the honor, reputation and usefulness of the profession.

All the other societies have proposed the code of ethics to be followed in their respective disciplines, by the engineers. The professional ethics should be accompanied by moral concerns, in acting responsibly towards the profession while being in ethical limits.

The Codes of Ethics promote and sustain the ethical environment and assist in achieving the ethical goals in the following manner:

1. It creates an environment in a profession, where ethical behavior is the basic criterion.

2. It guides and reminds the person as to how to act, in any given situation.

3. It provides support to the individual, who is being pressurized or tortured by a superior or employer, to behave unethically.

4. Apart from professional societies, companies and universities have framed their own codes of ethics, based on the individual circumstances and specific mission of the organizations.

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