Motivations behind Software Piracy: From the viewpoint of Computer Ethics Theories
Abstract

Computer Ethics is a study of ethical issues that are related mainly with computing machines and computing profession. The features of internet that, it is global and interactive, it allows users to stay anonymous, and it enables reproducibility of information possible unlike before makes the online behavior morally different. Computer ethics studies the nature and social influence of computing machines and ethical issues in formulating and justification of policies.

Software Piracy, which is the unauthorized use or copying of software illegally, has become a major problem for businesses and it is widespread in many parts of the world which led to drain of economy. As the access to use computer grows, the percentage for using pirated software also grows. The Business Software Alliance (BSA) and the Software Publishers Association (SPA) made estimation (2010) that there are two-ten illegal copies of software are available for every legal copy of software sold.

Software piracy is one of the most remarkable among computer ethics’ breaches. Unlike other activities like hacking and security breaches, which are outright illegal, software piracy technically covers a gray area of ethical principles, as they relate to computers and information technology. This is because people might inadvertently commit the act without realizing that they are ethically/morally/legally wrong. When one buys software, it means that they actually are buying the software license but not the software. This is similar to artistic copyrights, where a composer/artist holds the license to his work and gains monetary compensation on a licensing basis. However, the ease with which the software can be copied makes it difficult to exercise licensing rights. One of the ways to counter software piracy is to understand the motivations behind it and create awareness.

The purpose of this research is to understand the principles of computing ethics in-depth and use this knowledge to understand what drives average people to commit acts of software piracy. The purpose is to use this information to create awareness among general public regarding software piracy.

Keywords: software piracy, computer ethics, unauthorized use of software
Foreword

This thesis was written for my Master of Science degree majoring in Information Processing Science at the University of Oulu.

I like to thank my supervisor, Senior Researcher Tero Vartiainen, from the Department of Information Processing Science for his support and for his annotations regarding the thesis. I appreciate the information and the guidance you have given me during the writing process. I would also like to thank the assessor of this thesis, Mr. Li Zhao for his valuable comments, explanations and suggestions. As well, I am grateful for the Department of Information processing science for giving me such an opportunity to further my knowledge and studies.

I would also like to thank everyone who has contributed their time to give several important comments starting from the beginning to the end process of writing.

Bethelhem Tadele

Oulu, May 9, 2014
Contents

Abstract ........................................................................................................................................... 2
Foreword .......................................................................................................................................... 3

1 INTRODUCTION ......................................................................................................................... 6
  1.1 Research Background ............................................................................................................. 6
  1.2 Purpose of the study ............................................................................................................... 7
  1.3 Research question and method ............................................................................................ 8
  1.4 Structure of the study ........................................................................................................... 8

2 THEORETICAL BASIS FOR COMPUTER ETHICS ................................................................. 9
  2.1 Ethics in Science and Engineering ....................................................................................... 9
  2.2 What constitutes Computer Ethics? ...................................................................................... 10
  2.3 Ethical theories and computer ethics .................................................................................... 11
  2.4 Virtual Ethics Theory .......................................................................................................... 12
    2.4.1 Modern Version of Virtue Ethics ................................................................................... 14
    2.4.2 Virtue Ethics in Science and Engineering .................................................................... 15
  2.5 Consequentialist Theories .................................................................................................... 16
    2.5.1 Intuitive Utilitarianism and Ideal Utilitarianism .......................................................... 17
    2.5.2 Act Utilitarianism and Rule Utilitarianism .................................................................. 18
    2.5.3 Utilitarianism and Software Piracy .............................................................................. 18
  2.6 Deontological Theories .......................................................................................................... 19
    2.6.1 Social Contract Theories .............................................................................................. 21
    2.6.2 Software Piracy from a deontological perspective ....................................................... 22

3 THEORIES OF COMPUTER ETHICS ....................................................................................... 23
  3.1 Weiner’s theoretical underpinning on computer ethics ...................................................... 23
  3.2 Computer Ethics Developments post Wiener and pre-Maner ............................................ 25
  3.3 Maner and Johnson: Computer Ethics and the Uniqueness Debate .................................. 26
  3.4 Gert and Moor on computer ethics ...................................................................................... 28
  3.5 Donald Gotterbarn’s definition ............................................................................................. 30
  3.6 Luciano Floridi’s information ethics ..................................................................................... 31
  3.7 Philip Brey’s disclosive method ............................................................................................ 32
    3.7.1 Bynum ......................................................................................................................... 33
  3.8 Computer ethics and software piracy .................................................................................... 34

4 SOFTWARE PIRACY .................................................................................................................. 35
  4.1 Intellectual property in a computerized world ..................................................................... 35
  4.2 Software as an Intellectual property .................................................................................... 35
  4.3 Temptations offered by computerization ............................................................................. 37
4.4 What constitutes Software Piracy? ................................................................. 38
  4.4.1 Effects of Piracy .................................................................................. 38
4.5 Modes of Piracy ......................................................................................... 39
4.6 History behind Software Piracy ................................................................. 42
  4.6.1 History of Software Piracy .................................................................. 42
  4.6.2 Free and open source software movements .................................... 44
5 FACTORS INFLUENCING SOFTWARE PIRACY ........................................ 46
  5.1 Public Awareness..................................................................................... 46
  5.2 High software prices ............................................................................. 47
  5.3 Risk of Penalty ....................................................................................... 47
  5.4 Opportunity ............................................................................................ 47
  5.5 Equity Theory ......................................................................................... 48
  5.6 Demographic Variables ....................................................................... 48
  5.7 Previous Behavior .................................................................................. 49
  5.8 Author’s Remoteness ........................................................................... 49
  5.9 Moral and social factors ....................................................................... 50
  5.10 Cross national perceptions of intellectual property ......................... 52
  5.11 Conclusion ............................................................................................ 54
6 MEASURES TO CREATE AWARENESS TO REDUCE SOFTWARE PIRACY .... 55
  6.1 James Rest’s four component model .................................................... 55
    6.1.1 Moral Sensitivity ............................................................................ 56
    6.1.2 Moral Judgment ............................................................................. 56
    6.1.3 Moral Motivation .......................................................................... 57
    6.1.4 Moral Action/Character ............................................................... 58
  6.2 Effective awareness using the four component model-summary .......... 59
7. DISCUSSION AND CONCLUSION ............................................................... 60
  7.1 Discussion – Motives behind software piracy .................................... 60
  7.2 Contributions of the study and limitations ........................................ 60
  7.3 Conclusion – Create effective awareness about software piracy ....... 61
REFERENCES .................................................................................................... 63
1 INTRODUCTION

The growth in computer technologies brought a wide range of complex social, ethical and value concerns. As the computer technology grows so the issues concerning privacy, property rights, accountability and social values (Johnson, 2004). Computer ethics usually consists of the use of computers. Moor (1985) explained about the computer ethics as such that computers helped human beings to do the things that they cannot do before the creation of computers which leads humans to policy vacuums where there is no clear ethical guidelines, rules and policies on how to act with regard to the new possibilities. Unauthorized copying is an example of those issues.

1.1 Research Background

Computers have become the core technology of our society in the modern day world. In a very short period of less than half a century, computers have become central to the operations of industrial societies. It is difficult to imagine a world without computers now. In fact, much of the current manufacturing industry, commerce, transport and logistics, government, the military, health services, education and research would grind to a halt if computer and computer networks are taken out of equation suddenly. However, as the human society becomes more dependent on computers, there is also a corresponding increase in vulnerability to computer malfunctions and misuse. The malfunction and misuse of computers have created a whole new range of social problems including but not limited to computer crime, software theft, hacking, the creation of harmful viruses, invasions of privacy, overreliance on machines and even new modes of workplace stress. Each of these problems also creates additional ethical dilemmas for both computer professionals and users. (Stamatellos, 2007)

To be fair, the crimes and ethical issues created due to the advent of computers are merely new versions of old moral issues. Computers, and hence, information technology has merely transformed the ways in which old ethical issues arise and added new twists to old problems. The main reason behind the complicated nature of issues arises from the fact that computers are essentially machines that can control other machines. Ethical issues in computing also arise from some of the revolutionary characteristics of IT. For instance, the arrival of new media such as e-mail have generated new ethical and legal issues concerning user identity, authenticity and the legal status of such communications. The powerful capabilities afforded by IT for monitoring, surveillance, and database searching have created yet another area that requires a close monitoring from an ethical and legal standpoint, as these can be easily used to spy on people and to profit from new scams. IT has allowed means of forming instant relationships between human beings, at the same it has transformed these relationships by impersonalizing human contact and replacing it with paperless communication, removing all personal traces of the sender. This has made it easier for people to commit fraud morally, as they feel they are not committing theft against a ‘real’ person. It is also technically easier to commit a fraud because the identity of the perpetrator is fluid and difficult to determine. Last but not the least, the ease with which computer software can be copied presents yet another ethical dilemma to computer users and professionals. (Forester, 1994; Stamatellos, 2007)
There are different views given by different researchers to the topic of software piracy. Most agreed on the definition of software piracy as it involves unauthorized copying of software, resale and reproduce it for an illegal use. (Stamatellos, 2007). Stamatellos has further stated that in many of the emerging nations more than 90% of new software is pirated. Further, a study conducted in 1997 revealed that in Eastern Europe and USA pirated software accounted for 75% and 35% respectively. Recent studies conducted in the area by business alliance software (BSA) revealed that about 57% of the world’s personal computer users admit to using pirated software. As expected, the figures were comparatively lower in USA at about 19% and were much higher in Central and Eastern Europe at about 62%. It can be seen that there has been a marked reduction in the use of pirated software in the last 15 years, however this reduction has only been slight and not comprehensive as one would have expected given the rise of global awareness due to the high rates of internet penetration. The research further showed that the global market for pirated software has grown to a staggering $63 billion, even though the global piracy rates for PC software stood at about 42%. (Business Software Alliance, 2011)

1.2 Purpose of the study

The purpose of this study is to carry an in depth analysis on the issue of software piracy as a moral issue. The definition of software piracy clearly states that it pertains to illegally copying software. Hence, the focus of this study would be on the reasons that motivate people to actually commit such an action. Morality itself has been defined in several different ways, each propone of the theory seemingly contradicting the other. The most obvious this is that the concept of morality depends on an individual’s perception of right and wrong. Obviously based on dissimilarities in the socio-economic and cultural conditions, morality is regarded differently in different regions of the world. As internet connects the world in a seamless manner, the differences in the concept of moralities now hold an almost sinister aspect.

In addition to ambiguity in morality, software piracy may also take place because of lack of awareness (Limayem, Khalifa & Chin, 2004). Not many people are aware of the exact consequences of their actions, in terms of monetary losses to the stakeholders. In fact not many people are even aware of the people who would be affected by their actions, as the crime is conducted with the least possible real-world physical activity. The action that led to people being a part of software piracy could be as simple as using the license number given by manufacturer at the time of purchase, to install the software on multiple systems or pass the number to their friends. Technically the same CD and license number have been used. As people have purchased the physical CD and the license number, they feel that they have the right to use it anywhere they like and any number of times. The legal usage rights in this case are entirely different than the legal usage rights of a physical item like a piece of jewelry, where the owner has the exclusive right to wear it whenever she wishes to and can loan it to whoever she wishes. Not many people are aware that in the same way that a single person can wear the piece of jewelry at any point of time, software package too can be used at one time, on one system, by a single person. This specific type of piracy can be prevented by conducting awareness of what constitutes the legal rights of a software package and how it is enforced.

In addition to understanding software piracy and its causes, the research also attempts to determine the ways in which awareness on the issue can be effectively created.
1.3 Research question and method

The focus of this research will be to provide an in-depth analysis of the previously stated purposes. As part of the research study, the following research questions would be addresses that specifically relate to morality and awareness of software piracy:

1. What constitutes software piracy?
2. What are the key factors influencing software piracy with respect to moral issues?
3. What measures should be done to create awareness about the issue?

The present research study is mostly exploratory in nature. The idea is to gather information that would give an in-depth understanding on the subject. The research questions would help in categorizing the study into specific areas that can be further analyzed in future researches.

1.4 Structure of the study

The rest of the paper is structured as follows. Chapter 2 will give the theoretical basis for computer ethics. Here various philosophical theories of ethics are discussed as they apply to engineering in general and computer software in particular. Chapter 3 explores the various theories of computer ethics in detail chronologically, exploring how the theories have altered over time. The growth and ubiquitous nature of computer software has revolutionized the concept of ownership and has prompted philosophers to modify and/or come up with newer theories of ethics, dealing with computers and the internet. The chapter presents an overview of such theories. Chapter 4 studies software piracy in general.

The advent of computers and the internet has given rise to newer ways of committing a crime. The most interesting and relevant amongst these is computer piracy because of the way it has impacted general ethical principles relating to ownership and thievery. Chapter 5 focuses on what constitutes software piracy and the factors that lead to people committing software piracy.

Software piracy is one of the widespread illegal activities conducted in the present day world. In fact, a recent study by Business Software Alliance (BSA) has found that 57% of 15,000 people surveyed across 33 countries admitted to using software without proper licensing (Fitzgerald, 2012). The widespread nature of software piracy is because many people do not understand or choose to disregard what constitutes software piracy, and feign/claim ignorance when asked about this. The solution to this is obviously to create general awareness among the public regarding software piracy. Chapter 6 assesses what measures needs to take to create awareness in order to reduce software piracy.

Chapter 7 presents a discussion on the topics covered in the dissertation which is essentially a fusion of the main topics in the research and the closing thoughts, restrictions and possibilities for further research.
2 THEORETICAL BASIS FOR COMPUTER ETHICS

Ethics is derived from the Greek word ‘ethos’ which means character or custom or disposition. The term is generally defined as the systematic study of morality and is considered to be one of the major branches of philosophy along with metaphysics, logic, and epistemology. Every human society practices ethics in some way because every society attaches a value on a continuum of good to bad, right to wrong, to an individual’s actions according to where the individual’s actions fall within the domain of that society’s rules and canons. Morality studies involve questions of practical reasoning such as freedom, privacy, equality, duty, obligations, and choice as well as justification of judgments, rights, and claims related to these terms. (Stamatellos, 2007; Kizza, 2013)

According to Kizza, the role of ethics is to help societies distinguish between right and wrong and to give each society a basis for justifying the judgment of human actions. Thus the purpose of ethics is to analyze the morality of human behaviors, policies, laws and social structures. (Kizza, 2013) Ethicists attempt to justify their moral judgments by reference to ethical principles of theories that attempt to capture moral intuitions about what is right and wrong. (Petković & Jonker, 2007) Kizza also defines ethics as a field of inquiry whose subject is human actions, collectively called human conduct, that are taken consciously willfully, and for which one can be held responsible. Kizza further cites the thoughts proposed by Fr. Austin Fagother that such acts must have knowledge, which signifies the presence of motive, be voluntary and have the freedom to signify the presence of free choice to act or not to act. (Kizza, 2013)

The definition of ethics and morality are not fixed and may vary as per circumstances. However, there are some universal rules that guide humans from all cultures at all times such as not killing, not stealing or lying. However, it must be remembered that in some cases, there is no universally correct way to behave and the choice of how to act must follow an analysis of alternatives and consequences derived from each choice. This is where ethical theories help in assessing what would be the most ethical behavior when facing a moral dilemma. An ethical theory determines if an action or set of actions is morally right or wrong. Codes of ethics have been drawn up based on ethical theories. In addition, ethical theories also describe the processes of reasoning, explanation and justification used in ethics. (Frize, 2012; Kizza, 2013)

This chapter presents a discussion on the relationship that ethics has with science and engineering, with a focus on computer technology. Traditional ethical theories have also been presented in the chapter, which have set the basis for the various theories and schools of thoughts specific to computing. These specific schools of thoughts will be covered in detail in Chapter 3.

2.1 Ethics in Science and Engineering

Science is generally thought to be objective and value neutral. If this is true, then ethics – as the systematic study of norms and values in human conduct – would seem to have only an external relationship to science. However, the value neutrality of science is a myth that can be successful challenged on critical reflection. Investments in science are justified by the goods science is alleged to bring, along with serving as a basis for better
personal and public decision-making. Indeed, scientific knowledge is linked to moral imperatives for action. Scientific knowledge is also seen as an intrinsic good, valuable in its own rights and as an expression of the human spirit or wonder and curiosity. Some even see the practice of scientific inquiry as an activity that depends on and cultivates intellectual and moral virtues such as honesty, integrity, trust, fairness, perseverance, sound judgment, and open-mindedness. Ethical standards or right conduct are thus intrinsic to science. For instance, scientists are ethically and morally obliged not to fabricate or falsify data, regardless of whether it is specifically stated in the rules of the institutions they are affiliated with or are working for. (Briggle & Mitcham, 2012)

Engineering ethics is the field of study focusing on the ethical aspects of the actions and decisions of engineers, both individually and collectively. A rather broad range of ethical issues are discussed in engineering ethics – professional codes of conduct, whistle-blowing, dealing with safety and risks, liability issues, conflicts of interests, multinational corporations, privacy etc. Several proponents of engineering ethics, especially in the United States, regard engineering ethics as professional ethics. The idea is that engineer as a professional has obligations not only to his or her employer but also to the general public in the same way that doctors or lawyers have obligations. Engineers are thus expected to adhere to professional codes of conduct that protect the safety and welfare of public as paramount. (van Gorp, 2005)

Principles of ethics and ethical codes thus lie at the core of the duties and responsibilities of engineering. Although there are small differences between the ethical codes of various jurisdictions, many of the core values are the same. Engineers are expected to review the codes of ethics in their jurisdictions regularly to ensure that they remain ethical in all their professional activities and keep up with changes as the codes when this occurs. Thus it can be seen that ethics is a dynamic concept which must be adapted from emerging issues as they arise. (Frize, 2012)

2.2 What constitutes Computer Ethics?

Computer ethics is a field of applied ethics that addresses ethical issues in the use, design, and management of information technology and in the formulation of ethical policies for its regulation in the society. (Brey & Søraker, 2009) Computer ethics analyzes the moral responsibilities of computer professionals and computer users and ethical issues in public policy for information technology development and use. (Brey, 2007) Because computing is a relatively new field, the emerging computer profession has had neither the time nor the organizational capability to establish a binding set of moral rules or ethics. Older professions like medicine and the law have had centuries to formulate their codes of ethics and professional conduct. Also unlike the practice of medicine or the law, the practice of computing extends outside the profession and also needs governance for the users of the system. Essentially the field is open with unfenced boundaries, which forms one of the major challenges for developing a uniform code of ethics that is universally acceptable. (Forester, 1994)

The pervasive and ubiquitous presence of computers in modern times is due to the versatility of computers. This has essentially led to an information revolution or more accurately computer revolution that has transformed several human activities and institutions beyond all recognition. Several unethical activities like deliberate invasion of privacy, defaming someone etc. have an electronic form as well. The advent of
internet makes the actions global in scale and hence more serious. Several new morally
controversial activities are also possible such as virtual child pornography where no real
children were abused. In all such cases, the task of computer ethics is to propose and
develop new ethical policies, ranging from explicit laws to informal guidelines, to guide
new types of actions that involve computers. (Brey & Søraker, 2009; Brey, 2012)

Due to the rapidly changing technology and the permeating presence of computers in
modern life, the task of computer ethics is ongoing and formidable. No other field of
ethics has these features to the degree that computer ethics does. Computer ethics is not
simply ethics applied to the field of computing. This is because typical problems in
computing ethics require more than straightforward application of ethical principles to
situations. A large amount of interpretation of behavior and existing policies is required
before appropriate actions can be formulated and justified. Not all ethical issues in
computing are difficult to understand, however. As an example, stealing a computer is
outright theft case that already has appropriate policies for counteractions and
punishment of the wrongdoer. However, offering license to a friend, free downloads of
movies etc. however are areas that pose challenges in terms of how to modify the policy
as well as actions such that the issue is effectively addressed. While other fields have
several ethical dilemmas, the field of computer ethics is set apart because of the
continually large number of evolving situations that are difficult to conceptualize clearly
in order to find and develop justified ethical policies. (Moor, 2004)

Members in the computer profession are like engineering who mostly work as
employees rather than in their own right. They have esoteric knowledge but quite
limited autonomy and often work in small teams on small segments of large projects
rather than alone. This creates even more distance from the final project they are
working on, making it easier to absolve them of any responsibility or wrong-doing. This
is a worrying scenario given that the widespread use of information technology for
strong all sorts of vital information puts considerable power in their hands, even if it is a
data entry operator. Computer professionals often find themselves in positions of power
over their employees, clients, coworkers and wider public and this power can be easily
abused if they are not made aware of their moral and ethical obligations. There are also
situations of conflict in terms of obligations and hence it is extremely important to focus
on the field of computer ethics to develop sound ethical foundations. (Forester, 1994)

2.3 Ethical theories and computer ethics

There exist many ethical theories, some of them dating from the time of Socrates, Plato
and Aristotle. In general the following areas of study are distinguished within ethics:

**Descriptive ethics:** – This concerns the discovery of the ethical views of specific
societies and speculative anthropological theorizing about the origin and function of
these views. (Martin, 2003) Descriptive ethics is essentially a careful articulation of
convention and is necessary because it is not always easy to intuitively know what
people believe. The best example of this is the fact that in general people believe in
protecting the environment. However, while they may clearly be interested in cleaning
their immediate surroundings, there is a major debate on the purchase and use of several
polluting products. Hence, unless clearly articulated, there may be significant
differences between the expressed and revealed preferences or beliefs. (Briggle &
Mitcham, 2012)
**Normative ethics**: – The field theorizes about the basic principles systematically distinguish the right from wrong etc. (Martin, 2003) Normative ethics attempts to formulate and defend basic understanding of the good, principles of right conduct, and the character of virtue. This is the kind of ethics that articulates reasons for what people should do and what they ought to believe. Needless to say, much of normative ethics comprises of what makes people, states of affairs, and actions, virtuous or vicious, good or bad, and right or wrong. Normative ethics field, from the point of view of researchers, can be theoretical or applied. The relationship between theory and contextual practices in ethics is however much debated. Some prefer the term practical ethics, arguing that moral reasoning is not as simple as applying principles of methods in deductive fashion. Others prefer case-based form of moral reasoning that beings with the particulars of context rather than with a predetermined theory. (Briggle & Mitcham, 2012)

**Applied ethics**: – An offshoot for normative ethics dealing with particular areas or disciplines such as medical ethics, business ethics, computer ethics etc. (Martin, 2003) Applied ethics is the area in which normative ethical theories get applied to specific problems within sufficiently well-defined areas of inquiry in order to give answers to particular questions. In applied ethics, one is concerned with the specific ethical issues that arise from the area being investigated, though there may be overlap between two separate areas of applied ethics. The idea of normative ethics is to identify morally appropriate courses of actions within a given context. Sometimes even meta-ethics concepts might be required to identify ethical course of actions. (Allhoff & Vaidya, 2008; Briggle & Mitcham, 2012)

**Meta-ethics**: – The study of the meaning of moral language and the possibility of ethical knowledge. (Martin, 2003) In contrast to descriptive ethic, this field involves analysis of meaning of central terms in ethics such as justice, virtue and obligation. In other words, meta-ethics examines the logic of moral reasoning. (Briggle & Mitcham, 2012)

In this chapter the focus is on the specific ethical theories that have more relevance to ethical decision-making in the field of computer technology, as per philosophers.

### 2.4 Virtual Ethics Theory

Virtual ethics is one of the oldest schools of thought in moral philosophy. Tracing its origins to Plato and Aristotle and spanning from the Fathers of the Church to contemporary feminist philosophy, virtue ethics has proven to be one of the most solid yet flexible ethical theories of the Western world. Aristotle laid out the roots for virtual ethics in two influential works – the Nicomachean Ethics and the Eudemian ethics. Ethics was essentially a practical science in the eyes of Aristotle, dealing with the character and behavior of the individual within the community. Virtual ethics essentially attempts to define the ethical virtues that human beings and human communities should aspire to exercise in order to be ethically sound. Virtual ethics is an ethical theory about the practice and development of the moral characteristics and practices that make human beings moral animals who aspire to the good. (Sicart, 2011)

In the original theory, Aristotle saw humans as beings oriented towards their happiness. The moral theory was based on the fundamental distinction between means and ends. Whereas means are acts done for the sake of something else, ends are activities done for their own sakes. There must be an end for all means, the final end being happiness.
In his famous book, Nicomachean Ethics, Aristotle stresses the development of moral virtues to direct humans to that end. Most of the discussion stresses the use of practical reason instead of theories, since Aristotle considers ethics to be a practical discipline. While he uses the basics of metaphysics and psychology to explain concepts of soul, Aristotle mostly focuses on the practical uses of these theories. Interestingly Aristotle divides the soul analytically into two parts – rational and irrational, including their respective faculties. The rational part of the soul has to aspects of reason the contemplative or speculative and deliberative. The irrational part include both the vegetative-nutritive part relating to body functions and the appetitive part i.e. the faculty of desire. This faculty is voluntary and rational in that it has the capacity to obey the will. However, desire is also irrational in that it lacks the capacity to deliberate and form reasons for action. This importance of this discussion immediately becomes clear when one bring illegal software downloads into picture. The desire for downloading software illegally is irrational but there can always be rational reasoning that people use to justify their behavior. (Smith, 2003)

Aristotle defines virtues as states of character that may or may not be realized in any given person. In other words, while virtues are qualities that are appropriate and right for people, give human nature, the capacities for them are actualized only through habituation. Hence, virtue ethics focuses on habits and abilities that an individual needs to acquire and practice in order to become a good human being. Mere performance of an action is insufficient for moral virtue, since actions must be as a just person would do them, with the knowledge that the acts are just, from the desire to do them for the sake of being just, and from the character of a just person. For performing just acts four moral virtues of prudence, temperance, justice and courage have to be developed. People who do not meet these conditions will be vicious to some degree and uncontrollable display passions such as anger, fear, longing or hatred. (Smith, 2003; Ess, 2011)

Hence, according to Aristotle good character is not an inherited trait. It is a whole settled set of habits and dispositions to act in accordance with virtues. Virtue ethics describes the character of a moral agent as a driving force for ethical behavior, rather than rules (as in deontology) consequentialism (which derives rightness or wrongness from the outcomes of the act itself rather than character), or social context (as in pragmatic ethics). (Smith, 2003; Johnson & Miller, Computer Ethics: Analyzing Information Technnology, 2012) As virtue ethics invokes a central human concern to care for and develop the self in relationship with other, it this provides ethical guidance and potential motivation to be ethical that can complement utilitarian and deontological approaches. At the same tome virtue ethics sidesteps some of the more over moralistic condemnation that some other approaches may lead to. (Ess, 2011)

Forms of virtual ethics are found in cultural and religious traditions around the globe. Virtue ethics also provides a cross-cultural connection to the Eastern world, because much of the ancient ethical thinking in the East, such as Confucianism, shares principles and rhetoric with virtue ethics. Hence, virtual ethics stands as a strong candidate for a global but pluralistic computer ethics for the networked or distributed selves facilitated by the existing and future computer and communication networks. Without being a Universalist theory, virtue ethics provides a framework that can be understood and translated into different societies across physical and cultural boundaries. This characteristic itself could arguably justify its use in the study of a global phenomenon like computer and the internet, in which the important of a global view of the world and culture is undeniable. (Sicart, 2011; Ess, 2011)
2.4.1 Modern Version of Virtue Ethics

The ancient concept of virtue ethics has undergone a revival in the fast few decades. The modern concept of virtue ethics puts primary importance on virtue-centered concepts rather than obligation-centered concepts. This revival can be traced to a paper ‘Modern Moral Philosophy’, published in 195 by G.E.M Anscombe. Anscombe puts forward the idea that modern moral philosophy is misguided because it depends on the existence of God. Her solution lies in the idea of eudaimonia, human flourishing, that does not depend on the existence of any God. In this sense, the philosophy is similar to Kantian ethics as well as utilitarianism. However, Kantian ethics and utilitarianism are still act-based and ignore the person who acts. Anscombe feels that this does not make sense because it ignores a belief people no longer hold. She also argues that act-based ethics stress the principle of autonomy and in doing so ignore the community aspect of morality. Anscombe’s paper struck a chord with many philosophers who had become dissatisfied with modern ethics and accepted her call for a return to virtural ethics. (Oliphant, AQA Religious Ethics for AS and A2, 2011)

Philippa Foot, a British philosopher, attempted to modernize Aristotle’s Virtue Ethics while still keeping the Aristotelian understanding of character and virtue. She believed that it is important for a person to employ his own reasoning while practicing virtue. In her view, virtues benefit an individual as they lead to flourishing of humans as living beings, and that a truly virtuous person does far more than merely conform to the conventions of the society. According to Foot, a wise person directs their will to what is good and a good is something that is both intrinsically and extrinsically good, as both motives and actions are important. Foot also believed that ethics should not be about dry theorizing but about making the world a better place. She also argued that virtues and skills are different things. We may make a mistake with a skill, but not damage our character or reputation, but someone deliberately and continuously acting in a non-virtuous, will damage their reputation and character. For Foot, virtues influence our characters until we become virtuous. These are correctives which mean that we should not characterize something as a virtue unless there is some sort of natural tendency to do otherwise. There are degrees of virtues – the person showing great personal restraint in the face of great temptation has greater personal courage than the person who is never tempted to do wrong. (Oliphant, 2013)

Anscombe’s influence was seen in the works of several later philosophers of virtue ethics, the most famous of which was Alasdair MacIntyre. In his book, After Virtue, Alasdair MacIntyre claims that ethical theories have simply resulted in ethical disagreements. This, according to him, is the reason why people do not think there are any moral truths and their belief in the idea that one opinion is as good as any other opinion. According to MacIntyre, present attitudes of most people are based on emotivism – moral statements are neither true nor false but simply expresses the feelings and attitudes of the speaker. He further adds that people have the tendency to act as if emotivism is true. (Oliphant, 2011)

MacIntyre was opposed to meta-ethics because in his view it divorced people from ethics. His basic complaint was that modern ethics put too much emphasis on reasons and not enough stress on people, their characters and contexts of their lives. Hence, his attempt was to resurrect thinking about virtue, arguing that modern ethics ended in virtual ended in ethical disagreements that left a moral vacuum in society. (Oliphant, 2013) This led to the development of the following three types of characters:
Bureaucratic manager e.g. Howard Schultz, the CEO of Starbucks
Rick aesthete e.g. Peter Strong fellow, a nightclub owner
Therapist e.g. Oprah Winfrey, a talk show host

(Oliphant, 2013)

MacIntyre believed that virtues are not fixed for all times but changed over time according to culture and context, so different qualities of character will be valued at different times. However, he believed that the three most important virtues are justice, courage and honesty, which must be practiced in order to achieve moral excellence. These three are core virtues that help to prevent organizations and institutions from becoming morally corrupt. The spread of morality was through institutions and so if institutions became corrupt, vices would be widespread. (Oliphant, 2013)

American philosopher Martha Nussbaum too attempted to interpret virtue ethics. Her approach was however different from most other philosophers including MacIntyre, who interpreted virtue ethics in a relative way. As seen above, the general idea that these philosophers held was that virtues depended on situations and even cultures. Nussbaum disagreed with these approaches and interpreted Aristotle's virtues as absolutes – she claims that justice, temperance, honesty, fidelity, and integrity are essential elements of human flourishing across all societies throughout time. In her view, these virtues are cross-culture and have withstood the test of time. Nussbaum is clear that she believes a relativist approach is incompatible with Aristotle’s virtue theory. (Keller, 2009; Oliphant, 2013)

2.4.2 Virtue Ethics in Science and Engineering

There are several ways in which virtue ethics relevant to science, engineering and technology. Virtue ethics attempts to understand the ethical beliefs in terms of the properties of moral agents. That is to say, knowledge is not the result of following a reliable method but is a result of the belief arising from intellectual virtue. As the agent is placed at the center of justification of the belief in virtue ethics, this is directly related to the way in which science and its applications are understood by researchers and practitioners. (James, 2004; Briggle & Mitcham, 2012)

Virtue ethics also highlights the importance of training processes and the mentor-mentee relationships. Aspiring scientist and engineering professionals, especially in the area of computer science, require mentors who can not only model the intellectual, but also moral virtues such as honesty, fair-mindedness, humility, and respectfulness. Virtual ethics is well positioned to criticize the existing tendency in the computer science field that has a tendency to attenuate the bonds between senior and junior professionals and researchers. The prevalence of computers also means that there is a reliance on virtuous practitioners and professionals who will not seek to employ unethical means that undermine the image of their professional community. This also serves to increase the trust on the society in the virtuous characters of professionals. (James, 2004; Briggle & Mitcham, 2012)

Virtue ethics also has its limitations, regardless to its relevance to the field of science, engineering and technology, as discussed above. First and foremost, virtue ethics focuses on individual agents and hence it is less suited for the evaluation of institutions and collective policymaking. This is a very crucial area in the field of computers and
internet. That is to say, while the field of computers and internet definitely required virtuous professions, it is also important to develop uniform codes of ethics and principles that guide regulations, considering the global nature of computing and digital business. For developing such general social policies, utilitarianism is often seen as a more pertinent normative theory. (Briggle & Mitcham, 2012)

2.5 Consequentialist Theories

A consequentialist theory tells people to choose the action with the best possible consequences. As seen above, virtue ethics focus on agents as a whole i.e. their character. In contrast, consequentialist ethics focuses on states of affairs that result from an agent’s actions. An act is right or wrong according to its consequences. It has no moral value apart from outcomes. An act is right, if and only if, it is reasonably expected to produce the greatest good or least harm in comparison with alternative action choices. Consequentialism this also requires some account of what counts as good. (Zwass, 1993; Briggle & Mitcham, 2012) A person is allowed to break existing rules, in a consequentialist system, only if the foreseeable consequences of that particular violation are better than the consequences of not breaking that system. However, the consequentialist system is concerned only with the foreseeable consequences of the particular violation, not the foreseeable consequences of that type of violation being publicly allowed. Thus consequentialism simply says that an action is right or wrong depending on its consequences, such as effects on the society. There is no concept of morally acceptable, only social good, in a consequentialist system. Needless to say, the approach is often difficult to apply because many times it leads to the interests of a minority being sacrificed to those of a majority. Also it is difficult to identify the majority and minority groups in many cases, along with that constitutes ‘good’ for the society and how to measure that ‘good’. (Forester, 1994; Spinello & Tavani, 2004) Generally speaking utilitarian followers are interested in only those social policies that produce the greatest good for the greatest number of individuals.

Utilitarianism, a form of consequentialism, was identified by J.S. Mill and Jeremy Bentham in the nineteenth century in an effort to develop a decision-making rule capable of guiding social policies in a world being transformed by science, technology and the Industrial Revolution. As the present world is going through another revolution due to the advent of the computer technology, it is important to understand the working and of this ethical theory. (Forester, 1994) In 1776, Bentham laid the foundation of the theory by proposing the fundamental axiom of the principle of utility, where is stated that the decision of right and wrong is measured by greatest happiness of the greatest number of people. He formulated the principle of utility five years later in 1781, which commends or objects to each and every action in accordance to whether the action benefits or harms the society, in terms of its happiness. Mills updated the principle in 1861 by including what it meant to be wrong – when actions produce the reverse of happiness. The period of development of utilitarianism was marked by the democratic development and social reform, which is the reason for the development of such a principle. (Singer, 2002) As the number of democratic societies in the world increased, utilitarianism became more influential. In one version or the other, utilitarianism is the basis of virtually all contemporary economics and much public policy formation. Policymakers at various governmental agencies commonly weigh the benefits and harm that may accrue from alternative regulatory actions and adopt those judged to produce the greatest overall benefits. (Briggle & Mitcham, 2012)
As discussed above, the basic principle of utilitarianism is that everyone should behave in such a way as to bring about the greatest happiness of the greatest number of people. A Utilitarian philosopher arrives at this cardinal principle by arguing that happiness is the ultimate good because everything else in life is desired as a means of achieving happiness. Happiness is the ultimate goal of humans, and thus all actions must be evaluated on the basis of whether they increase or decrease human happiness. An action is therefore right or wrong depending on whether it contributes to the sum total of human happiness. (Forester, 1994)

The concepts presented by Bentham and Mills form the classic utilitarianism theories. They are slightly different from each other and are considered as such. For Bentham, happiness is physical pleasure and hence his theory is often termed as hedonic utilitarianism. For Mill, happiness includes any need, desire, or interest that a person chooses to pursue and hence his theory is termed as preference utilitarianism. Mill’s preference utilitarianism has generally been adopted as the more rationally defensible, though not always. In twentieth century, preference utilitarianism underwent multiple updates giving rise to intuitional utilitarianism, ideal utilitarianism, act utilitarianism and rule utilitarianism. (Briggle & Mitcham, 2012)

2.5.1 Intuitional Utilitarianism and Ideal Utilitarianism

Utilitarianism post-classical definitions were first expanded by Henry Sidgwick. In his book ‘The Method of Ethics’, Sidgwick covered almost all the major issues of theoretical ethics and his was the most important work on moral philosophy in the nineteenth century. Sidgwick’s moral philosophy focused on the relationship between self-interest and altruism with an objective to discover some reasonable ground for disinterested observer. Sidgwick believed that it was right for an individual to sacrifice his happiness for the greater good of others. Hence his philosophy was termed as rational or intuitional utilitarianism. (Sheng & Sheng, 2004)

Theorists such as G.E. Moore suggested that instead of judging solely on pleasure or preferences, there are other goods that should be maximized. Moore is noted for his defining good as something undefinable, and also for his strong objection to naturalistic fallacy. These goods can be knowledge, friendship, health, aesthetic awareness etc. This is considered as ideal utilitarianism. The calculations may proceed in the same way but the emphasis has not shifted away from pleasure. (Edgar, 2002) Ideal utilitarianism invites one to separate discussion of the proposed ideal ends of action from discussion of its utilitarian or consequentialist account of moral obligation. Moore was opposed to the classical utilitarianism, especially Mill’s account of the philosophy. However, he had much respect for the points of views presented by Sidgwick, especially by what Sidgwick meant by ‘value’, though Moore did not always agree with Sidgwick’s perspective. He thought that Sidgwick still linked the value of beautiful things more closely than what was proper to their impact on human beings, denying that beauty had any intrinsic worth out of relation to human beings. (Scarre, 1996)

The term ideal utilitarianism was not given by Moore, but by Hasting Rashdall. Rashdall combined the utilitarian principle that ethics must be teleological with a non-hedonistic view of the ethical end. Rashdall had an anti-hedonistic nature and believed thatrightness or wrongness of actions was dependent on their ability to produce an ideal or good end for all mankind. This included pleasure, but was not limited to it, as...
suggested by Bentham. (Baldwin, 1999) The moral faculty for Rashdall is reason. He considers it as moral reason or practical reason which intuitively apprehends the highest good – virtue, knowledge, beauty and happiness. He termed his theory of utilitarianism as idea because it aimed at the maximum good in the individual life irrespective of the different moments. It also regards others’ good as of equal worth than one's own. Rashdall understands justice not on equal distribution, but as equitable distribution. (Stiphon, 2007)

2.5.2 Act Utilitarianism and Rule Utilitarianism

Act utilitarianism is a utilitarian theory of ethics which states that, when faced with a choice, one must first consider the likely consequences of potential actions and, from that, choose to do what he/she believes generates the most pleasure. Act-utilitarianism is an atomistic theory: the value effects of a single act on the world are decisive for its rightness. That is to say act-utilitarianism is the view that rightness or wrongness of an action is to be judged by the consequences, good or bad, of the action itself. It is not the principle that one should maximize total benefits, rather than one should maximize utility. Also act-utilitarian is not concerned solely with short-term benefit-to-harm radios, long-term consequences also have to be considered while making the decision. (Smart, 2000; Brandt, 2004; Snoeyenbos & Humber, 2008)

Rule utilitarianism is a form of utilitarianism that says that actions are moral when they conform to the rules that lead to the greatest good. In other words, rule utilitarianism is the view that rightness or wrongness of an action is to be judged by the goodness and badness of the consequences of a rule that everyone should perform the action in the like circumstances. Rule-utilitarianism applies to views, according to which rightness of an act is not fixed by its relative utility but by conformity with general rules. It is an organic theory – the rightness of individual acts can be ascertained only by assessing a whole social policy. An act is considered right if it follows a rule that generally produces at least the same proportion of good over bad as any alternative rule for all people affected. (Smart, 2000; Brandt, 2004; Snoeyenbos & Humber, 2008; Collins & O’Brien, 2011) A form of rule-utilitarianism was proposed by Richard B Brandt and Brad Hooker known as ideal-moral-code theory. The moral code in this variation is not universal, eternal, or intrinsically good. It is ideal for a society, if in practice, it would produce at least as much good per person as any other moral code. In rule utilitarianism there is a moral code but that code is subject ongoing calculations of aggregate utilities rather than accepted as lasting or universal. An idea moral code might be identified which results in greatest good per person, but as circumstances change, the calculus of good per person might require a change in the moral code. (Denhardt, 1988)

2.5.3 Utilitarianism and Software Piracy

Assessing software piracy from a utilitarian perspective gives very interesting and conflicting ideas. As the focus here is on the results of the action than the action itself, arguments can be made that an individual act of piracy is not unethical. For instance, an individual can significantly improve his or her productivity in the workplace by installing a pirated copy of a software program. While the employee completes the same amount of work in a single day, he/she can leave work earlier and spend more time with family, this increasing the happiness of multiple people. If the organization was not going to purchase the software under any circumstance, it is difficult to claim that
software owner is financially damaged, as no sale actually took place. If the company is as large as say Microsoft, the non-sale does not affect the overall profits and most likely would not outweigh the good created by the employee spending extra time with his family. The employee’s company is also happier, since they did not have to spend extra money on purchasing the software. In the end, the individual, his family, and even his company benefit, while the software creator is not significantly harmed. From utilitarian perspective, the benefits of a single case of piracy may in fact outweigh the cost, implying that the act is ethical in nature after all. (Gilbert, 2001; El-Sheikh, Rashed, & Peace, 2005)

At the first glance, the above analysis seems correct. In other words, it is possible to conclude that piracy results in the greatest good for the greatest number, because many users get the benefit of the software at little or no cost, while only those directly involved in producing it suffer any harm. The argument is strengthened when the cost of the software in low-income countries is considered. As people could not afford the software at its regular price, the benefit seems especially great, while the producers having more access to resources do not suffer a corresponding harm. Many people also cite the fact that much of software is overpriced, which probably makes it ok to illegally copy it when users can. However, at the same time utilitarianism also suggests different conclusion. If the consideration is extended to who benefits and who is harmed, the results are different. In this case, the question to be asked is what good a person would derive by using something that belongs to someone else without paying for it. Here the happiness or benefit is identified that comes from obtaining something for nothing. Also if the software is substituted by an actual tangible device like a laptop, would the same set of people judge it to be a good thing, even accounting for factors like overpriced brands and unaffordability in emerging nations? Also in the longer run, unchecked piracy would lead to significant losses to the software manufacturers who would not be interested in continuing with developing their product if there is no reasonable reimbursement for their efforts. Looking from this perspective software piracy does not actually yield the greatest good for the greatest number of people. (Gilbert, 2001)

2.6 Deontological Theories

The term deontology derives from the Greek words deon, which means duty and logos which means science. Etymologically, it means the science of duty. In current usage however its meaning is more specific. A deontological theory of ethics is one which holds that at least some acts are morally obligatory regardless of their positive or negative consequences on human beings. (Moriarty, 2008) Deontology falls into two categories as shown below:

**Act-deontology** – According to this theory, every judgment of moral obligation is based on its own merits. Act-deontologists decide separately the correct path to take and actions to do in each particular situation. This is a situation-specific deontological theory. While it is accepted that a decision can be reached on the basis of intuitive knowledge, it is argued that this relates to the specific situation. Despite being situation-specific, the decision is still based on intuitive values of rightness or goodness, not on any consideration of consequences. Many current theorists describe this as situational ethics and it is the view of ethics shared by many existentialists. (Kirby & Slevin, 2003; Kizza, 2013)
Rule-deontology – According to this theory, one’s duty in any situation is to act within rules, without exception. In this case too, the ethical decisions are not dependent on consequences, though unlike act-deontology, the decisions cannot be situation specific. Rather, rule-deontologists consider that universal rules apply on the basis on the universal intrinsic value or goodness of an act. This particular interpretation of ethics is promoted by Kant, as discussed below, and is the underlying principle adopted by most people who claim to be guided by conscience. (Kirby & Slevin, 2003; Kizza, 2013)

In contrast to consequentialist theories, the theory of deontological reason does not concern itself with the consequences of the action but rather with the will of the action. An action is good or bad depending on the will inherent in it. According to deontological theory, an act is considered good if the individual committing it had a good reason to do so. This theory has a duty attached to it. (Simons & Dewar, 2002)

German philosopher Immanuel Kant was the first thinker who systematically presented the main lines of a deontological position. In Kantian ethics, the objective principles of the universal moral law have the form of commands or imperatives. All imperatives are either hypothetical (i.e. if you want X, do Y) or categorical (do not do Y). Kant considers only categorical imperatives to be moral as they are the only ones that can reveal the absolute sense of duty and direct moral action towards the good. Using categorical imperatives Kant aims to establish a universal law valid for all rational moral agents. The criterion in all imperatives is their universality. (Stamatellos, 2007; Jaccard, 2013)

Kant based his ethical theory on the principle of duty and referred it to as the categorical imperative, as discussed above, as it pertains to actions that are universal and which arise from the sense of duty. Kantianism is rational because logic is used to explain why a solution to an ethical problem has been chosen. This theory produces universal moral guidelines that apply to all people at all times. All people must be treated as moral equals i.e. people in similar situations must be treated equally. Hence, Kantianism provides a framework to combat discrimination. A weakness in this theory is that it does not apply well to cases that are ambivalent or when there is a conflict between rules. Kantianism does not allow any exception to moral laws. This theory mainly supports moral decision-making on logical reasoning from facts and commonly held views. (Frize, 2012)

Deontological ethical theories reject the view that consequences themselves can be used as the appropriate criterion in determining whether a particular social policy is morally acceptable or unacceptable. Deontologists point out that it is possible for a policy to yield desirable consequences for the greatest number of people and still be a morally unacceptable policy. For deontologists, a social policy is morally acceptable only when everyone affected by that policy is respected as an individual and is given equal consideration. In this scheme, it is not morally permissible for some individuals to be used as a means to some further end. Rather, each individual is considered to be and end-in-himself/herself and deontologists argue that we have a moral duty to ensure that each individual is treated accordingly. (Tavani, 2006)

Deontological theories argue that it is always the duty of a person to do what is right. Individual actions should be such that they could serve as a model of behavior for others and in particular, one should always as one wishes others to act towards them. It is a fundamental duty of people to treat others with respect and not solely as a means to their own purposes. Treating others with respect means not to violate their rights and
meting out just treatment. (Kent & Williams, 1993)

In addition to Kantian version of the deontological theory, there is also a Thomistic version, given by Thomas Aquinas in the thirteenth century. Western religious traditions actively borrowed the philosophical ideas from the Greeks and combined them in various ways with the theological doctrines. Aquinas attempted to synthesize Christian theology with Aristotle’s science and ethics. The ethics of natural law and teleology has its greatest influence on Western though through Aquinas’s writing and the integration of science and Christianity. Aquinas interprets scientific and ethical teleology of Aristotle as evidence that a divine plant operates in nature. (Grčić, 2000) The laws of nature discovered in the Aristotelian tradition are combined with a religious world view and become the laws established by the creator of the natural world. In this ethical tradition, fulfilling one’s natural potential – a potential implicitly in harmony with the rest of nature – is the highest form of ethical activity for an individual. Natural law theory is still accepted today, especially by conservative thinker. Aquinas’s theory upholds the traditional ethic about property and thus has clear and more rigid morality expectations in case of intellectual property theft. (DesJardins, 2012)

2.6.1 Social Contract Theories

Several thinkers have reviewed ethics on the model of a social contract. There are many different social contract theories and several of these trace their origins to the deontological perspective. Philosophers such as Rousseau, Locke, Hobbes, and more recently Rawls are generally considered to be social contract theorists. They differ in how they get to the social contract and what it implies. Individuals are rational free agents and hence it is immoral to exert undue power over them. At the same time government and society treat individuals as means to social good, and hence are problematic institutions. Social contract theories explain this problem by claiming that morality is the outcome of rational agents agreeing to social rules, hence the name social contract. Individuals essentially freely agree to follow rules set by the government and the society, meaning that they are not coerced but freely choose to participate in the activity. Shared morality is what rational individuals agree as a group in order to make a social contract. (Johnson & Miller, 2004)

Most theorists agree that when rational individuals make a decision to follow a set of rule, they are influenced by their position in the society. Hence, they tend to opt for rules that would benefit their particular situation or characteristics. Thus most social contract theorists insist that the principles or rules of the social contract must be derived by assuming certain things about human nature or human conditions. Rawls, for instance, insists that people should imagine themselves behind a veil of ignorance, where one does not know about the important features about themselves. If people are extremely self-aware, they would not agree to just rules, only rules that would maximize their self-interest. Justice, in Rawls's view, consists of the rules that people would agree to when they do not know who they are because this would give them a fair situation no matter where they ended up in the society. (Johnson & Miller, 2004)

Rawls’s theory is a general theory intended to provide the moral foundation for a just and basic societal structure. Rawls does not explore particular institutional forms, legislation, or existing specific constitutions. He argues that some form of constitutional democracy is locally necessary to realize the first principle, but admits that even a
2.6.2 Software Piracy from a deontological perspective

Software piracy from a deontological perspective involves the question of whether moral rules concerning property also apply to software, whether or not it is a matter of theft and whether it could be morally right to levy some sort of tax on information carriers in order to compensate software producers for loss of income even though this may affect innocent people. (Jeurissen, Ethics & Business, 2007)

In fact observing things from a deontological perspective makes things clearer than if they were observed from utilitarian perspective, as shown above. Deontologists argue that the act itself is ethical or unethical, regardless of the outcomes. In case of piracy, the facts are clear. A software company has spent money in its research and development division to create the software. This is usually done to recoup the development costs and creates and income stream. These corporations legally create software licensing agreements into which purchasers enter voluntarily when they purchase the software. Those agreements, in most cases, prohibit the unauthorized copying of the software for purposes other than backing up the software. As the purchase is voluntary and certainly not a necessity of life, one can argue that the purchaser is ethically bound to abide by the licensing agreements. Further, one can also argue that as many individuals, of various backgrounds and cultures, have voluntarily purchased the software and abided by the licensing agreements, without major complaints, it can be taken as evidence that these licenses are accepted to be fair and ethical. In this case, copying software in violation of the agreement is unethical. This is exactly similar to any other contract between two parties, where both are in full knowledge of the situation and voluntarily enter into an agreement to abide by a set of rules. (El-Sheikh, Rashed, & Peace, 2005)
3 THEORIES OF COMPUTER ETHICS

There are numerous number of researches has been made and theories developed about computer ethics and software piracy.

3.1 Weiner’s theoretical underpinning on computer ethics

Computer ethics as a field of academic inquiry can be traced to the work of MIT Professor Norbert Wiener, who first foresaw the revolutionary social and ethical consequences of information technology. During the World War II, Wiener had helped to develop antiaircraft cannons that are capable of shooting down fast warplanes. This work resulted in Wiener and his colleagues creating a new area of research known as cybernetics – the science of information feedback systems. The concepts of cybernetics, along with nascent computer technologies available at the time prompted Wiener to analyze the field for its social and ethical consequences. (Goins, Fitzgerald, & Herold, 2009) Wiener’s achievements in cybernetics, communication theory, computer design, and other related fields had helped to bring about the current information age in the 1940s and 1950s. In addition, Wiener is also responsible for developing the basis for understanding current theories on computer and information age ethics. (Bynum, 2010)

Even as far back as in late 1940s and early 1950s, Wiener had made it clear that the integration of the newly invented computing and information technology into the society would lead to the remaking of the society, to what he called the second industrial revolution, to the automatic age. It would affect every walk of life, and would be a multifaceted ongoing process requiring decades of effort. Remarkably however, Wiener’s foundation of the computer ethics field was largely unknown by computer ethics scholar, until recently. Researchers attribute this to the fact that Wiener did not explore his concept in a systematic way and used it only sporadically as and when required in his writings. He did not bother with conducting research on these principles outside his books and hence they were part of the book, rather than components of a theory. (Bynum, 2008) This section discusses the highlights of the theory postulated by Wiener.

Based on this understanding of the Aristotelian philosophy, Wiener made the following important assumptions:

- All the process and objects in the universe comprise of matter/energy and information (Bynum, 2010)
- All animals are information-processing beings whose behavior depends of their processing and reasoning capabilities (Bynum, 2010)
- Humans, unlike other animals, have bodies that make the information processing in their central nervous system especially sophisticated. (Bynum, 2010)

Wiener then combined these assumptions with his extensive knowledge in philosophy, physics, biology, communication theory, information science and psychology. The result was an impressive philosophical and scientific foundation for today’s information ethics and computer ethics theories. (Bynum, 2010) Wiener explored these ideas first in his book ‘Cybernetics: or Control and Communication in the Animal and the Machine’. In this book he attempted to explain the key ideas of cybernetics and computing machines, as well the implications for physiology, medicine, psychology, and social theory. This
book had a few passages regarding ethics that aroused the interest of several readers. This encouraged Wiener to explore the aspect in depth and present his understanding in his follow-up book in 1950 titled ‘The Human Use of Human Beings: Cybernetics and Society’. Wiener devoted this book to the task of educating people about possible harms and future benefits that might result from computing and communications technologies. The book was the first discourse on the ethics issues raised by the rising use of sophisticated technologies. The convergence of computers and communication technology makes his book relevant even today. Wiener’s analysis can be applied to many different means of storing, processing, and transmitting information. (Bynum, 2008)

Wiener considered people to be social beings and hence by nature they were meant to live together. According to him, harmonious living in organized communities was necessary for people to have a good life. Within these communities human beings must be free to engage in creative flexible activities that utilize their potential as intelligent, decision making beings. Hence, in order for human being to lead a good, harmonious, and fulfilled life the society must have ethical policies or principles of justice, as Wiener referred to them, in order to protect individuals from oppression and maximize their freedom and opportunities. (Bynum, 2008) Wiener gave three such policies as outlined below:

- Each human being in the society must be liberated enough to have the freedom to explore his full extent of abilities, also known as the principle of freedom (Bynum, 2010)
- The social policies should be equal to everyone living within the community, also known as the principle of equality (Bynum, 2010)
- The actual goodwill existing between people of the society has no limits short of those of humanity itself, also known as the principle of benevolence (Bynum, 2010)

Wiener stated yet another social principle, which in his view minimizes social oppression and maximizes opportunities and choice. According to this principle, any societal or communal behavioral compulsion on an individual must be exercised in such a way that it does not cause unnecessary infringement of the individual’s freedom. This is also known as the principle of minimum infringement of freedom. (Bynum, 2010)

These conceptions given by Wiener are the tools with which Wiener explored the social and ethical impacts of information and communication technology. Using the principles of justice and the assumption of human nature, discussed above, as well as his critical skills in identifying vague or ambiguous language, Wiener achieved a very effective method for analyzing information ethics issues as given below:

- First identify the ethical question or case or dilemma regarding the integration of computers or IT into the society. Generally this type of situation arises due to the new possibilities generated as a result of technology integration affecting human life, health, security, happiness, freedom, knowledge, opportunities, or other key human values.
- After this the next step is to clarify any ambiguous or vague idea or principles that may apply to the case or issue in question.
- The next step is to apply already existing, ethically acceptable principles, laws, rules and practices that govern the human behavior in any society
If ethically acceptable precedents, traditions and policies are insufficient to settle the question or deal with the case, the solution should be found by taking in consideration the general purpose of human like and the principles of justice as well as possible ethical traditions of the given society.

(Bynum, 2008)

For any reasonably just society with available traditions, precedents and policies embedded in its social and cultural framework, it is reasonably easy to get solutions to ethical dilemmas using the above method. After the dilemma is sorted out or the questions are answered, the underlying principle used can be assimilated into the society. Looking at the steps given above, it obvious that solving information ethics problems does not require the expertise of a trained philosopher. Any adult who functions successfully in a reasonably just society is likely to be familiar with existing customer, practices, rules, and laws that govern the behavior of individuals in the society and can reasonably judge whether a proposed action or policy would be ethically acceptable. Wiener further adds that anyone who must cope with the newly introduced technology, be it public policy makers, computer professionals, business people, workers, teachers, parents or any others, can and should engage in information ethics by helping to integrate the new technology into the society in an ethically acceptable way. (Bynum, 2008)

3.2 Computer Ethics Developments post Wiener and pre-Maner

Wiener’s theories on information ethics were not limited to computers but covered a broad field in areas such as agent ethics, internet ethics, nanotechnology ethics, the ethics of bioengineering, journalism ethics and even library ethics. However, as mentioned his work was largely unknown until the late 1990s. In the meantime, growing computer ethics challenges, such as invasions privacy, threats to security and the appearance of computer-enabled crimes started to be noticed by policy makers and the general public. The first systematic study of unethical and illegal activities by computer professions was conducted in the mid-1960s by Don Parker, a computer scientist at SRI International at the time. Parker provided the first theoretical basis of ethics in computing, though like Wiener he never actually used the term. He presented the famous article ‘Rules of Ethics in Information Processing’ containing several example cases of computer crime. His work in the area was acknowledged when he was drafted by the Association for Computing Machinery, ACM to develop the first Code of Professional conduct, which was eventually adopted in 1973. (Bynum, 2008)

Park also conducted a research in 1977 to understand whether computer software professionals were able to identify unethical acts. Even after an intensive workshop, Parker found that there was a significant amount of disagreement on ethics issues. Further, a significant minority rigidly held to the belief that certain acts, including apparent computer abuse, did not have an ethics issue at all. According to Parker, the root cause of the problem is the existing computer education and training that encouraged or at least failed to criminalize certain types of unethical professional conduct. In fact in 1970s it was hard to convince anyone that computer ethics is anything other than an oxymoron. (Maner, 1996)

Another computer scientist who inadvertently played a role in explaining the scope of computer ethics was Joseph Weizenbaum, from MIT Boston. In 1960s, Weizenbaum created a computer program called ELIZA where he scripted a program that crudely
imitated a Rogerian psychotherapist engaged in an initial interview with a patient. Needless to say this enraged psychotherapists who feared that the program demonstrated that in near future computers would be able to successfully perform psychotherapy. This naturally upset Weizenbaum, who was concerned that a information-processing model of human beings was already reinforcing the tendency among scientists and even the public to see humans as mere machines. In response, Weizenbaum wrote the book ‘Computer Power and Human Reason’ in 1976 where is forcefully expressed his worries. According to Weizenbaum, computers should be given tasks that it can do best and leave those things to man that require judgment. In his book, Weizenbaum famously outlined several potential applications of artificial intelligence to be immoral – wiring of sensors to the visual cortexes of blind people, bionic ear etc. – applications that are already being used to general human benefit, without moral hazards. Nevertheless, his book, speeches and later words inspired a number of scholars to think about the social and ethical impacts of computing. (Forester, 1994; Hendersen, 2007; Bynum, 2008)

3.3 Maner and Johnson: Computer Ethics and the Uniqueness Debate

The literary works, speeches and articles by computer professionals between 1940s and 1970s showed that the computer crime, in fact the prevailing computing behavior was a growing concern for policymakers and the public alike. This increased the research interest in the area though the term ‘computer ethics’ did not exist till the mid-1970s. (Ess, Digital Media Ethics, 2013) Walter Maner is credited with coining this term when he was discussing the ethical issues and problems created by the computer technology, while teaching a course on the subject at Old Dominion University. Maner was a faculty member in Philosophy and noticed that in his medical ethics class that ethical problems became worse or were significantly altered when computers became involved. Maner further noticed that computers might even create new ethical problems that did not exist prior to their introduction. This interested him in the area as he examined and found that the same phenomenon took place in areas other than medicine. Maner thus concluded that a new branch of ethics was required to address the issue. Computer ethics, in his view, could be modelled upon medical ethics or business ethics, and philosophers should recognize this as a new and separate branch of ethics. He further used the phrase to develop an experimental course designed primarily for students of computer science, which proved to be a success, with Maner teaching the course on a regular basis. (Stamatellos, 2007; Bynum, 2008)

Maner collected his teaching experiences and his research in the proposed new field into a book ‘Starter Kit in Computer Ethics’ published in 1978. In his book, Maner developed a pedagogical framework for both teachers and students. The book comprises of curriculum materials as well as advice for developing computer ethics course. Many university courses on the subject can directly trace their beginnings to Maner’s published work. (Goins, Fitzgerald, & Herold, 2009)

While coining the term ‘computer ethics’, Maner pointed out that introducing computers technology into the society would give rise to the following types of ethical issues:

1. Aggravated traditional ethical problems like creating new avenues for invasion of privacy and theft. (Edgar, 2002)
2. Transform familiar ethical problems into analogies but unfamiliar ones. For instance, the criteria of ownership for an original artwork, photograph or literary work etc. (Edgar, 2002)

3. Create new problems that are unique to the computer realm such as those arising due to computers making strategic decisions in delicate areas such as battlefield, without human intervention. (Edgar, 2002)

4. A fourth possible, though rare case is that introducing new technology may relive existing moral problems. Maner was not very sure of how this would happen, but current thrust into the area of ‘Open Courseware’ by MIT that is committed to providing free knowledge to those who are interested in learning is a possible example as it removes the traditionally held ‘superiority’ that focused on sharing knowledge only between selected elite groups. (Edgar, 2002)

One of Maner’s colleagues on the Philosophy department, Deborah Johnson became interested in his newly proposed branch of applied ethics in computing. However, while she agreed that computer technology can aggravate or give a new twist to the original problems, she was skeptical of the notion that computers can generate wholly new ethical problems that have never been seen before. Johnsons presented her understanding of the subject in her famous book ‘Computer Ethics’ in 1985. This was the first major computer textbook ever and set the research agenda in the field of computer ethics for more than decade, including topics such as ownership of software and intellectual property, computing and privacy, responsibility of computer professionals, and the just distribution of technology and human power. In later edition of her book, Johnson added new ethical topics such as ‘hacking’ into people’s computers without their permission, computer technology for persons with disabilities, and the Internet’s impact upon democracy. (Bynum, 2010)

Both Maner and Johnson believed that the computer ethics understanding should use the applied philosophy approach. Both proposed using traditional ethical theories of philosophers, such as the utilitarian ethics of the English philosophers Jeremy Bentham and John Stuart Mill, or the rationalist ethics of the German philosopher Immanuel Kant. (Rogerson, 2011) However, Maner and Johnson actively disagreed on the subject of new ethical problems created by the introduction of computer technology. Their early conversations on the subject launched a decades-long series of comments and publications on the nature and the uniqueness of computer ethics – the ‘uniqueness debate’ – among computer scholars. (Bynum, 2008)

The uniqueness debate attempts of determine whether the moral issues confronting computer ethics are unique, and hence whether computer ethics should be developed as an independent field of ethics with a specific area of application and autonomous theoretical foundation. The traditional policy vacuum arising due to the fact that, computing is an extremely new and yet an extremely powerful, pervasive and invasive technology, has been interpreted by researchers in two different ways – radical and conservative, giving rise to the debate. The radical approach takes the view that computer ethics deals with absolutely unique issues and hence requires a completely new approach. Conservative approach believes that computer ethics is a microethics. The idea is that classical macroethics such as consequentialism, deontologism, virtue ethics and contractualism etc. are sufficient to cope with the policy vacuum. These theories might need to be adapted, enriched, and extended, but they all have the conceptual resources required to deal with computer ethics questions successful and satisfactorily. The conservatives agree that some ethical issues are entirely transformed
by the use of computing. However, in their view such issues represent only a new species of traditional moral issues to which available macroethics can successfully be applied, and hence computing ethics does not require the development of a new macroethical theory. (Floridi, 2013)

In his paper ‘Is Computer Unique?’ Maner not only presented his side of the debate, he also provided six levels of justifications studying computer ethics for the two views, as presented below. The first two are for the radical school of thought and the last four are for the second school. Professionals and users should study computer ethics because:

- It makes people behave like responsible professionals
- It helps people in avoiding computer abuse and catastrophe
- The rapid and continuous advance of computer technology ensures that there will be a policy vacuum in the field to some extent. Studying the field ensures that people are better prepared to deal with unforeseen dilemmas
- The rapid and continuous advance of computer technology might also transform certain ethical issues to the extent that their alternations require independent study. Studying the field ensures that people are aware of the basics of the field and expectations while conducting such a study.
- The rapid and continuous advance of computer technology might result in creation of novel ethical issues. Studying the field ensures that people are better able to deal with new ethical dilemmas
- A deeper understanding of computing ethics would provide understanding on the unique aspects of the subject. Maner considers that systematic study in the area would provide a large enough body of material that is coherent enough to define a new field

(Kizza, 2013)

3.4 Gert and Moor on computer ethics

In the same year that Johnson published her influential book, the first complete presentation of the nature of computer ethics was given by James Moor of Dartmouth College, appeared in his article ‘What is Computer Ethics?’ This article gave the first definition of the term computer ethics and presented the entire set of ethical problems possible in an information society. The article was the lead article in a special issue of the journal ‘Metaphilosophy’ in 1985, and gave an explanation of the nature of computer ethics in a way that was wider in scope than proposed by either Maner or Johnson. It went beyond the descriptions and examples of computer ethics problems and offered an explanation of why computing technology raised so many ethical questions compared to other technologies. His explanation was independent of any specific philosopher’s theory and was compatible with a wide variety of approaches to ethical problem solving. In fact, since it was proposed by Moor in 1985, this definition of computer ethics has been the most influential one. Computer ethics, according to Moor was a field comprising of policy vacuums and conceptual muddles regarding the social and ethical uses of information technology. (Bynum, 2008; Rogerson, 2011)

Moor felt that computing technology was genuinely revolutionary because it is ‘logically malleable’. This logically malleability of computer technology allowed people to do a wide variety of things that they were not able to do earlier. So the
question arises whether one ought to do a new thing possible as a result of computer technology. This is because Moor notes that simple because a person ‘can’ do something new does not mean that he/she ‘ought’ to do it or that it would be ‘ethical’ to do it. As it is reasonable to allow for the fact that as such things were not done in the past, there is no precedent of any law of standard of good practice or ethical rule governing such actions. These cases are called policy vacuums and can lead to conceptual muddles. Hence, according to Moor it is important to developing conceptual frameworks for understanding ethical problems involved in computer technology. Even when computing is merely doing old task in different ways, something new and important may nevertheless be happening. The old tasks may become informal in the sense that the processing of the information becomes a crucial ingredient in performing and understanding the activities themselves. This situation too creates conceptual muddles by changing the meanings and importance of old terms and needs to be clarified by introducing new policies or altering the existing ones. (Bynum, 2008)

The explanation given by Moor regarding the nature and cause of computer ethics problems is considered by many thinkers to be insightful and very effective in addressing several computer ethics issues such as privacy. Hence his is also the most influential account of the nature of computer ethics among a growing number of scholars. Moor further enhanced his theory of computer ethics by introducing the notion of core values such as life, health, happiness, security, resources, opportunities and knowledge that is essential for any community to survive. If a community does not value these things, it would likely cease to exist. With the help of some ethical ideas from Bernard Gert (discussed below) Moor added an account of justice, which he called ‘just consequentialism’ combining deontological and consequentialist ideas. A detailed discussion of different philosophies on ethics is presented in the later chapters. (Floridi, 2013)

Using this theory on computer ethics, Moor developed a creating and practical way of dealing with ethical issues. Moor’s problem solving method comprises of the following steps:

- First identify a policy vacuum generated by computing technology
- Then attempt to eliminate any conceptual muddles
- Finally use core values and the ethical resources of ‘just consequentialism’ to revise any existing policies or create new policies that would fill the vacuum and thereby resolve the original ethical problem.

(Bynum, 2008; Floridi, 2013)

In 1999, Bernard Gert published an influential article on computer ethics, introducing the now famous term ‘common morality’ – a shared moral system that people use to decide how to act when they face moral problem and in making their moral judgments. Gert developed his viewpoint because he believes that the standard ethical theories do not apply to moral issues involving computers and cyber-technology per se. In fact he feels that the standard ethical theories are inadequate models for understanding and analyzing everyday moral issues or ‘ordinary ethics’ problems. (Bynum, 2008)

In his view, accounts of morality provided by utilitarian and deontological theories are both artificial and simplistic and hence his proposal for common morality, where people make moral decisions or judgments almost subconsciously. Gert demonstrated how his system of common morality can be applied to a specific issue in software ethics – copying software for a friend. Gert remarks that disagreements on the morality of the
issue in this case may be caused by the fact that one of the partners involved in the disagreement has too narrow a description of the kind of violation to launch ethical thinking in the right direction. Such an action may be described as ‘helping friend’, ‘illegally copying software’ or ‘violating a morally acceptable law to gain some benefit’. However, Gert claims that no impartial rational person would publicly allow the act. Gert further adds that because there is far more agreement than disagreement on most moral matters, it is better to understand the reasons on why there is common agreement in these cases. Even when there is disagreement on some controversial issues, people should strive to find some common positions on these moral issues. Citing the different positions in the software copying example given above, Gert points out that, even if there are different views to a particular moral question, there are still many wrong answers. In this way, Gert avoids the charge of ethical relativism i.e. the view that any position is acceptable so long as one group or even one individual holds it. (Tavani, 2006; Bidgoli, 2006)

Moor’s theory differed from Gert as his proposed a scheme that incorporated that key features of utilitarianism and deontology into one comprehensive moral theory. While Gert felt that both these theories were of no use at all in solving everyday ethics issues and suggested a common moral theory, Moor combined all the three schools of thought and developed a unified moral theory that was comprehensive and could be tailored to answer all ethical questions – old, new or transformed. (Spinello & Tavani, 2004)

3.5 Donald Gotterbarn’s definition

The discussions on computer ethics above have one thing in common – they all advocate a broader view of the subject and recommend including as many social issues as possible in the definition. However, a section of academicians have argued for a narrower definition of computer ethics. In this context, the work of Donald Gotterbarn is foremost as he argues that computer ethics should really be about issues specific to the IT industry. In fact 1990s, Donald Gotterbarn became a strong advocate for a different approach to computer ethics. From his perspective, computer ethics should be viewed as a branch of professional ethics, concerned primarily with standards of good practice and codes of conduct for computing professionals. He makes the astute observation that the mere use of a computer in a crime does not make the crime a case for computer ethics. (Forester, 1994; Rogerson, 2011)

Gotterbarn defends his view by pointing out that an overbroad conception of computer ethics is unmanageable and that it makes for unsolvable problems. He presents several analogies to support his view. For instance, several technologies in the past have profoundly altered our lives, especially in the ways in which many people conduct their day-to-day affairs – the printing press, the automobile and the airplane. Despite the significant and even revolutionary effects of these technologies, neither of these field has their own ethics field like airplane ethics etc. taking a similar view, Gotterbarn argues that there is no need for a separate field of computing ethics at all. He also believes that focusing on the uniqueness and transforming effect of computing distracts the field from its proper focus – professional ethics. That is so say it is not the job of computer ethics to examine ethical issues other than those that effect computer professionals. In this connection, Gotterbarn and other theorists with similar views have emphasized the importance of articulating the nature and morality of computing as a profession. With his understanding of the nature of computer ethics, Gotterbarn actively created and participated in a variety of projects intended to advance professional responsibility
among computing professionals. His work resulted in the drafting of the Software Engineering Code of Ethics and Professional Practice by a joint task force of the IEEE and ACM. (Tavani, 2006; Volkman, 2013)

### 3.6 Luciano Floridi’s information ethics

Information ethics was defined by Luciano Floridi and his colleagues including Jeff Sanders, who took a radical perspective on computer ethics, taking in account the nature of computing as well as the presence of human and software agents in digital environments. Floridi’s view that information ethics like an environmental macroethics based on the concept of data entity than life is considered be one of the most original ideas in contemporary moral theory. It differs from traditional human-centered theories such as utilitarianism, Kantianism or virtue ethics. (Barker, 2010) Their concept of information ethics views itself as a macroethical approach, a framework that expands the responsibility of moral agents by defining existence as information existence – we, in fact all biological forms, are data entities. However, there are more data entries than life forms, such as artificial data entities that need to be respected and that can be harmed. Examples include databases containing our credit card data and records. All data entities share an environment that needs to be ethically protected. (Sicart, 2011)

As all existing objects are informational, Floridi calls the totality of all that exists i.e. the universe as a whole, as the infosphere. Objects and processes in the infosphere can be significantly damaged or destroyed by altering their characteristic data structures. Floridi calls such damage or destruction as ‘entropy’, which results in partial impoverishment of the infosphere. As such, there is a need to eliminate, avoid or minimize the entropy in the universe. From this perspective, Floridi has given four fundamental principles of information ethics:

1. The null law which states that entropy should not be cause in the infosphere at all.
2. Entropy should be prevented from occurring or increasing in the infosphere
3. Entropy should be removed from the infosphere, if possible
4. The growth and development of all informational objects in the infosphere should be done in a way that preserves, cultivates and enriches their properties.

(Bynum, 2008)

Floridi further considers that every object should have a minimum worth, moral worth, which must be ethically respected even if that worth is overridden by other considerations. By assigning moral worth to all entities in the universe, Floridi extends the reach of ethical attention to every object in the infosphere. According to Floridi, every entity, living or non-living, can be a potential agent that affects other entities as well as a potential patient that is in turn affected by other entities. The radical aspect of the theory is of course that non-living objects are considered to be worthy of ethical treatments, as well as potential agents of destruction. (Bynum, 2008)

As interesting as it might be, the information ethics theory is not without its critics. Matheisen has criticized such a theory as in his view a relation has to be specified between persons and information so that the information actually be of ethical import. (Al-Fedagi, 2006) Further, while Mikko Siponen praises Floridi’s theory for being bold and unconventional challenging the traditional beliefs about what constitutes moral
agreement, he is not convinced that information ethics theory with its focus on information entropy provides a better articulation of moral responsibility. In fact, Siponen believes that the information ethics theory is less pragmatic than theories like utilitarianism and the universalizability theses. Hence, according to him information ethics is an impractical mode of practical philosophy. Some other theorists like Stahl consider the theory sound but believe that in its current form, the information ethics theory cannot be universal. He suggests comparing the theory with discourse ethics of Habermas and Apel in order to extend discussion in areas where the information ethics theory has room for elaboration and development. (Gunkel, 2012)

3.7 Philip Brey’s disclosive method

Moor’s conception of computer ethics suffers from the following primary dilemma – computer ethics should be able to formulate policies to prevent invisible abuse or invisible programming of inappropriate values or invisible miscalculation. Dutch philosopher Philip Brey attempted to answer this challenge by calling for the field of computer ethics to become more disclosive and centrally concerned with the moral deciphering of computer technology. In his view, this would help in eliminating the invisibility factors. Brey has criticized mainstream computer ethics philosophies such as those proposed by Johnson’s and even Moor’s as being limited to analyzing ethical issues only when there is a previously known and identifiable policy vacuum. In his view, a true computer ethics philosophy should be able to address computer related practices that may not yet be morally controversial but that may have potential moral impacts in future. Brey considers such practices as being opaque. (Zimmer, 2007)

Brey’s conception of moral opacity arises due to two reasons. First is where people are unfamiliar with the computer related practices due to lack of experience or information. In this case, Brey considers that computer ethics must be able to recognize, examine, morally assess and develop policy guidelines. Second is where people are aware of the practice in its basic form but do not recognize its moral implications. Here, Brey cites the example of the multitude of computing related procedures that give the impression of being morally neutral but in reality are not. In his view, disclosive computer ethics should be able to put the technological artifact itself under moral scrutiny, independent of the specific ways of using the particular artifact. (Zimmer, 2007)

As the name suggests, disclosure computer ethics is an alternative methodology and the most crucial aspect of the corresponding framework is to disclose non-obvious features embedded in computer systems. In order to do this, Brey argues towards promoting an interdisciplinary and multi-level research on the subject. The reason for a multi-level research is because the research must be able to distinguish between three levels: disclosure level, theoretical level and application level. Disclosure level research requires inputs from computer professionals who have the technical expertise required to identify and thus to ‘disclose’ morally opaque features embedded in computer systems. Theoretical level research requires the expertise of philosophers to understand the conceptual aspects of the newly disclosed features at the previous level and determine if existing theories can be used as it is or they need to be revised or entirely new set of theories are required. This level can also be used to determine possible policy and conceptual vacuums. Application level research requires collaborative work from computer professionals, philosophers as well as social scientists in order to apply the ethical theory to the particular issues and practices that have been disclosed. (Spinello &
As a defense of his theory, Brey suggests two arguments that animate moral content in virtual acts. First, he believes that disrespecting virtual characters, i.e., a game player or even a web page owner may lead to a tendency to disrespect humans after a time. This argument has been widely criticized as both theoretically and empirically weak; in fact, Brey himself concedes the empirical point. Second, Brey argues that virtual acts have moral content in virtue of the potential for psychological harm that people may suffer from the knowledge that representations of things they care are not treated with respect. To some extent, even this argument is considered weak because of the large variety of computer or virtual artifacts that a person encounters in the virtual world. (Reynolds, 2012)

Brey has also been a critic of the information ethics theory presented by Floridi. He too, like other critics, credits Floridi for introducing a radical methodological founding of computer ethics. He further considers that the idea of extending moral philosophy beyond humans is promising. However, Brey finds that the theory as presented and argued by Floridi is less than persuasive in its current form and suggest modifications that would retain the important aspects of the theory. His chief objection to the theory is that he feels that no convincing arguments have been presented that prove that everything that exists has a minimum amount of intrinsic values. In his view, the theory makes much more sense if it is modified from a value-based theory to a respect-based theory. In other words, Brey suggests most (but not all) inanimate things in the world deserve moral respect, not because of intrinsic value, but because of their possible extrinsic, instrumental or emotional value to people. However, in doing so Brey brings the information ethics back to the anthropocentric point of view that was prevailing prior to Floridi’s theory. (Gunkel, 2012)

3.7.1 Bynum

In 1989, Terrell Ward Bynum developed another broad definition of computer ethics following a suggestion in Moor’s original paper. According to this view, computer ethics identifies and analyzes the impacts of information technology on social and human values like health, wealth, work, opportunity freedom, democracy, knowledge, privacy, security, and self-fulfillment. Solution generation is not covered by this definition. This very broad view of computer ethics employs applied ethics, sociology of computing, technology assessment, computer law, and related fields. It employs concepts, theories, and methodologies from these and other relevant disciplines. This conception of computer ethics is motivated by the belief that, eventually, information technology will profoundly affect everything that human beings hold dear. (Rogerson, 2011) Bynum is considered to have articulated the most extensive understanding of information and computer ethics. In his work, Bynum draws together the work of Floridi, Wiener, and other prominent contributions of the computer ethics. His account of the subject is still considered to be the most comprehensive such effort in Western philosophy. In his work, Bynum also incorporates important Eastern insights with the objective of developing a genuinely global information ethics that will recognize and presence local cultural norms and values, both Western and non-Western. (Hongladarom & Ess, 2007)
As mentioned above, Bynum’s approach to computer ethics is based on Wiener’s conceptions, though he includes recent physics and cosmology results and an alternative foundation by Floridi. In Bynum’s view, computer ethics is a separate field. In his view, computer ethics is merely a subset of information ethics, which will become the dominant theme in human ethical considerations. (Adams & McCrindle, 2008)

### 3.8 Computer ethics and software piracy

Computers and information technology, in tandem with internet and mobile technology, have permeated every aspect of modern society. The advent of the technologies has revolutionized the way in which information is generated, shared, disseminated and sold. Hence, computer ethics has emerged as a separate academic discipline. Computer ethics covers a broad range of issues such as privacy, integrity, trustworthiness, software reliability, data storage, security breaches, hacking, viruses, and recognizing the intellectual property rights of others (Woodcock & Murugesan, 2005). The most serious amongst these issues is the acknowledgement of intellectual property of owners. This is because while issues such as security breaches, hacking, privacy breaches etc. are rampant and constitute a serious problems, even the most non-technical person realizes that a breach is ethically, morally and legally wrong. This is ironically not true in case of intellectual property. While regular people would not even consider using someone’s physical property without appropriate permissions or even copy artistic creations without admitting to forgery, ironically they do not extend these principles to unauthorized usage of software. Most people seem to consider that copying software from a friend is merely ‘saving’ money, but not ‘stealing’. This presents a very interesting area of ethical breach, because people committing such frauds are usually average law abiding citizens, with a strong grasp of right and wrong. The next chapter deals explore software piracy from a computer ethics’ viewpoint to understand what drives ordinary people to commit such a fraud and how the issue can be dealt with.
4 SOFTWARE PIRACY

Software piracy is, in this case, defined as an illegal copying of software in a general case. Unauthorized use of software is practiced with in people who are in organizations or individuals for different purposes. For pirating software, there is no age limit or proficiency level of difference but the one thing that differs is the degree of the motivation to pirate software. (Craig & Honick, 2005)

4.1 Intellectual property in a computerized world

Before entering into the debate it must be understood that software can be expensive to produce. A substantial piece of software like database management system or an operating system can take many hundreds of person-years of effort to produce and a large team of engineering to maintain and evolve the software afterward. There has to be a mechanism to pay for this cost. (Hall, Fernandez-Ramil, Carlos, & Ramil, 2007)

Property ownership is a fundamental concept in most well-ordered societies. However, the definition of property is not always clear cut, especially when it comes to intellectual property as compared to tangible property. Unlike tangible property, intellectual property refers to products of the mind e.g. music, literature, art, inventions, formulas and software. Since the notion of ownership is closely related to the notion of property, it is extremely important to clarify the nature of property usage that might be considered to be unethical and hence illegal. Again, in case of tangible property e.g. land or car, the use is exclusive as only one person can use it at a time. Further, the usage of property leads to wear and tear, for which the owner may reasonably expect compensation. Intellectual property differs because it is non-exclusive i.e. many people can use it at the same time, and the use of it does not diminish its value because of wear and tear. Hence, the cost of providing additional access to it can be lower, even though the cost for producing the property might have been high. (Ricardo, 2011)

In order to understand who committed crime using software, it is first important to know if a crime was committed at all. This brings us to the murky area of intellectual property and extent of ownership rights to property in case of software and database. It is an extremely controversial issue with polarized views. On one side there are people who believe that virtually all non-personal information that could be useful to people should be freely available. Such people argue that intellectual property rights and laws should not apply to software. There is a strong ‘free software’ movement that supports the idea that all software should be free and available for free copying. At the opposing end are people who believe that every use of copyrighted works of all types, including transmission of them to personal computers for personal use is subject to copyright restrictions. Commercial software is usually protected by copyright and other means. The justification for such protection is based on notions of justice and the desire to foster enterprise. (Ricardo, 2011)

4.2 Software as an Intellectual property

Software solutions are IP-rich technology products and hence their usage is governed by various licensing models. Computer software is actually a type of intellectual property that has a physical form, because it may be listed on a paper or magnetic tape, CD or
disk i.e. to say it has a physical form. However, like art, software is still intangible. (Ahya, 2005) Generally developers of computer software seek legal protection for intellectual property by using traditional legal mechanisms found in copyright, trade secret, patent, trademark, and licensing.

Copyrights are limitations on the expression of an idea designed to protect anything that shows individual creative expressions. The copyright protection ‘automatically’ attaches to anything that an individual creates as soon as it is written down or recorded somewhere i.e. fixed in a tangible medium. Copyright protections can last from 90 to about 150 years depending on circumstances. Copyright licensing means that an individual grants the right to use his creative material i.e. unauthorized distribution of the copies of the copyrighted material within a specified geographical region e.g. a country is illegal. (Qu & Potkonjak, 2003) Trade secrets refer to the intellectual property that is absolutely critical to a company’s business and significant damage could result if it were disclosed to competitors and/or the public. Some of the well-known examples of trade secrets are the secret formula of Coca-Cola and the secret blend of herbs and spices of KFC. Many legal experts consider that trade secret protection to be the best way to protect software protects. The technique is used by large software development companies like Microsoft to protect its core base of computers. (Stewart, Chapple, & Gibson, 2012) Patents, on the other hand, are designed to protect the idea behind the item, not merely the particular form in which the idea appears.

These are essentially time-limited monopolies designed to protect inventions and technological developments. In this case the creator fully discloses the idea and is granted the ability to prevent anyone else from making, using, selling, offering for sale, or importing the invention. Patents last for about 20 years, after which the invention becomes part of the public domain. A trademark is a word, a phrase, a picture, a symbol, a shape of other means that identifies the product’s source. Apple’s trademark ‘bitten apple’ logo is world famous. Trademark is one of the most valuable assets for many companies acting as their chief marketing tool; again Apple’s logo is an excellent example of this. (Qu & Potkonjak, 2003) As can be seen, the term ‘intellectual property’ encompasses a number of divergent and even contradictory bodies of law.

Software is often used interchangeably to refer to both the computer operating software and the information contained in or described by the computer software. For instance, database consists of both the software and the data compilation itself. This compilation is essentially a literary work like a dictionary or catalog and is usually valued using similar methods. Many times the confusion related to software license infringement arises when these two aspects – software and data are viewed from the same perspective. (Ahya, 2005)

Most of the international laws related to intellectual protection of software think along the same lines. Software automatically becomes copyrighted as soon as it is created, with all rights belonging to the owner; there is no need for publishing. The owner can be a programmer or an employer, in case of a work for hire. It is illegal for anyone to make a copy of any program, unless specifically with owner’s permission or in the interests of fair use, in very limited cases. The documentation accompanying the software, such as the manuals, is also protected by copyright, regardless of whether they display a copyright symbol. Unauthorized copying is illegal in this case as well. Other products displaying a logo similar to the trademarked logo of the company to mislead the customers is also considered as an infringement, under the trademark law. Latest software is also equipped with various technical protection mechanisms to prevent
copying. Tampering with that device/mechanism or creating technology to facilitate tampering in order to circumvent the protection is also considered as a violation. (Ricardo, 2011)

When a person buys the software, he/she is actually buying a license to use the software, not the software itself, which remains the property of the owner. In essence, the customer leases the software. The terms of this lease are often displayed on an opening screen when the software is installed, and customer signifies agreement to the terms before installing the product. In general, the customer is allowed to make a single extra copy of the software for backup, but only copy of the program can be used at a time. In other words, while a person can have a back copy of the software, it is illegal to run this backup copy on a second computer at the same time the original is used. (Ricardo, 2011) There is a host of other illegal actions that constitute software piracy and will be discussed in detail in the next section.

4.3 Temptations offered by computerization

Prior to the advent of computers and hence its ubiquitous sibling Information Technology, there were few temptations that prompted unethical actions. People were either morally ambiguous or morally upright. The temptation to cheat and defraud was mostly either an action of a poor person earning his/her livelihood or a person trying to defraud a powerful authority figure, usually the government. The moral corruption on wide scale was limited to people of the highest echelons, who cornered the stakes in terms of power. However, computer and hence IT has revolutionized the world and extended the temptation in the hands of even the most common people, testing the ethical and moral values of average individuals. According to Richard Rubin, computer technology offers temptation to commit mischief in the following seven ways:

**Speed** – Computer allows information gathering and dissemination at extremely fast speeds, reducing the time required to carry out an action. This automatically decreases the chances of detection, tempting possible fraudsters to think that they can easily commit a crime and get away with it. (Kizza, 2013)

**Privacy and anonymity** – The ubiquitous nature of computer and especially the internet has an additional advantage of anonymity, when the user is savvy enough to use the right software package. Further, it is neither difficult nor expensive to get access to this type of software. All these factors make internet a very tempting environment for committing unethical acts. (Kizza, 2013)

**Nature of medium** – Unlike the paper medium, it is extremely easy to copy digital data without erasing or altering the original source in any form. Further the new copy is rarely distinguishable from the original, which means that little or no suspicion can attach to the stolen copy thereby encouraging unethical activities. (Kizza, 2013)

**Aesthetic attraction** – Users feel a great sense of achievement on doing a task that is complicated and has major consequences. In case of computer technology, doing such a feat is not as difficult as it would be if such a task was performed manually. For instance, breaking open a bank safe and breaking into the bank’s online secure system, offer similar rewards, but the latter is possible by a single technically savvy user, which means that would-be conmen tend to look consider the activity more like a challenge and less like an illegal activity. (Kizza, 2013)
**Increased availability of potential victims** – Unlike manual frauds, the widespread reach of computer networks, ensures that an individual can reach a large number of audience with the same effort. This creates an urge within people to perpetrate mischief that would affect an unprecedented audience. (Kizza, 2013)

**International scope** – In addition to the temptation of extending the geographical footprint of the fraud/crime, international crime also has the benefit of falling under a legal grey area. This means that the jurisdiction of the crime is not always clear making criminals think that if they have committed a crime in a different country, they cannot be prosecuted in their own country. A crime-without-punishment scenario is an irresistible temptation. (Kizza, 2013)

**The power to destroy** – Computers seems to have given the users and professionals an invisible power, if they understand how to use and control it. This creates a feeling of being omnipotent, which even according to the traditional theories of psychology is an irresistible temptation to even a normal person, urging them to commit acts that they would not have committed normally. (Kizza, 2013)

### 4.4 What constitutes Software Piracy?

Cho et. al. state that the attacks against software protection mechanisms can be classified into three types – software piracy, malicious reverse engineering, and tampering. They have further defined software piracy as the illegal distribution and/or reproduction of software application for business or personal use. Malicious reverse engineering can be done by using automated tools which can extract a valuable piece of code from an application and used by competitors. Software tampering constitutes an illicit modification of program file or attack against program integrity that might make the software unusable. (Cho, Chang, & Cho, 2008)

The work that is most often associated with piracy in modern times is software. An arcane concept before 1975, it is now a ubiquitous concept in the present generation. Software piracy, at the first glance, does not seem different from other copyrighted material. However, software is not really like other intellectual property. Books and even videotapes can be copied only by processes that are relatively time-consuming and expensive, and still there are ways to distinguish the original from the copied one. Software, on the other hand, is extremely easy to duplicate – many time, even regular citizens can do this using basic copy tool, and with very less effort. The end result is a perfect copy of the original that is very hard, if at all, to be distinguished from the original program. The rapid growth of computer networks has only compounded the program as it allows anyone with a computer and a modem to distribute software silently and instantaneously.

### 4.4.1 Effects of Piracy

The harmful effects of software piracy extend to developers, distributors and users.

Stealing software is such a simple and easy thing in modern times that it is difficult to consider this as an illegal activity, but it is. While people using/distributing illegal software do not consider about its harmful effects, software piracy has been conclusively shown to have a negative effect on the economy. Software production
employs millions of people and accounts for billions of dollars in revenue. Pirated software causes loss of revenue and tens of thousands of jobs are lost as a result of insufficient revenue. Decreased revenue can directly affect consumers as well because it leads to cost cutting measures in terms of reduced support. (Oja & Parsons, 2009) A discussion on the ways software piracy affects different stakeholders is presented below. Pirated software affects users in the following ways:

- Increased risk of spreading viruses.
- Lack of support – Illegal copies of software often do not contain manuals, so users may not productively use the software
- No warranty is provided, so the program cannot be expected to be reliable
- Software developers are less able to produce support to their legitimate customers
- Illegal software can only be upgraded through further illegal actions
- The possibility of hefty fines with criminal and civil proceedings

Pirated software affects software developers and distributors in the following ways:

- Reduces the sales and profits to the legitimate owner of the software package
- Reduces the opportunity for research and development of new/improved software
- Forces the developers to increase the price of the products to make a profit

(Lancaster, 2001)

4.5 Modes of Piracy

As discussed above, software piracy constitutes illegal or unauthorized reproduction, distribution or use of an organization’s internally developed software or application software or fonts for business or personal use. Purchasing software is different from buying other products. This is something like music – on making a purchase, music and in this case software applications and fonts do not belong to the buyer. The buyer merely becomes a licensed user. Also the license is limited to the number of systems on which the software can be installed. For instance, a single individual license allows the user the right to use the software on a single computer. The user does not have the right to put copies on other machines or pass that software to colleagues, friends or acquaintances. Whether the software piracy is deliberate or not, it is still illegal and punishable by law. The license agreement outlines the parameters of the permission to the user. This license agreement is known as End-User License Agreement or EULA. It is important that users understand the terms and conditions specified in EULA so that they do not inadvertently or deliberately breach the terms. (Godse & Godse, 2007)

Software piracy comes in many forms. The six basic forms of software piracy are discussed below:
**Softloading or Softlifting** – This is the most common type of piracy. The term softloading or Softlifting means sharing a program with someone who is not authorized by the license agreement to use it. Softlifting means when an individual loans his copy of the software to his friends who do not have authorization/license to use the software. Softloading means when an individual or an organization deliberately installs multiple copies of the software on different computer systems, in violation of the licensing terms. This seems to be a common practice on several college campuses. People regularly lend software programs to their friends either not realizing it is wrong or not thinking that is a big deal. Softloading/Softlifting is equally common in business and homes. (Moniot, 2004)

**Renting** – Renting involves someone renting out a copy of the software for temporary use without the permission of the copyright holder. The problem arises when someone has rented the software and does not uninstall it after returning the rented copy. For this reason, the unauthorized rented was made illegal in 1990 for the first time in US. Website offering software rentals can be found on the Internet, but this does not seem like a prevalent mode of piracy nowadays. The law permits libraries to lend software provided that the package contains a clear copyright notice, though people may still use the loans for Softlifting type of piracy. (Lancaster, 2001; Godse & Godse, 2007)

**Software counterfeiting** – Counterfeiting means producing fake copies of software, making it look authentic. This is a form of industrial piracy and involves providing the box, CDs, and manuals, all designed to look as much like the original product as possible. Most commonly, a copy of a CD is made and a photocopy of the manual is made. Counterfeit registration cards with unauthorized serial numbers are often included in the packages. Counterfeit software is sold on street corners, and sometimes unknowingly even in retail stores, usually at prices far below the actual retail price. Microsoft has tried to counter this type of piracy by providing a heat sensitive strip at the top of their manuals. When heat is applied, the word ‘genuine’ appears. (Lancaster, 2001; Godse & Godse, 2007)

**Online piracy** – This type of piracy involves downloading unauthorized copies of the software on the internet. This the fastest-growing form of piracy. With the growing number of users online, and with the rapidly increasing connection speeds, the exchange of software on the internet has attracted an extensive following. In the past, bulletin boards were the only places were one could download pirated software. Currently, there are hundreds of thousands of ‘warez’ sites providing unlimited downloads to any user. Often, the software provided through these ‘warez’ sites is cracked to eliminate any copy protection schemes. Internet piracy has extended from software downloads to music and video downloads, especially in the mp3 and avi formats. (Lancaster, 2001; Godse & Godse, 2007) Internet piracy can occur in different ways:

1. Providing access to software by key generators, activation keys, and serial numbers etc. that allow installing the software through downloads. (Godse & Godse, 2007)
2. Linking to or distributing tools that subvert or undermine the copy protections of take-out functions of software. (Godse & Godse, 2007)

**Hard disk loading** – Often committed by hardware dealers, this form of piracy involves loading an unauthorized copy of software onto a computer being sold to the end user. This makes the deal more attractive to the buyer, at virtually no cost to the dealer. The dealer usually does not provide the buyer with manuals or the original CDs of the software. In hard disk loading some unscrupulous suppliers illegally install
software to help sell computers. While many suppliers are authorized to install products onto the machines that they sell, honest vendors usually have agreements with software vendors that clearly state their rights to do so. Hard disk loading is also piracy since it is the unauthorized installation of software onto new or used computers by another person or company, typically to make the purchase of the computer a better deal. Needless to say such counterfeit dealers usually do not provide the buyer with manuals or the original CDs of the software. (Lancaster, 2001; Godse & Godse, 2007)

**License misuse** – Licenses are distributed at discounted rates for high volume customers, academic institutions and for computer manufacturers. However, if such customers redistribute or sell the software to others in violation of the license terms or without proper qualifications, license is said to be misused. (Lancaster, 2001; Godse & Godse, 2007) Following are the ways in which software license can be misused:

1. **Academic product misuse** – Academic licenses are specially manufactured for production and distribution to students and education institutions at reduced process. The special versions of the software are created to meet academic needs. These versions are clearly labeled to avoid confusion with other market segments. Duplication of these specialized versions for distribution to other markets is prohibited. Hence, selling these licenses for usage to non-students and non-educational institutions constitutes misuse of license, and hence piracy. (Godse & Godse, 2007)

2. **Original Equipment Manufacturer (OEM) Bundling** – This type of sales involves selling those software packages on a standalone basis which were specifically meant to be sold with specific accompanying hardware. An example for this type of piracy is providing drivers for a specific printer without authorization. (Godse & Godse, 2007)

3. **Not for Resale (NFR) product misuse** – Some of the products are clearly marked that they are not for relate i.e. NFR. Such products are meant for distribution as sample products or for promotional distribution. These products are not licensed for commercial distribution and use. If they are diverted into commercial channel for distribution, license misuse is said to have occurred. (Godse & Godse, 2007)

4. **Client-server overuse** – This type of piracy occurs when the number of users using a copyrighted software program, in a local area network, exceeds the number allowed by the license. Usually networked licenses have mechanisms to detect the number of licenses being used at one time, but there are ways in which network administrators can override such system checks. (Lancaster, 2001)

As can be seen above, software piracy can occur in various different ways. Software piracy can be conducted in two modes, based on the entity that has done piracy:

**End-user piracy** – This refers to small-scale piracy that is usually done by individuals for their own personal use. Techniques generally used by individuals for this type of piracy are Softlifting, online downloads and license misuse. However, it is quite possible that individuals request shady dealers to perform illegal acts such as hard disk loading in order to install illegal software. End-user piracy is not always deliberate, it can be inadvertent. For instance, if an individual forgets to delete the software that he has installed from a rental disk after the rental period ends. (Moniot, 2004)
Commercial piracy – This is obviously a more serious form of piracy as it occurs on a large scale with the deliberate intent to make profits by harming the sales of legitimate owners and retailers. Victims of commercial piracy can also be consumers who purchase a software package without knowing that they have received a fake copy or without knowing that they are not allowed to have the software package as part of their system purchase. The most common forms of industrial piracy are selling counterfeit software i.e. bootlegging and hard disk loading. Commercial piracy can also be done by independently creating a functional duplicate of an existing program. In addition, industrial piracy may also be done by misusing the license for instance like OEM bundling and sale of NFR products, as discussed above. Bootlegging is a common term used in the context of industrial piracy and refers to the creation of a cracked version of a commercial product. Bootlegging can be done by providing a cracked version of a commercial product and also by developing an illicit duplicate of a legitimately acquired copy. An example was the case of Paperback Software’s VP-Planner, which closely imitated the functionality and user interface of Lotus Development’s popular spreadsheet program 1-2-3. It is obvious that cloning requires a lot of programming effort; however the makers can avoid the prototyping and design efforts involved in the creation of a new program. (Bidgoli, 2006; Moniot, 2004)

4.6 History behind Software Piracy

In general software piracy is said to be applicable to fully commercial software. However, this is always not the case. In addition to free ware i.e. software available for free usage and distribution and proprietary software i.e. the ones requiring license, there is yet another category of software known as shareware. As the name suggests, shareware is the time-limited or function-restricted version of commercial software. The idea is that users can use the software on a trial basis before purchasing a license. Methods of pirating shareware programs include using software key generator, known as ‘keygens’ that generate registrations numbers in order to obtain the right to use the full version and cracking the programs to unlock the full version from the shareware product. Because each of these approaches takes advantage of the software provider’s hard work and generosity, the act is unethical and hence constitutes software piracy. (Honick, 2005)

Software piracy is a global problem and causes enormous losses. Many programs have been created to create awareness among people, but the effect is not encouraging. The issue remains strong as ever, even on putting fines on accused pirated software sellers. Hence, it is important to establish and improve the existing framework of laws and rules on software piracy. In fact, attempting to stamp out software piracy under the current system of intellectual property laws is futile. This is because the drafters of the policy never anticipated a day where infringement would be a common phenomenon done by everyone. Effective protection of software against piracy can be hence be done only by thoroughly investigating the phenomenon of software policy and the factors that influence it. (Dong & Zhang, 2011)

4.6.1 History of Software Piracy

Understanding the history is piracy is extremely relevant in the present scenario as the rampant spread of piracy means that everyone is doing it and that they do not think that it is a wrong thing. Piracy and counterfeiting is not a new concept and has been
widespread since the dawn of artistic expression. Low quality replicas and forgeries have been around for as long as art itself. However, it was extremely difficult to copy art and experts have always been able to distinguish forgeries and replicas from the original. Further, people have well developed knowledge and aversion against possessing a forgery, which means that counterfeit art, is protected against buying as well, unless the seller as a common manages to pass the fake copy as the original. In the modern scenario, it is almost impossible to distinguish a fake software copy from an original one. Further, people are not exactly averse to buying counterfeits, if they manage to get one at a lower price or free of cost. This exact technical and moral shift is the reason behind rampant piracy around the world.

Digital piracy is a new phenomenon and had no existence at all a few decades back. Personal computers first came in the market in 1970s and until the Software Copyright Act was passed in 1980, software was not recognized as intellectual property. Hence, initially there were no laws against theft or reproduction. When Computer Software Copyright Act was originally implemented, software was defined as literary work, thereby making programmers equivalent to modern day literary authors. The first patents were issued to software developers in 1989 in US, giving rise to the notion that all digital media is the intellectual property of the author, who owned the rights to the complied program and the underlying source code. (Honick, 2005)

Honick suggests that the origin of software piracy was extremely innocent in nature. It was started by computer geeks and can be traced as far back in 1980s. At that time computer software was either for extreme hobbyists or large corporations and few geeks had any access to their own computers at home. Local universities held regular computer clubs which served as a point where computer geeks would meet to discuss ideas and share the software they had written, with other club members. These clubs are also now infamous for starting the practice of piracy. As most of the commercial software available at the time was extremely expensive, it was out of the reach for most club members. In fact may times the software packages were much more expensive that the computer itself. This turned the computer clubs to become ‘swap meets’ where members would share applications that they had obtained from other computer clubs. Without piracy, they could have never experimented with technology and never written their own application. Experimentation and the availability of software piracy were actually essential to the success of both computers and software. (Honick, 2005)

The year 1981 is in fact a landmark year in computer crime. The year saw the first arrest for a computer crime and the year when the first widely known viruses were found ‘in the wild’ i.e. in the public domain. There were the Apple I, Apple II, and Apple III viruses, first discovered in 1981. These viruses targeted the Apple II operating system and spread initially in the Texas A&M University systems via pirated computer games. The incident is especially interesting because it involves two crimes. The first was obviously the release of the computer virus. The second was that many of the victims of the virus became victims through their own illegal activity – stealing data via software piracy. Even today, about the only reason people do not actively look for software is because pirated software, illegal music downloads, and illicit web sites are a hot bed for dangerous viruses and spyware. (Easttom, 2010)

By late 1980s bulletin boards were introduced that was entirely digital and allowed its members access regardless of their location by using a phone line and a modem. This meant that club members, indeed any computer geek, could hide their identities and offer software packages for sharing. Piracy became a less innocent act at this stage, as
there were many reasons for offering unauthorized access to existing commercial software packages. Bulletin boards helped in the drastic growth of piracy; in fact they gave birth to the first piracy groups that would be in a race to crack and upload the latest software to their affiliated bulletin boards. Piracy was still in its infancy but was growing as fast as the technology growth rate. The deliberate infringement of laws brought law enforcement agencies in the picture. But as the clubs and discussion boards were a highly technical place, it was not usually possible for law enforcement agents to catch the perpetrators. Most of the cases worked on the basis of anonymous tips, and even when the culprits were caught, it was often a teenager with little or no money. Further, the computer cases were costly to try in court, requiring lawyers specializing in digital copyright infringement and a high technology crime expert. As there was no point in suing if financial retribution was impossible, there were very few court cases. (Honick, 2005) This further led to the impression that even when one breaks the law, the chances of indictment and convictions were very rare, which further spurred the movement of piracy.

By 1990s, the bulletin boards had grown into a menace for legal software sales, as members openly started offering links where people could download the software for free and even provided cracked license and authorization codes. Prior to this software piracy had been categorized by the sale of illegal copies on floppy disks, and more recently on CD-ROMs. The bulletin boards made it possible for software dealers to use internet to offer illegal copies to other dealers or directly to customers. (Gordon, 2005) The practice is rampant even today and shows no active signs of reducing, despite the well-published closure of file-sharing website such as Megaupload and Filesonic. The ease of piracy is not however the only reason for its widespread prevalence. People have a feeling that there is nothing wrong in sharing copies of software with others. The chief reason for this is the free software and open source software movements, discussed in the next section.

4.6.2 Free and open source software movements

Free software and open-source are two influential movements which both have much influence on the development of free and open source software. Although they have some common issues and both the terms are often used interchangeably, their ideologies are entirely different from each other. The movements also practically overlap each other considerably.

Free-software (FS) movement is the predecessor and concentrates on the ethical issues related to user’s freedom when he/she uses the software. Free software movement is based on the arguments developed by Richard M Stallman. Stallman started the FS movement and the GNU project prompted by his experiences of the early hacker culture. The FS movement focuses on the ethical freedom it gives to the users and also pays high attention to the social issues and tries to remedy the unfair in the use of software. The Free Software Foundation is an organization that actively advocates the free software model. It views free software to be equivalent to free speech and views non-free software as a sub-optimal solution and more importantly a social problem. The ‘free’ in the movement refers to the freedom to copy rather than the actual price of software. (Yin, Mu, Liu, & Yin, 2013)

The open source software, in contrast, focuses on strengthening the peer-to-peer development model and hence the technical issues. The developers believe that the
development of software is based on its technical advantages and development model. The idea is to use the open-source strategy to develop the best software for the user. (Yin, Mu, Liu, & Yin, 2013) The idea here is to make the code of the software freely available to user to examine, modify, and redistribute. The open-source software movement started in 1989 with the release of the specification of the World Wide Web specification by Tim Berners-Lee and the team at CERN. The success of the internet is actually the most important factor behind the success of the open-source movement. Open-source software model has also proved to be economically viable as the income generation is still possible by offering support services. Several companies support the movement because it allows them to save money and then pass the savings on to the customer. Open-source software also allows the interest in the product to remain for as long as there is active community to work on it. The release of Linux 1.0 in 1994 by Linus Torvalds officially spurred the open-source movement towards the mainstream. (Huett, Sharp, & Huett, 2010)

The above discussion makes it clear that Free and Open-Source Software (FOSS) refers to the software that is licensed freely to grant the users the right to use, study, modify, and improve its design through the availability of its source code. (Yin, Mu, Liu, & Yin, 2013) In addition to the advantages mentioned above, open source software also allows intellectual gratification and demonstration of an art forms, which means that there is much less interest in doing mischief deliberately. At its start, it merely seemed like a ‘geeky’ revolution, hardly sufficient to challenge proprietary software giants like the Microsoft. Makers of the proprietary software like Microsoft and Apple go to great lengths to restrict access to the source code by creating intricate and complex license agreements. However, the movement has been extraordinarily successful and now run more than half of the world’s servers and has about 20% market share of cell phone operating systems. (Huett, Sharp, & Huett, 2010)

This success further gave impetus to the piracy movement, as many hackers consider it an intellectual challenge to break the license codes of proprietary software packages, which in their view is already an ‘unfair’ model. While the general public is not exactly aware of the incorrectness, it has an idea that a similar software package is available for free, so in their view, if they manage to get access to proprietary software for free, it is not illegal at all.
5 FACTORS INFLUENCING SOFTWARE PIRACY

As has been mentioned earlier, software is extremely easy to steal. One does not need to be a high-tech, high-skilled thief to steal even expensive software packages. This is not even ‘stealing’ in the true sense. Committing software piracy constitutes even the most simplistic action such as copying a software or a movie from a friend/relative/colleague with their knowledge and cooperation. As can be seen, the actions are sometimes so simple and innocent that it might not seem as if one is committing software piracy, but they are clearly acts of piracy. The growth of the importance of software in both personal and professional areas has led to a corresponding increase in the illegal copying of software. Further the battle against piracy is no longer limited to software developers, it has entered the entertainment industry as well on a very large scale. The increasing digital nature of entertainment products like music and movies has meant that people have the option to simply copy the digital copy for free from an acquaintance or download free from a large number of websites. All this has meant that it is more important than ever to understand the factors that influence software piracy, contributing to the very high rates, despite strong measures taken by governments and law enforcement agencies alike. This chapter presents a detailed review of the factors that influence software piracy.

Karakaya and Ulutürk conducted an in-depth research of the previous studies that looked into the factors behind the rampant software piracy. (Karakaya & Ulutürk, 2011) The factors presented in this chapter are taken from their paper detailing their research in the area. Based on this study following are the factors and reasons behind software piracy:

5.1 Public Awareness

A reasonably large proportion of the population is genuinely died to the ignorance of what constitutes software piracy in specific instances. For instance, even today while people are generally aware of the concept of piracy and the fact that they cannot download a movie from a website like Rapidshare, the multitude of legitimate-looking websites selling mp3 music for free creates a doubt in the minds of people as to whether downloading music from such places is illegal or not. There is no sufficient information available on the web regarding the rights of specific music albums. Further, the fact that people can view the videos free on the web creates the false impression that if they can view it free anytime they wish, they can also download it for free. Similar issues arise when people offer their copy of licensed software to their friends. A simple gesture like this generally falls under the category of ‘being helpful’ and it requires a genuine shift in people’s mindset to consider such an action as illegal. A further extremely interesting aspect is the license agreements which the users are expected to agree with before going to the next step of installing the software. Almost no use bothers to read the license agreement, which is anyways in a legalese difficult to understand by anyone but people with a law or intellectual property background. As such, people signing such an agreement without understanding the actual terms they are agreeing to, is a very big part of the reason for the proliferation of software piracy. (Karakaya & Ulutürk, 2011)
5.2 High software prices

As a justification of high piracy rates, some observers point out that people in many countries simply might not be able to afford software prices for the western market. In several Asian counties like China, Vietnam, Thailand etc. where software piracy is rampant, the average annual income is equivalent to about $5300 or even as low as $2000. Expecting users in such countries to legitimately purchase necessary software packages like Microsoft Office for about $250 would mean a major chunk of their annual income, which is an unfair act in itself by software development companies. This cannot be viewed as a universal reason because several countries with high incidence of software piracy have strong economies and respectable per capita income. Analysts further cite the example of India, where there is a fairly large computer-user community, but a very low per capita income of $2700. The country is also the second most populous in the world, but does not figure among the top 20 countries in the world that exhibit the high rates of software piracy. (Parsons & Oja, 2009; Karakaya & Ulutürk, 2011)

5.3 Risk of Penalty

Several studies have found that the perceived consequences, in terms of benefits as well as penalties, are important factors that influence most individuals’ decision to knowingly commit acts of software piracy. In fact, increasing the likelihood of being caught and punished is considered to be an active deterrent to individuals and even commercial efforts to commit software piracy. (Moniot, 2004) However, it must be remembered that piracy is a global phenomenon. As internet has brought the world closer, it has also made it easier for people to hide their geographical location. Further, governmental regulations and penalties related to software piracy is different in different countries. These two factors make it viable for people to consider fudging their location and then commit acts of piracy. However, risk of penalty can still be an effective deterrent because it also makes people actively aware of the fact that the act they are doing is actively illegal and possibly criminal.

5.4 Opportunity

Software piracy is directly related to opportunity. The opportunity in this context is a mixture of skills and resources. Piracy of different software types in different environments requires different skill sets. If the required abilities are beyond an individual’s control, obviously piracy is not likely to occur. In addition, an individual also needs to concern himself with being detected, ease of piracy and other resource requirements. As an example, music piracy is so rampant because it is so easy. One only requires sufficient skill to conduct a basic search operation using search engines. After this, if the user has decent internet speeds, he/she can easily download music, thus taking part in piracy with little or no effort. In contrast, some proprietary software require specialized hardware like dongle, and there is an additional hardware key. While it is possible to break the code, it is not an easy task and is certainly beyond the capabilities of an average individual. This acts as a natural deterrent against piracy of this type of software. The creation of opportunity and the development of skills is also affected to some extent by the ‘extent of benefit’ the user will receive on gaining access
to pirated software. Sometimes if the benefits are not many, the users do not really bother to acquire skills/resources to gain illegal access to the software. This however changes drastically if the user’s perception of benefits acquired increases. At times, users may go to extreme lengths if they feel they have to acquire the software package, but cannot afford to do so. (Karakaya & Ulutürk, 2011)

5.5 Equity Theory

Equity theory is a perceptual theory that assumes that individuals are rational beings and calculate the costs and benefits of an act before choosing a course of action. The underlying impetus of the equity theory is that individuals search for fairness or equity in social exchanges with the desire to maximize one’s own personal outcomes. Social exchanges can include goods and services as well as conditions that affect an individual’s well-being such as psychological and emotional aspects. Reciprocation is a major class of social exchange when there is a direct exchange between two parties. The pirating of copyrighted good most commonly falls under this category. (Piquero, 2011)

The best example is when a software license is shared between two or more friends, neither of which has sufficient money to buy the software application. The friends share a single CD of the software among the group, thus making an equitable exchange. In this case, each of the friends sharing the license has illegally pirated the CD they purchased, each deliberately and consciously anticipating the outcomes will outweigh or be equal to the inputs they bring to the exchange. Piracy and illegal swapping of copyrighted materials is likely to continue as long as the situation and the exchange are perceived by all parties to be fair and equitable. Research has examined the equity theory by focusing on the cost of the product to be copied. In terms of equity theory, individuals were more likely to engage in behavior when they believed the results would come out in their favor. In other words, the higher the cost of the software, the lower is the intention of a subject to allow another to copy it. This has been demonstrated by empirical research. (Piquero, 2011)

5.6 Demographic Variables

Studies show that certain demographic variables influence software piracy like gender, age, individual’s level of study, experience etc. Multiple studies have shown conflicting views on the effect of each demographic factors, though many studies ironically have found that software pirates are generally bright eager motivated and well-qualified. Many studies have also been conducted to determine the individual effect of each demographic factor on software piracy. Some researchers have shown that age does not significantly affect software piracy; however others have shown that younger students are more likely to engage in software piracy as compared to older students. Age has been generally found to have inversely related to the extent to which a person will engage in software piracy. The relationship between gender and piracy is similarly inconclusive. While some studies conclude that gender has no correlation with piracy, others contend that males are more likely to pirate software than females. Researchers had thought that the level of household income was indirectly related to piracy – the higher the household income the lower the piracy levels. However, several studies have debunked this myth, though in several low-income countries it software piracy is
considered to make economic sense, particularly if the software is expensive relative to the average household income. After a while it probably becomes a habitual practice to prefer pirated software as compared to purchasing a legitimate copy regardless of the price. A demographic factor however that is found to closely correlate with software piracy is the academic discipline of the people. Several studies have found that people with majors in Science and Computer studies were more likely to pirate software than people with business major. However, possessing skills does not mean that people would necessarily follow the course as a major, so it is accurate to say that people with an interest in computer science and information technology are more likely to pirate software. (Spark, 2010; Karakaya & Ulutürk, 2011)

Other demographic factors under debate for its correlation with software piracy are computer ownership and experience with computers. Researchers have long debated whether owning computers and experience in working with computers makes people more or less inclined to use pirated software. Evidence points both ways, making the issue extremely debatable. Demographic factors are not the most reliable indicators of the type of people who would commit computer piracy. In-depth studies have found conflicting evidence, showing that there is no specific ‘type’ of people who commit piracy. (Spark, 2010; Karakaya & Ulutürk, 2011)

5.7 Previous Behavior

The ease with which software application, music and videos can be downloaded or procured for free has resulted in a large number of computer users simply fall into a habit of casual piracy. This type of habitual software piracy doers are not deliberately criminal in their intent, they simply are used to the concept of getting the software applications for free and probably even consider it a challenge to find places where they can download software for free. This category of software piracy has interested researchers and software developers alike. Common intelligence suggests that people who have enacted software piracy in the past are more likely to commit such actions in the future as well. Researchers consider that there is a level of moral disengagement mechanism that activates once someone has conducted acts of software piracy. However, simply an activation of this mechanism is not a sufficient incentive for acts of piracy to be conducted in future. Researchers have found that further moral disengagement many be necessary in order for individuals who have pirated software in the past to engage in similar behavior in the future. Of course repeated acts of piracy serves to increase the level of moral disengagement, thus making users feel less guilty about their actions. However, other factors such as opportunity, behavior of peers, general moral considerations of the society, and harshness of punishment are all necessary drivers that effect moral disengagement. (Garbharran & Thatcher, 2011)

5.8 Author’s Remoteness

A very interesting factor researched as a possible cause of piracy is the remote nature of the content owner. As software itself is an intangible thing, people are less inclined to consider its unauthorized usage as illegal. This is exacerbated because of its apparent free availability on the internet. People feel that if it is ‘lying there’ for free, they might as well use it. If the owner does not have a problem if his/her content exists for free on a webpage, he/she may not be bothered if someone downloads and uses it. The push
comes to shove because of the fact that the owner is not physically known to the computer users. The information of the owner is yet another webpage that people can easily ‘skip’ to read, hence abdicating all feeling of moral guilt. If they do not know the owner, they can steal his/her work that already exists for free on the web, without harming anyone. (Karakaya & Ulutürk, 2011)

5.9 Moral and social factors

One of the main difficulties in countering software piracy is because it is a moral minefield. There have been several studies conducted by researchers to understand whether software piracy is a crime at all. Constant rhetoric by the free-software and open-software groups don’t help the situation. Standard theories of moral behavior have been applied to test this apparent confusion about the morality of software piracy. Studies on software piracy, in this context, have generally taken a normative approach. This approach concerns with ethical decision making from an ethical perspective. Normative approaches are essential for developing standards of behavior in a particular domain. The approaches are usually theoretical as opposed to empirical. The goal is to expound on what is the expected behavior from people i.e. what people should and should not do, rather than what they actually do in real life. Normative studies into software piracy comprise of the deontological and the teleological approach. (Zamoon, 2006; Jeurissen & van de Ven, Values and Moral Norms in Organization, 2007)

From a deontological perspective, this involves understanding whether moral rules concerning ownership and property apply to software at all. That is to say a deontological approach judges the act of piracy based on the generally held beliefs of right and wrong. Thus questions from this perspective help to understand whether software piracy is a theft or not. Further, studies from a deontological perspective also try to answer whether it is morally right to levy some type of tax on information carriers in order to compensate software producers for loss of income, even though this may inadvertently affect innocent people. Teleological approach judges the actions based on its consequences and hence this approach is also known as consequential. Using a consequentialist approach, researchers attempt to understand whether software producers do not benefit as well from illegal copying, since this enhances their brand recognition. The idea is to understand the exact amount of losses that software developers face as a result of software piracy. Given the innovative history of software development and the role of computer clubs, discussed earlier, it is important understand whether illegal copying is detrimental to innovation since R&D costs cannot be recovered, or it ends up making more robust security measures. Finally, consequentialist approach also attempts to understand whether the costs of prosecuting piracy offenders cancel out the benefits such as acting like deterrents to possible future offenders. Teleological approaches can be segmented into utilitarianism and egoism. Utilitarianism looks into maximizing the benefit for a maximum number of people, while egoism maximizes benefits for a single individual. (Zamoon, 2006; Jeurissen & van de Ven, Values and Moral Norms in Organization, 2007)

In addition to normative approach, psychological approaches have also been studied to understand the issue of the development of moral reasoning behind an individual’s involvement in software piracy. This research approach is based on the theory given by psychologist Lawrence Kohlberg in 1969. According to Kohlberg, social development is cognitively based and cognitive development is linked to moral socialization. Kohlberg
developed ten hypothetical moral dilemmas and based on free responses to these dilemmas divided and labelled moral judgment into three phases of moral development, with two stages in each phase. These stages are characterized by the rationality principles employed during each stage and phase. (Zamoon, 2006; Williams, 2008)

At the pre-conventional level of moral development, people decide based on selfish reasons. An individual at this stage simply tries to avoid punishment in Stage 1 and advances to the Stage 2 by desiring rewards for his good behavior. In the present context, an individual at Stage 1 would not copy the software only because he/she is afraid of being caught and punishment – the only deterrents. At the Stage 2, also known as the instrumental exchange stage, the individual is less worried about punishment and more about doing the things that directly advance his needs, and hence the desire to copy the software. (Zamoon, 2006; Williams, 2008)

At the conventional level of moral development, in State 3 an individual anticipates disapproval of others and in Stage 4, moral development shifts to maintaining existing order. Thus, people at this level make decisions to conform to societal expectations. In other words, they look outside themselves to others for guidance on ethical issues. As an example, at Stage 3 people would illegally copy software, if others are going i.e. if it is a common societal behavior. If it is not a common societal behavior, such people will not copy software. At Stage 4, also known as the Law and Order Stage, people would do whatever is permitted by law. If there is a clear law stating that it is illegal to copy software, they would not do so. (Zamoon, 2006; Williams, 2008)

At the post-conventional level of moral development, people use internalized ethical principles to solve ethical dilemmas. In State 5, an individual abides by the law, while at the Stage 6 moral development shifts to the application of universal principles akin to those advocated in normative theories, discussed earlier. Thus, people in Stage 5, would refuse to copy the software because they feel that society is better off when the rights of others, in this case software developers and owners, are not violated. At Stage 6, the universal Principles State, people will not copy the software depending on their individual principles of right and wrong. Further, people are more likely to stick to their principles, even when that principle conflicts with the existing law or what others believe is best for the society. This does not necessarily mean that people belonging to this stage would not indulge in software piracy; just that they will make the decision based on what they consider is right or wrong. For instance, people with communist beliefs would probably choose to copy the software because they believe that goods and services should be owned by the society rather than by individuals and corporations. (Zamoon, 2006; Williams, 2008)

Kohlberg believed that as people became more educated and mature, they progress sequentially towards later stages of moral development; though only about 20 percent ever reach to the post-conventional level’s sixth stage. This automatically means that people in locations such as workplace and universities look to and require leadership when it comes to ethical decision making. In this context, research has shown that most undergraduate students believe that copying original software is socially and ethically acceptable, and that business executives are less likely to hold such beliefs. However, multiple empirical researches attempting to tie software piracy with ethical and moral concerns have not found conclusive evidence definitely linking piracy and level of moral development, suggesting that this factor on its own cannot be held responsible for people pirating software. (Zamoon, 2006; Williams, 2008)
5.10 Cross national perceptions of intellectual property

Statistics of software piracy differ by world region. Fig 1 shows the PC software piracy rates by region in 2010 and 2009. Fig 2 shows the largest economies in terms of the commercial value of pirated PC software in 2011 and the piracy rates in these countries.

**Figure 1.** PC Software Piracy Rates by Region (Business Software Alliance, 2010)

<table>
<thead>
<tr>
<th>Region</th>
<th>2010</th>
<th>2009</th>
</tr>
</thead>
<tbody>
<tr>
<td>Central &amp; Eastern Europe</td>
<td>84%</td>
<td>84%</td>
</tr>
<tr>
<td>Latin America</td>
<td>80%</td>
<td>83%</td>
</tr>
<tr>
<td>Asia Pacific</td>
<td>60%</td>
<td>63%</td>
</tr>
<tr>
<td>Middle East &amp; Africa</td>
<td>68%</td>
<td>58%</td>
</tr>
<tr>
<td>Worldwide</td>
<td>48%</td>
<td>43%</td>
</tr>
<tr>
<td>European Union</td>
<td>35%</td>
<td>33%</td>
</tr>
<tr>
<td>Western Europe</td>
<td>33%</td>
<td>34%</td>
</tr>
<tr>
<td>North America</td>
<td>21%</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Country</th>
<th>Pirated Value ($M)</th>
<th>Legal Sales ($M)</th>
<th>Piracy Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>US</td>
<td>$9,773</td>
<td>$41,664</td>
<td>19%</td>
</tr>
<tr>
<td>China</td>
<td>$8,902</td>
<td>$2,659</td>
<td>77%</td>
</tr>
<tr>
<td>Russia</td>
<td>$3,227</td>
<td>$1,895</td>
<td>63%</td>
</tr>
<tr>
<td>India</td>
<td>$2,930</td>
<td>$1,721</td>
<td>63%</td>
</tr>
<tr>
<td>Brazil</td>
<td>$2,648</td>
<td>$2,526</td>
<td>53%</td>
</tr>
<tr>
<td>France</td>
<td>$2,754</td>
<td>$4,689</td>
<td>37%</td>
</tr>
<tr>
<td>Germany</td>
<td>$2,265</td>
<td>$6,447</td>
<td>26%</td>
</tr>
<tr>
<td>Italy</td>
<td>$1,945</td>
<td>$2,107</td>
<td>48%</td>
</tr>
<tr>
<td>UK</td>
<td>$1,943</td>
<td>$5,530</td>
<td>26%</td>
</tr>
<tr>
<td>Japan</td>
<td>$1,875</td>
<td>$7,054</td>
<td>21%</td>
</tr>
<tr>
<td>Indonesia</td>
<td>$1,467</td>
<td>$239</td>
<td>86%</td>
</tr>
<tr>
<td>Mexico</td>
<td>$1,249</td>
<td>$942</td>
<td>57%</td>
</tr>
<tr>
<td>Spain</td>
<td>$1,216</td>
<td>$1,548</td>
<td>44%</td>
</tr>
<tr>
<td>Canada</td>
<td>$1,141</td>
<td>$3,085</td>
<td>27%</td>
</tr>
<tr>
<td>Thailand</td>
<td>$852</td>
<td>$331</td>
<td>72%</td>
</tr>
<tr>
<td>South Korea</td>
<td>$815</td>
<td>$1,223</td>
<td>40%</td>
</tr>
<tr>
<td>Australia</td>
<td>$763</td>
<td>$2,554</td>
<td>23%</td>
</tr>
<tr>
<td>Venezuela</td>
<td>$668</td>
<td>$91</td>
<td>88%</td>
</tr>
<tr>
<td>Malaysia</td>
<td>$657</td>
<td>$538</td>
<td>55%</td>
</tr>
<tr>
<td>Argentina</td>
<td>$657</td>
<td>$295</td>
<td>69%</td>
</tr>
</tbody>
</table>

**Figure 2.** Economies ranked in terms of commercial value of pirated software in 2011 (Business Software Alliance, 2011)
As can be seen from Fig 1 and Fig 2, software piracy rates differ immensely from region to region. US and hence North America have lowest piracy rates. Ironically, even with this low piracy rates, the country still lead in terms of the pirated value of software. This might be only a small percentage of the actual sales but still in terms of dollar value, the pirated software value is extremely high. China is extremely interesting in this regard. First, it is the second highest country in terms of the dollar value of pirated software. More importantly, the dollar value of pirated software sales, leads the legal software sales by more than three times. The case is similar in Russia, India, Brazil, Indonesia, Mexico, Thailand, Venezuela, Malaysia, and Argentina. However, even the combined value of pirated software does not exceed the pirated software sales in China. Venezuela and Indonesia have the highest percentage of pirated software, followed not surprisingly by China. Further, the pirated software sales by region show that Western Europe, European Union and North America have the lowest software piracy rates. Rest of the regions of the world has more than 60% piracy rates.

These glaring regional differences have prompted several researchers to investigate the attitude towards software piracy and intellectual property perceptions in different countries and cultures. There is clear evidence with regards to the differences in perceptions in different countries. Not surprisingly, the attitude in US is to protect original creative work. Sometimes the effort to protect IP right goes to the extent of monopolizing knowledge. In contrast, Asian countries, even developed and advanced ones like Singapore, consider it an obligation to share the developments with society as a whole. (Zamoon, 2006)

Software piracy is seen to be much higher in regions where legal protection for software does not exist or is very feeble, like in African nations, as well as in regions where such laws exist but are rarely enforced, like in Asian countries. In Western countries, in fact the western world as a whole, it is commonly accepted that the creator of intellectual property is granted rights to exploit the property for financial gain. Thus the notion of intellectual property and hence laws related to them are extremely similar in Western Europe as well as North America. Creators of intellectual property in these countries are rewarded and recognized for creating unique works and often criticized for copying other’s works. It is a common practice in the western world to encourage and reward individualism. Such a cultural background makes it easy to claim software piracy as being unethical. This attitude, more than anything, explain the very low rates of piracy in these countries. The high dollar value of pirated software in US can be attributed to allegations of industrial piracy, which is rampant in US, as well as constant commercial legal battles to protect intellectual property in US between rival companies. (El-Sheikh, Rashed, & Peace, 2005; Zamoon, 2006)

In contrast, in several other cultural traditions, most notably in Asia, the concept of individual ownership of intellectual property is not very common. Hence, in these countries the concept of copying does not have a similar shocking response, as it is considered acceptable to copy the work of masters and use previous work to get success. Another reason is the focus of collective effort, rather than individual benefit in these countries. Asian countries put a lot of stock in people striving to become part of the whole and individualism is sacrificed for the benefit of the group. In this type of culture, it is easy to see how the concept of individual ownership of a virtual property like software program, which can be copied and distributed at no cost to the author, can be difficult to establish. The perception of intellectual property is entirely different in these countries than the western culture. It would hence be extremely difficult to explain the concept of software piracy to people belonging to such cultures, as it is not seen as
an unethical activity at all, merely a community activity. This is exemplified in the high rates of piracy in these regions as seen in Fig 1 and Fig 2. In fact evidence has shown that Asian countries have been reluctant to grant Western-style copyright protection to software, and even where such protection is provided by law, it must compete in the moral sphere with strongly held traditional values of community and solidarity. For instance, acts such as not sharing a software license between friends and family members is actually a much serious moral and ethical issue than actually going against law and sharing the license. Even when such an action is brought in a court of law, areas such as common-law, family law conflict with the western-style of copyright laws as friends and family members are expected to protect each other’s interests. (El-Sheikh, Rashed, & Peace, 2005)

As the global marketplace has become a reality, and western business concepts are embraced across the international spectrum, it seems inevitable that the Western concepts of intellectual property will have to be accepted by other cultures and their corresponding legal systems. However, it may be a slow process and will require well-developed educational programs. Western cultures should temper their impatience with the unethical nature of software copying in Asian societies and understand the cultural traditions in which their ethics were developed. (El-Sheikh, Rashed, & Peace, 2005) A very interesting concept in this context is present by Brooks and Dunn. According to them being a rigid cultural relativist as bad as being an ethical imperialist. Cultural relativism, in their view, is morally blind. There are fundamental values that cross cultures and hence multinational and even intra-national firms should uphold. However, ethical imperialism, which is at the other end of the spectrum, is equally inadequate in their view. This type of culture directs people to do everywhere exactly as they do in their home country. This might be good in some of the issues, but not all. Some of the issues such as collectivism and conservatism are deeply entrenched in certain cultures, and arguing against them is not only futile, but is also domineering, because it is just an alternative way to behave – different, but not necessarily wrong. Ethical imperialism leads to absolutism, which is a dogmatic way to behave and goes against the basic principle of a global civilized society, respect for different cultural traditions. (Brooks & Dunn, 2011) Hence, getting the world to agree with and adhere to a common set of software piracy principles is difficult. Too many cultural beliefs are challenged and western-style principles may not be the eventual right answer either.

5.11 Conclusion

Software is one of the most important technologies of the Information Age, running everything from PCs to the Internet and is also a core part of the modern entertainment industry. However, illegal copying and distribution i.e. software piracy persists globally, causing losses of millions of dollars. Hence, researchers have actively investigated the possible causes of software piracy from a multitude of different perspectives. This chapter has presented an exhaustive summary of the possible factors responsible for rampant software piracy. The review shows that none of the factors can be held in isolation as the contributing factor or even the most important factor. However, there are definite regional differences in the different cultural perspectives of intellectual property rights which are closely related to the software piracy rate distribution in the world. The next chapter will take these factors into consideration to review possible measures that taken are undertaken create awareness in order to reduce the levels of software piracy rates throughout the world.
6 MEASURES TO CREATE AWARENESS TO REDUCE SOFTWARE PIRACY

The tremendous damage caused by software piracy especially due to the explosive growth of internet piracy has forced governments to enact global legislative actions. The World Intellectual Property Organization (WIPO) has concluded two copyright treaties WIPO Performances and Phonogram Treaty (WPPT) and WIPO Copyright Treaty (WCT) that constitute the WIPO Internet Treaties. The idea is to increase the global minimum standards of intellectual property protection. An increasing number of countries have implemented the WIPO Internet Treaties and already taken steps to improve their laws. (Arslan, 2006)

However, effectively reducing digital piracy requires a fundamental shift in the public’s attitude towards this practice, and public education is a critical component of any successful effort. Increasing public awareness would act as an inhibitor to software piracy. Public awareness campaigns are extremely important as they build social awareness of software piracy. The lack of awareness of the different aspects of software piracy has several negative consequences and has been identified as one of the key driving motives of copyrights infringements of all types. Public awareness campaigns should also be focused on long terms goals instead of short term ones, as social change is a gradual thing that happens over a period of time, not instantaneously. (Piotr & Danny, 2009)

6.1 James Rest’s four component model

Generating public awareness is not a single task as people need to be aware of software piracy issues from different perspectives. As seen from the previous chapter, there is a wide array of motives behind that prompts people to commit acts of piracy. As none of the factors is singularly responsible, awareness campaigns must address attitudes towards software piracy in general at several different levels. In this dissertation we propose using James Rest’s Four Component Model. This is a direct extension to the Kohlberg’s three phase moral development discussed in the previous chapter. Kohlberg’s approach was essentially a normative theory that described the moral reasoning behind people committing piracy. The theory however is abstract and cannot be used as a blueprint to improve develops the morals of people, so that they advance from one stage to the other. James Rest, a student of Kohlberg, adapted his model of develop a model of moral judgment. His specific criticism of the model was that individual reasoning cannot occur stage-wise and individual experiences and particular dilemmas faced by the individual may prompt him/her to shift between stages. Further Kohlberg’s model concentrated only on moral reasoning, which Rest argued is not sufficient motivation for people to behave morally. Rest’s four component model is based on the notion that four psychological processes need to occur for individual to behave morally. The four distinct components required for moral behavior are: Component I – moral sensitivity, Component II – moral judgments, Component III – moral motivation, and Component IV – moral character. (Goodwin, 2007) A brief discussion of the components is presented below along with the awareness components that would inculcate these processes within individuals.
6.1.1 Moral Sensitivity

This is the first component of Rest’s model. The key element here is for an individual to first understand that a situation may have more than one course of action. Following this an individual must be able to understand the possible impact of each course of action on the parties involved. Based on this analysis, an individual is able to understand the multiple courses of actions and that fact that he/she has to consider impact on others before deciding. Awareness campaigns conducted should concentrate on training the sensory systems to interpret a given situation in terms of possible actions, consequences, and impact on all stakeholders. This might seem a very basic human skill, but multiple researches conducted in the area has indicated that most people find it challenging to identify even relatively simple situations. Also as Rest suggests, the ability to infer the impact of actions on others is a development process that increases with age and experience. Further, sensitivity is not an absolute concept and is relative in nature. For instance, people might be more sensitive to the impact on a certain section of stakeholders, and absolutely unaware of the impact on others. (Goodwin, 2007; Ray, 2007)

In many cases, especially software piracy people may not even be aware of all the parties affected by their actions. As is seen in the previous chapter author remoteness adds to the ease of piracy, as people do not think that their actions are affecting real people, who might suffer as a result of their actions. This is especially true in case of digital piracy in the entertainment industry. People are aware of highly visible parties such as famous ‘pop-stars’, ‘film-stars’ and possibly even ‘directors’ and ‘production companies’. Everyone is aware of that such people earn millions of dollars and there is a general feeling that if someone downloads a few songs, it would not be a big loss. However, the entertainment industry has several direct and indirect dependents that are also affected by the piracy, and most of them are not rich. Even in countries where piracy does not have strong legal implications, people must be made aware of the various parties that would suffer as a result of digital piracy. The case is the same with software downloads, people are not aware of the stakeholders involved in the software industry, as they have no ‘physical’ presence. But a lack of such presence does not mean that no one suffers when people illegally download software applications. Awareness campaigns must begin with making the stakeholders clear in the mind of people, so that they have sufficient information before they decide to deliberately get involved in acts of piracy.

6.1.2 Moral Judgment

This is the second component of Rest’s model. The key element here is for an individual to actually decide which course of action is right, just or fair. After deciding the morally right course of action, the individual must commit to an action. Moral judgment is the only component included in Kohlberg’s original theory of moral development. Once a person has understood the multiple courses of actions, each must be evaluated to determine which one is the most justifiable from an ethical standpoint. In other words, an individual makes a conscious decision of what has to be done when presented with such a situation. This type of action is based upon an intuition of fairness, even in the earliest stages of life, and even in the most complex of situations. The resulting moral ideal is determined in large part upon the shared cultural norms as well as individual moral values and is also based on virtues such as duty, justice, fairness, and
Ethical decision-making is an area that not only has baffled individuals but also large corporations. The concepts of industrial espionage, corporate governance, environmental responsibility etc. are the well-known areas in corporate affairs that actively involve the concept of ethical decision-making. (Goodwin, 2007; Ray, 2007)

In the area of software piracy, the simplest situation of moral judgment arises when an individual starts looking for a particular software application. Modern search applications make it easier to find results closer to the intentions of the computer user. When a user is actively searching for the particular software application in ‘warez’ type websites, he/she has deliberately chosen a path that is morally questionable. The way an individual chooses this path describes his/her moral judgment. It is often stated that smart people are more apt to make morally right decisions. This might be true, but it doesn’t automatically mean that a person will choose to ‘buy’ a software application, rather than download it for free, ‘borrow’ a copy from an acquaintance, use a freeware or open source version, or rent it from a public library or database. The existing social practices within the culture and an individual’s own understanding of justice and fairness makes him/her decide on the path that he/she feels is the most moral. Awareness campaign aiming to address this aspect of moral decision making process starts at a very early stage in the society, when parents explain their children about the concepts of right and wrong. Needless to say, this varies from culture to culture and is responsible for the actual differences in attitudes towards intellectual property rights in different culture. There are certain actions, however, that are definitely in the wrong and illegal, not to mention unethical. For instance, using a ‘warez’ website to download any type of software is an illegal activity, as it directly amounts to deliberate stealing with an intention of not paying for the usage. Clearly stating the illegal activity goes a long way to make people understand the rights and wrongs. This means that people cannot plead ignorance when they are caught doing obviously illegal actions.

6.1.3 Moral Motivation

This is the third component of Rest’s model and involves the commitment an individual makes towards the moral course of action. The process occurs when an individual places greater priority or emphasis on moral values over other values that may conflict with the moral value. As can be seen, this involves an individual to select among competing values by placing a priority upon the values that are considered the most moral, and thus emphasizing over personal desires. It is often found that a person may be aware of the moral issues of a particular course of action, but he/she still follows that course based on external pressures that are non-moral such as family obligations, social expectations etc. Not only does following a moral course of action involve a commitment to determined moral values and behavior, it also involves taking responsibility for the ensuring results. In other words, even when an individual is capable of identifying the right course of action, there is no certainty that they will be able to muster enough moral courage to behave ethically. Doing the right thing may involve personal sacrifice or potential hardship and not everyone is prepared suspend their personal interests in order to help others. Moral action is more likely when personal interests are compatible with the moral action required. (Goodwin, 2007; Ray, 2007)

Researchers have always shown active interest in understanding what exactly motivates a person to act morally despite adverse external influences. Some of them have asserted that altruism is an inherited quality causing individuals to behave morally, while others
believe that social modeling is responsible for the behavior of an individual. Still others state that moral action results from an association with something greater than self, such as a country or a cause, while a determined body of researchers contend that empathy is the basis for moral action. Despite the disparate reasoning behind moral behavior it is clear that knowledge of moral course of action does not always guarantee that an individual will necessary follow that path. (Henning & Walker, 2003; Bradley, 2009)

Two types of software piracy scenarios justify this process. First, if a person wishes to get the current chartbuster’s mp3 version. It is almost too easy to get this for free and most people in the individual’s organization (workplace or university) opt for downloading free versions from the internet. It is even considered a challenge to find free version of the music. In this case, even when an individual is aware of the right course of action i.e. legitimately purchase the song, he/she may not be inclined to do so. It does not matter whether the cost is low; it is just to be a part of the social group. The second example is more serious and involves Softlifting i.e. sharing a copy of licensed software with a friend who does not have the license to use it. The right course of action is to say no to the friend/family member/colleague and urge them to purchase a copy of the software application legitimately. In Asian countries, such an action is almost unheard of, especially if the situation involves close family members. Further, as family members are considered to be a part of the same group, it is somehow assumed that a single license will be shared, even when the license agreement clearly states otherwise. An individual in this scenario is more likely to bend to the familial expectations than follow the ethical course of action otherwise he/she will be at the receiving end of disapproval and possibly even persecution.

Creating awareness of moral actions in this scenario is not an easy task. In fact only creating awareness is not sufficient either. The concept of software license and intellectual property rights must be embedded within the culture right from the beginning. In addition, some type of deterrence also works. For instance, the campaign in this case could focus on the problems associated with non-licensed software. This includes highlighting the fact that only licensed software can legitimately get support. Also most of the software applications nowadays come with internet authorization codes. As soon as internet is connected, it is possible to discover if more than one legitimate copy is installed. Making people aware of technical advancements in detection, combined with the possible civil and criminal actions that can be taken against them, if caught, is also a useful part of the campaign. Finally, people must also be made to understand the jurisdiction issues. Most of the people feel that they can remotely indulge in acts of software piracy, if the company developers are in a different nation than the user. Modern day jurisdictions have uniform IP protection rights in all countries who have signed the WTO agreement. Hence, people in these countries should be made aware of the fact that they can be held for prosecution, if their country is a signatory of the WTO law. Deterrents such as this would help in overcoming issues due to familial solidarity, as in this case the individual has to think about the legal repercussions to even the people he/she is trying to help.

6.1.4 Moral Action/Character

This is the fourth and final component of Rest’s model and entails having the courage and integrity to act upon the determined moral action. This process involves implementation of the desired behavior and encompasses personality attributes as well
as cognitive processes necessary to implement the moral choice. An individual deciding to continue on the path of his/her chosen moral action requires strong character traits like self-regulation, persistence, and courage. This component is considered to be the most difficult to define among all the four components because it is a mixture of personality characteristics and behaviors. Of all the components in the model, this is also the least developed because of its overlap with the other components. For instance, moral character cannot be considered to be separate from moral motivation and is based on the assumption that an individual possesses moral sensitivity and sound moral judgment. The simplest way to explain the difference between moral motivation and moral character is that moral character develops over a period of time based on past actions. An individual, who has long charted an ethical path would habitually choose the correct path based on his previous experiences and inclinations. Moral character also is the only factor that actively influences the behavior of other people in the society and acts as a deterrent as well. (Goodwin, 2007; Ray, 2007)

In the context of software piracy, an example is that of a professor or supervisor who does not like to purchase software applications illegitimately. Such a person is bound to influence students and employees under him, respectively to follow similar actions. While this may not necessarily reduce the piracy in its entirety in the organization, it definitely acts as a deterrent to people around him. For instance, if the software application or music mp3 is reasonably priced, people might be more inclined to purchase the software legitimately rather than going to the bother of illegitimate purchase and hiding the fact actively from their professor/supervisor. The obvious targets of awareness campaign are hence influential people like college professors/lecturers/instructors and line managers and supervisors who are directly in contact with people they manage on a regular basis. When such people are convinced that piracy is an unethical act, it would be easy to see a waterfall effect in the immediate environs.

6.2 Effective awareness using the four component model-summary

As discussed earlier, James Rest theorized that all four components are essential in order for an individual to behave morally. When faces with an ethical dilemma most people undergo an internal moral deliberation process, which may be conscious or subconscious. The ethical dilemma answers the questions of selecting the right path in face of other’s distress. Further, it has also been mentioned that the morally or ethically ‘right’ path means different in different cultures. In a situation where family members are urging an individual to commit an act of software piracy, people in the western culture tend to go as per their own council of what is right and wrong. They may even charge their family, friends and colleagues, of putting undue and unwarranted influence into committing ‘wrongful’ acts. However, when the same situation occurs in Asia, the definition of moral action entirely changes. An individual goes through the same deliberation process; however ethical action in this case is to support family members, even if an individual has to commit illegal acts. It can be seen that the ethical conditioning is different across different cultures. Hence, instead of taking the part of one culture over the other, the campaign as a whole should take WTO acts as baseline to generate public awareness.
7. DISCUSSION AND CONCLUSION

7.1 Discussion – Motives behind software piracy

Hong rightly points out that motives are the basic causes and determinants of all behaviors which are not haphazard, trivial or purely habitual. In addition, he astutely asserts that motives can be psychologically, economically, institutionally, and technologically based. (Hong, 2011) The discussion in this dissertation centers on assessing the motives behind software piracy and digital counterfeiting – creating unauthorized duplicates of original software and selling them or using them as authentic items. Software piracy and digital counterfeiting affect more than just big businesses and governments. Because software pirates cost software developers a great deal of money, these companies have to charge higher price and have less money available for research and development, which directly affects law abiding consumers. Hence, there has been a lot of interest in understanding and analyzing the motivations behind software piracy.

The discussion shows that there can be a wide variety of motivations behind a person intending to commit acts of software piracy. Discussing from Hong’s perspective, as above, a person may be psychologically motivated to pirate software as a means to gain social acceptance. Psychological motivations behind software piracy also include affirmation of personal status by considering the act to be a challenge or even to satisfy curiosity – a common refrain of hackers. Economic motivations for software piracy arise in countries with low per capita income. It has often been stated that all other things being the same, both individuals and firms in wealthier nations are better able to afford legal software and thus the piracy of software relatively less attractive. As there is no way to realistically differentiate economic factors from other motives, there has been no confirmatory proof to this theory. In addition to the cost of software, economic motivations also include the opportunity cost of being detected and punished for their actions. Developing countries, where rules related to software piracy are in the process of being formulated as well as where the rules are much more lax, have much higher instances of software piracy than developed countries with tough legal measures. Institutional factors refer to the political freedom and a state of low corruption. Needless to say, countries that enjoy political freedom have less rates of software piracy than the emerging nations, where politics are still enmeshed in non-transparent hereditary principles. Finally, technological capabilities are directly related to the rampant nature of software piracy and digital counterfeiting. It is extremely easy to create a duplicate copy of the software, which is in no way different or inferior to the original. In fact once duplicated, it is almost impossible to distinguish the original and the counterfeit copy. Further, modern technology ensures that the process of duplication is extremely simple, and does not require specialized capabilities. (Hong, 2011) This ease of software counterfeiting is one of the chief reasons for unauthorized duplication of software – it is so easy to do that it hardly seems illegal, but it is!

7.2 Contributions of the study and limitations

The present dissertation has covered the philosophy of computer ethics and the various theories and attempted to understand the motivations behind computer piracy. With this
knowledge, we found that one of the effective ways of controlling software piracy is to enhance awareness among general public about what constitutes software piracy and highlighting the losses to various innocent parties. However, prevention is not always the best form of cure, especially when the problem is as widespread as software piracy. Some of the problems are obviously because of the lack of appropriate laws and regulation mechanisms. As software is not location bound, appropriate laws need to be amended to ensure ownership rights on a global scale. Many of the people simply escape because there are no laws and regulations in their own country to halt their activities. A series of measures can be undertaken to ensure this situation, which will dramatically reduce the ease of piracy. These and related issues are not covered in the present dissertation as the discussion here is limited to the theories of computer ethics as they apply to software piracy and bringing transformation by changing the perception of people towards stealing software or using software without appropriate licenses.

7.3 Conclusion – Create effective awareness about software piracy

The above summarization of the factors motivating individuals to engage in software piracy activities show that the act itself is so easy to do and hence so difficult to trace that any form of strict legal deterrents are never going to work effectively on their own. Even in countries with strict legislative measures, software piracy accounts for one fifth of all the software owned by consumers, which is an extremely high rate when one realizes that software piracy is actually theft. Technical deterrents work, but they do not offer a complete solution either. This is because implementing such measures increases the cost of software, which may not be an economically viable solution for low and medium cost software. Hence the only active way to stop software piracy is to appeal to people ethical and moral values – the hallmark of a civilized society. Needless to say, such measures will not work on their own and have to be backed by both legal and technical deterrents, but focusing on people psychological motivations to commit acts of software piracy is an important aspect.

The present research approached this problem by applying the universally accepted Kohlberg’s moral development stages, to understand the way in which moral development occurs in people. According to this theory, moral development is an incremental process and people sequentially advance from Stage 1, where the only reason to not indulge in piracy is the fear of being caught, to Stage 6, where people use their internally developed ethical reasoning, based on past experiences to choose moral path. This is a comprehensive theory, but suffers from the two flaws. First, the progress from Stage 1 to Stage 6 is considered linearly progressive, which is not the case in real life. People may advance or regress based on their current actions. Second, moral judgment is considered to be the only process factor that advances people from one stage to another. This again is not true as people have multiple influences that prompt them to act morally. James Rest, a student of Kohlberg, adapted this model to develop a four component model, according to which there are four processes that need to act together to make a person act morally – moral sensitivity, moral judgment, moral motivation, and moral action. An individual must develop a sense of different courses of actions that can be taken in a particular scenario as well as the consequences of these actions on other and use his judgment to evaluate the moral course of action. Following this, the individual is motivated to commit himself to act on the path he considers is morally right, and finally has the strength of character to actually act in a moral way. As can be seen, all four processes are required to make people act in a morally right
It is important that people are aware of the right and wrong, and creating awareness is extremely important. In order to develop moral sensitivity, people have to be made aware of all the parties that are affected by software piracy and how each group would suffer as a result of the act. People also need to understand their legal and social obligations and must be made to understand that software piracy is theft and a criminal act, similar to shoplifting in supermarkets, even when it is easy to do. In addition, people have to be made aware of the terms and conditions of license agreement. Most people have a misconception that if they have purchased a software CD, they ‘own’ the software and have full rights of software ownership that allows them to install the software on multiple computers and lend it to their friends and family members. License agreement for individual license does not give them this right. Customers must be made aware when they purchase a software CD with an individual license, they are purchasing a permit that allows them to install and use the software on one system at a time only. It is similar to purchasing a gramophone record. Buying the record does not allow the buyer to copy it and give it to their friends. The record can of course be loaned to friends, but only one user can play the record at a time, and when the record is returned back to the owner, the friend does not get the right to play an unauthorized copy of the record, even if it is physically possible to create a duplicate copy with less effort.

Software companies are increasingly using education as a tool to counter software piracy. By educating business and consumers about the legal use of software and the possible negative consequences associated with antipiracy laws, the industry hopes to reduce the known use of illegal software significantly. Some software manufacturers have also launched extensive public relations campaign to create awareness among their customers. These measures include including information on their Websites, in product information brochures, and in advertisements, explaining consumers on how different types of antipiracy precautions work and why are they needed. Educational awareness programs and consumer awareness campaigns would definitely help in creating cognizance of the specific actions that constitute software piracy as well as acts as deterrents. Structuring these programs in a systematic manner would help in changing the social perceptions of software usage. Needless to say companies have to be proactive by implementing not only legal measures to counter software piracy but also economic measures that ensure that the prices are too prohibitively higher in emerging nations, where it is as it is very easy to pirate software. A combination of these measures of definitely serves to reduce the levels of software piracy.
REFERENCES


