

1.1 __ Introduction_ Catalyst for Change_ GEE 002-CS22S1 - General Education Elective 2	4
1.2 __ Milestones in Computing_ GEE 002-CS22S1 - General Education Elective 2	6
1.3 __ Milestones in Networking_ GEE 002-CS22S1 - General Education Elective 2	13
1.4 __ Milestones in Information Storage and Retrieval_ GEE 002-CS22S1 - General Education Elective 2	15
1.5 __ IT Issues_ GEE 002-CS22S1 - General Education Elective 2	17
2.1 __ Introduction_ GEE 002-CS22S1 - General Education Elective 2	19
2.10 Comparing Workable Ethical Theories_ GEE 002-CS22S1 - General Education Elective 2	22
2.2 Subject Relativism_ GEE 002-CS22S1 - General Education Elective 2	24
2.3 Cultural Relativism_ GEE 002-CS22S1 - General Education Elective 2	26
2.5 Ethical Egoism_ GEE 002-CS22S1 - General Education Elective 2	28
2.6 Kantianism_ GEE 002-CS22S1 - General Education Elective 2	30
2.6.1 Evaluating a Scenario Using Kantianism_ GEE 002-CS22S1 - General Education Elective 2	34
2.7 Utilitarianism_ GEE 002-CS22S1 - General Education Elective 2	36
2.8 Social Contract Theory_ GEE 002-CS22S1 - General Education Elective 2	42
2.9 Virtue Ethics_ GEE 002-CS22S1 - General Education Elective 2	45

2.9.1 Making a Decision Using Virtue Ethics_ GEE 002-CS22S1 - General Education Elective 2	48
3.1 __ Network Communication_ GEE 002-CS22S1 - General Education Elective 2	50
3.1.1 __ Attributes of the Web_ GEE 002-CS22S1 - General Education Elective 2	54
3.1.2 __ Censorship_ GEE 002-CS22S1 - General Education Elective 2	57
3.2 __ Intellectual Property_ GEE 002-CS22S1 - General Education Elective 2	61
3.2.1 __ Digital Rights Management_ GEE 002-CS22S1 - General Education Elective 2	66
3.2.2 __ Software Copyright_ GEE 002-CS22S1 - General Education Elective 2	69
4.1 __ Information Privacy (Data Privacy)_ GEE 002-CS22S1 - General Education Elective 2	73
4.1.1 __ Know Your Rights_ GEE 002-CS22S1 - General Education Elective 2	77
4.2 __ Computer and Network Security_ GEE 002-CS22S1 - General Education Elective 2	79
4.2.1 __ Hackers (Past and Present)_ GEE 002-CS22S1 - General Education Elective 2	81
4.2.2 __ Malware_ GEE 002-CS22S1 - General Education Elective 2	83
4.3 __ Cyber Crime and Cyber Attacks_ GEE 002-CS22S1 - General Education Elective 2	91
5.1 __ Computer Reliability_ Introduction_ GEE 002-CS22S1 - General Education Elective 2	97
5.2 __ Data Entry or Data Retrieval Errors_ GEE 002-CS22S1 - General Education Elective 2	99

5.3 __ Computer Simulation_ GEE 002-CS22S1 - General Education Elective 2	103
5.4 __ Software Engineering_ GEE 002-CS22S1 - General Education Elective 2	105
6.1.2 __ Whistle-Blowing_ GEE 002-CS22S1 - General Education Elective 2	107
6.2 __ Work and Wealth_ GEE 002-CS22S1 - General Education Elective 2	110
Midterm Examination in GEE 002_ GEE 002-CS22S1 - General Education Elective 2	118
Prelim-Exam_GEE-002	141
Summary_ Catalyst for Change_ GEE 002-CS22S1 - General Education Elective 2	145
Summary_ Computer Reliability_ GEE 002-CS22S1 - General Education Elective 2	146
Summary_ Introduction to Ethics_ GEE 002-CS22S1 - General Education Elective 2	147
Summary_ Network Communication and Intellectual Property_ GEE 002-CS22S1 - General Education Elective 2	149

1.1 || Introduction: Catalyst for Change

Introduction: Catalyst for Change

In the past two decades alone, we have witnessed the emergence of exciting new technologies, including smartphones, MP3 players, digital photography, email, and the World Wide Web. There is good reason to say we are living in the Information Age.

The **two principal catalysts** for the Information Age have been:

- low-cost computers
- high-speed communication networks



Figure 1.1 Low-cost computers and high-speed communication networks make possible the products of the Information Age, such as the Samsung Note 10 Plus. It functions as a phone, email client, Web browser, camera, video recorder, digital compass, and more.

Our relationship with technology is complicated. We create technology and choose to adopt it. However, once we have adopted a technological device, it can transform us and how we relate to other people and our environment. Adopting technology can change our perceptions. New technologies are adopted to solve problems, but they often create problems.

NOTE: Click the "Next" button to proceed.

1.2 || Milestones in Computing

Milestones in Computing

Calculating devices have supported the development of commercial enterprises, governments, science, and weapons. As you will see in this section, the introduction of new technologies has often had a social impact.

- Aids to manual calculating
- Mechanical calculators
- Cash register
- Punched card tabulation
- Precursors of commercial computers
- First commercial computers
- Programming languages and time-sharing
- Transistor and integrated circuit
- IBM System/360
- Microprocessor
- Personal computer

1. Aids to Manual Calculating

Fingers and toes are handy calculation aids, but to manipulate numbers above 20, people need more than their own digits.

The three important aids to manual calculating are:

- **tablet** - Simply having a tablet to write down the numbers being manipulated is a great help. In ancient times, erasable clay and wax tablets served this purpose. By the late Middle Ages, Europeans often used erasable slates. Paper tablets became common in the nineteenth century, and they are still popular today.
- **abacus** - is a computing aid in which a person performs arithmetic operations by sliding counters along with rods, wires, or lines.
- **mathematical tables**
 - **Tables of logarithms** (17th century) - time savers to anyone doing complicated math because they allowed them to multiply two numbers by simply adding their logarithms
 - John Napier and Johannes Kepler published tables of logarithms

- **Income tax tables** (today) - people who compute their income taxes “by hand” make use of tax tables to determine how much they owe.

However, even with them manual calculating is slow, tedious, and error-prone



(https://commons.wikimedia.org/wiki/File:Tablet_with_wax_and_stylus_Roman_times.jpg#/media/File:T)

Figure 1. Tablet

2. Mechanical Calculators

- The 17th -19th century
 - **Blaise Pascal** - "Pascal's calculator" - built-in 1640, was capable of adding whole numbers containing up to six digits
 - **Gottfried Leibniz** - "Step Reckoner" - a handcrafted machine that can add, subtract, multiply, and divide whole numbers
 - **Charles Thomas de Colmar** - "Arithmometer" - the first commercially successful calculator
 - **Georg Scheutz and his son Edvard** - "Scheutz difference engine" - the world's first printing calculator:
a machine capable of calculating mathematical tables and typesetting the values onto molds.
 - **William Burroughs** - "Burroughs Adding Machine" - devised a practical adding machine
- **Social Change -> Market for Calculators**
 - Gilded Age (late 19th century America)
 - Rapid industrialization
 - Economic expansion
 - Concentration of corporate power
- **Calculator Adoptions -> Social Change**
 - Fierce competition in calculator market

- Continuous improvements in size, speed, ease of use
- Sales increased rapidly
- The adoption of mechanical calculators led “Deskilling” and feminization of bookkeeping
 - People of average ability quite productive
 - Calculators are 6’ faster than adding by hand
 - Wages dropped
 - Women replaced men



FIGURE 1.4 Mechanical calculators led to the “de-skilling” and “feminization” of book-keeping. (Underwood Archives/Getty Images)

3. Cash register

- Store owners of late 1800s faced problems
 - Keeping accurate sales records for department stores
 - Preventing embezzlement from clerks
- Response to problems: cash register
 - **James and John Ritty** - designed an adding machine capable of expressing values in dollars and cents
 - Created printed, itemized receipts
 - Maintained printed log of transactions
 - Rang bell every time drawer was opened



(<https://commons.wikimedia.org/w/index.php?curid=8029421>).

Figure 1. Cash Register

4. Punched card tabulation

Herman Hollerith - developed an electromechanical tabulating machine for punched cards to assist in summarizing information and in accounting.

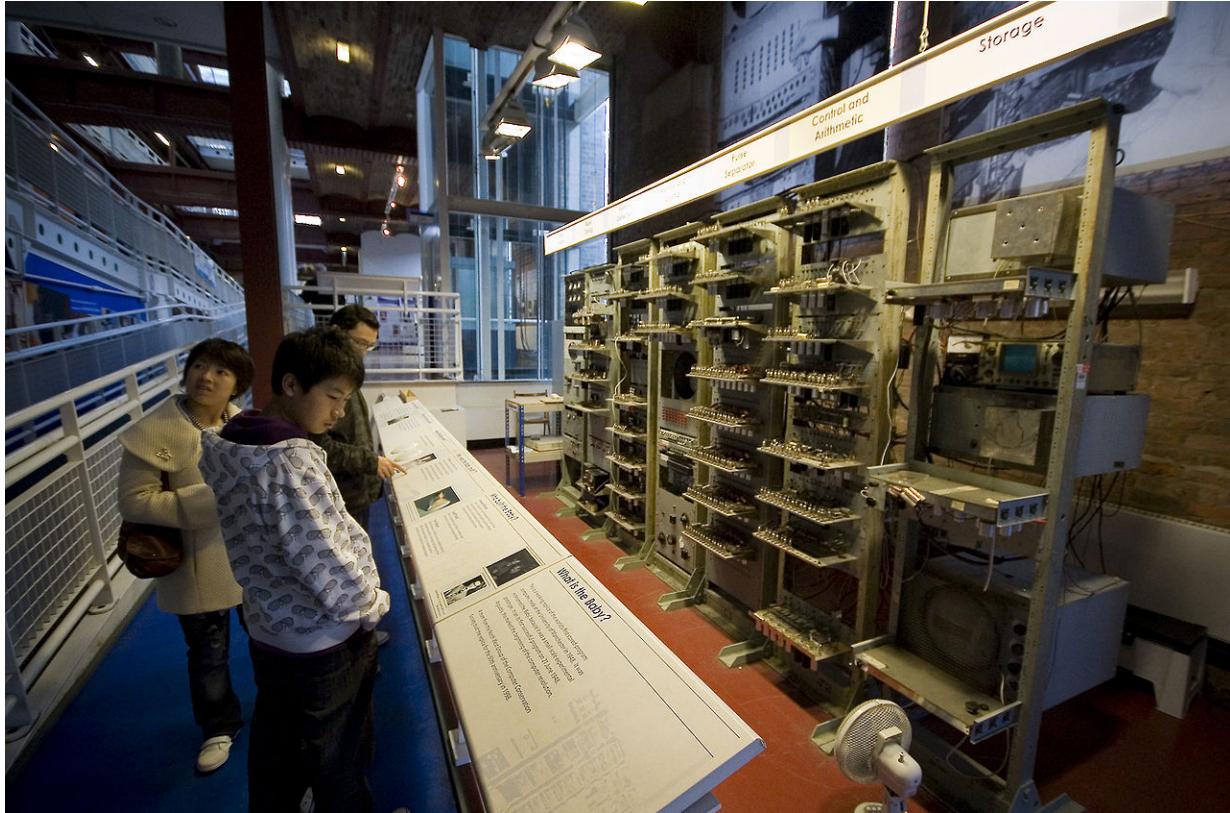


(<https://commons.wikimedia.org/wiki/File:HollerithMachine.CHM.jpg#/media/File:HollerithMachine.CHM.jpg>)

5. Precursors (Ancestors) of Commercial Computers

A team at the University of Manchester set out to build a small computer. The computer successfully executed its first program in 1948.

The Small-Scale Experimental Machine was the first operational, fully electronic computer system that had both programs and data stored in its memory.



[Manchester Baby](https://en.wikipedia.org/wiki/Manchester_Baby) replica (SSEM)

at the [Museum of Science and Industry](https://en.wikipedia.org/wiki/Museum_of_Science_and_Industry_(Manchester))

([https://en.wikipedia.org/wiki/Museum_of_Science_and_Industry_\(Manchester\)](https://en.wikipedia.org/wiki/Museum_of_Science_and_Industry_(Manchester)))

(By Parrot of Doom - Own work, CC BY-SA 3.0,

<https://commons.wikimedia.org/w/index.php?curid=8318181>

(<https://commons.wikimedia.org/w/index.php?curid=8318181>)

6. First commercial computers

Ferranti Ltd - introduced the world's first commercial computer in 1951

- **FerrantiMark 1**

- a descendant of research computers constructed at the University of Manchester

Remington-Rand

- Completed UNIVAC in 1951
- Delivered to U.S. Bureau of the Census
- Predicted winner of 1952 Pres. Election

IBM (entered the commercial market in 1953)

- Larger base of customers
- Far superior sales and marketing organization
- Greater investment in research and development
- Dominated mainframe market by mid-1960s

7. Programming Languages and Time-sharing

- Assembly language
 - Symbolic representations of machine instructions
 - Programs just as long as machine language programs
- FORTRAN (1957)
 - First higher-level language (shorter programs)
 - Designed for scientific applications
- COBOL (1959)
 - U.S. Department of Defense standard
 - Designed for business applications
- Time-Sharing Systems (In the early 1960s)
 - Divide computer time among multiple users
 - Users connect to a computer via terminals
 - Cost of ownership spread among more people
 - Gave many more people access to computers
- BASIC (In the early 1960s)
 - Developed at Dartmouth College
 - Simple, easy-to-learn programming language
 - Popular language for teaching programming

8. Transistor and Integrated Circuit

- Transistor
 - Replacement for vacuum tube
 - Invented at Bell Labs (1948)
- Semiconductor
 - Faster
 - Cheaper
 - More reliable
 - More energy-efficient
- Integrated Circuit: Semiconductor containing transistors, capacitors, and resistors
 - Advantages over parts they replaced
- Smaller
- Faster

- More reliable
- Less expensive

9. IBM System/360

- Before System/360
 - IBM dominated the mainframe market in the 1960s
 - IBM computers were incompatible
 - Switch computers ® rewrite programs
- System/360 (1964)
 - Series of 19 computers with varying levels of power
 - All computers could run the same programs - Compatible
 - Upgrade without rewriting programs

10. Microprocessor & Personal Computer

- Microprocessor: Computer inside a single semiconductor chip
 - Invented in 1971 at Intel
 - Made personal computers practical
- Example of first PCs
 - Altair 8800 (1975)
 - Personal computers became popular
- Apple Computer: Apple II
 - Developments draw businesses to personal computers
- IBM launches IBM PC

1.3 || Milestones in Networking

Milestones in Networking

- Discoveries in electromagnetism (early 1800s)
- Telegraph (1844)
 - A **telegraph** is a machine used to transmit messages in the form of electrical impulses that can be converted into data
- Telephone (1876) - invented by Alexander Graham Bell
- Typewriter and teletype (1873, 1908)
 - Christopher Sholes, Carlos Glidden, and Samuel Soule patented the first typewriter
 - In late 1873 Remington & Sons Company, famous for guns and sewing machines, produced the first commercial typewriter.
 - In 1908, the typewriter was modified to print a message transmitted over a telegraph line; the inventors called the invention, a teletype
- Radio (1895)
- Television (1927)
 - Broadcasting video over a wire began in 1884 with the invention of an electromechanical television by Paul Nipkow, but the first completely electronic television transmission was made in 1927 by Philo Farnsworth.
- Remote computing (1940)
 - In 1940 George Stibitz demonstrated remote computing to members of the American Mathematical Society who were meeting at Dartmouth College in New Hampshire. He typed numbers into the teletype, which transmitted the data 250 miles to the calculator in New York City. After the calculator had computed the answer, it transmitted the data back to the teletype, which printed the result.
- ARPANET - Advanced Research Projects Agency Network (1969)
 - In 1967 ARPA initiated the design and construction of the ARPANET
 - first wide-area packet-switching network with distributed control and the first network to implement the TCP/IP protocol suite
- Email (1972)
 - In March 1972, Ray Tomlinson - wrote the first software enabling email messages to be sent and received by ARPANET computers.
 - A few months later, Lawrence Roberts created the first “killer app” for the network: an email utility that gave individuals the ability to list their email messages selectively read them, reply to them, forward them.
- Internet (1983)

- network of networks communicating using TCP/IP
- Broadband (2000)
- Broadband
 - High-speed Internet connection
 - At least 10x faster than a dial-up connection
 - Enhanced by fiber-optic networks
 - South Korea is the world leader in broadband networking. 3/4 of homes have broadband connections

NOTE: Click the "Next" button to proceed.

1.4 || Milestones in Information Storage and Retrieval

Milestones in Information Storage and Retrieval

This section focuses on the development of technologies to store and retrieve information.

- **Newspapers**

- The first English-language newspaper appeared in Great Britain in the 1600s.

- **Hypertext**

- In 1965, Ted Nelson coined the word **hypertext**, which refers to a linked network of nodes containing information.

- The links allow readers to visit the nodes in a nonlinear fashion

- **Graphical User Interface**

- **Douglas Engelbart** created a research lab called the Augmentation Research which developed a hypermedia and groupware system called **NLS (oNLine System)** Center.

- **NLS system** was the first to employ the practical use of hypertext links, the mouse, raster-scan video monitors, information organized by relevance, screen windowing, presentation programs, and other modern computing concepts.

- **Engelbart** invented several new input devices, including the **computer mouse**.

- In 1970 Xerox Palo Alto Research Center (PARC), a new facility dedicated to performing research into digital technology created the **Alto**, a small minicomputer designed to be used by a single person.

- The **Alto** incorporated a bitmapped display, a keyboard, and a mouse.

- Apple released **Lisa** (1983) -the first commercial computer with a GUI, or Graphical User Interface

- The price tag was too high, the processor was too slow, and the Lisa was not commercially successful

- Apple released the **Macintosh** (1984), a faster computer with a graphical user interface.

- **World Wide Web (1990)**

- Tim Berners-Lee completed the first Web browser on the NeXT Computer (1990) - called his browser **WorldWideWeb**

- The first widely used Web browser was **Mosaic**, developed at the University of Illinois, Urbana-Champaign
 - Today, the most popular web browsers
 - Chrome
 - Internet Explorer
 - Firefox
 - Safari
- **Search Engines**
 - A **search engine** is a program that accepts a list of keywords from a user, searches a database of documents, and returns those documents most closely matching the specified keywords.
 - There are **two types of Web search engines**
 - **Crawler-based search engines**, such as Google and AltaVista, automatically create the database of information about Web pages.
 - In a process similar to Web surfing, programs called spiders follow hyperlinks, eventually visiting millions of different Web pages.
 - Summary information about these pages is collected into massive databases.
 - When you perform a query, the search engine consults its database to find the closest matches.
 - **Human-powered search engines** - The second type of Web search engine **relies upon humans to build the database of information about various Web pages**.
 - People who develop a Web site can submit a summary of their site to the keepers of the search engine.
 - The advantage of this kind of search engine is that humans can create more accurate summaries of a web page than a spider program. The disadvantage of this approach is that only a small fraction of the web can be cataloged.

NOTE: Click the "Next" button to proceed.

1.5 || IT Issues

Milestones in Networking

Information technology (IT) refers to devices used in the creation, storage, manipulation, exchange, and dissemination of data, including text, sound, and images.

People are making greater use of IT in their everyday lives. Some of these uses create new issues that need to be resolved.

Let's look at a few of the questions raised by the growth of IT.

- Email
 - allows anyone to send email to anyone else with an email address
 - most email traffic is spam: unsolicited, bulk, commercial email. Is spam destroying the value of email?
- The World Wide Web has provided an unprecedented opportunity for individuals and nongovernmental organizations to have their points of view made available to billions.
 - Will the web be a channel for democratic ideas?
 - Another tool for totalitarian governments?
- Use of credit card to purchase an item
 - the credit card company now has information
 - does the credit card company have a right to sell my name, address, and phone number to other companies that may want to sell me related products?
- Computers are now embedded in many devices on which we depend, from traffic signals to pacemakers. Software errors have resulted in injury and even death. When bugs result in harm to humans, what should the liability be for the people or corporations that produced the software?
- When employees use IT devices in their work, companies can monitor their actions closely.
 - How does such monitoring affect the workplace? Does it create an unacceptable level of stress among employees?
- IT is allowing more people than ever to work from home. What are the advantages and disadvantages of telecommuting?
- IT capabilities are leading to changes in the IT industry.
 - US-based software companies are doing more development in countries where salaries are much lower, such as India, China, and Vietnam. Will this trend continue? How many software jobs in the United States will be lost to countries where labor is significantly cheaper?

NOTE: Click the "Next" button to proceed.

2.1 || Introduction

Introduction

Forming communities allows us to enjoy better lives than if we lived in isolation. Communities prohibit certain actions and make other actions obligatory. Those who do not conform to these prohibitions and obligations can be punished.

Responsible community members take the needs and desires of other people into account when they make decisions. They recognize that virtually everybody shares the “core values” of life, happiness, and the ability to accomplish goals.

In this chapter, we describe the difference between morality and ethics, discuss a variety of ethical theories, evaluate their pros and cons, and show how to use the more viable ethical theories to solve moral problems.

Defining Terms

A **society** is an association of people organized under a system of rules designed to advance the good of its members over time.

Every society has rules of conduct describing what people ought and ought not to do in various situations. We call these rules **morality**.

Ethics is the philosophical study of morality, a rational examination into people’s moral beliefs and behavior.

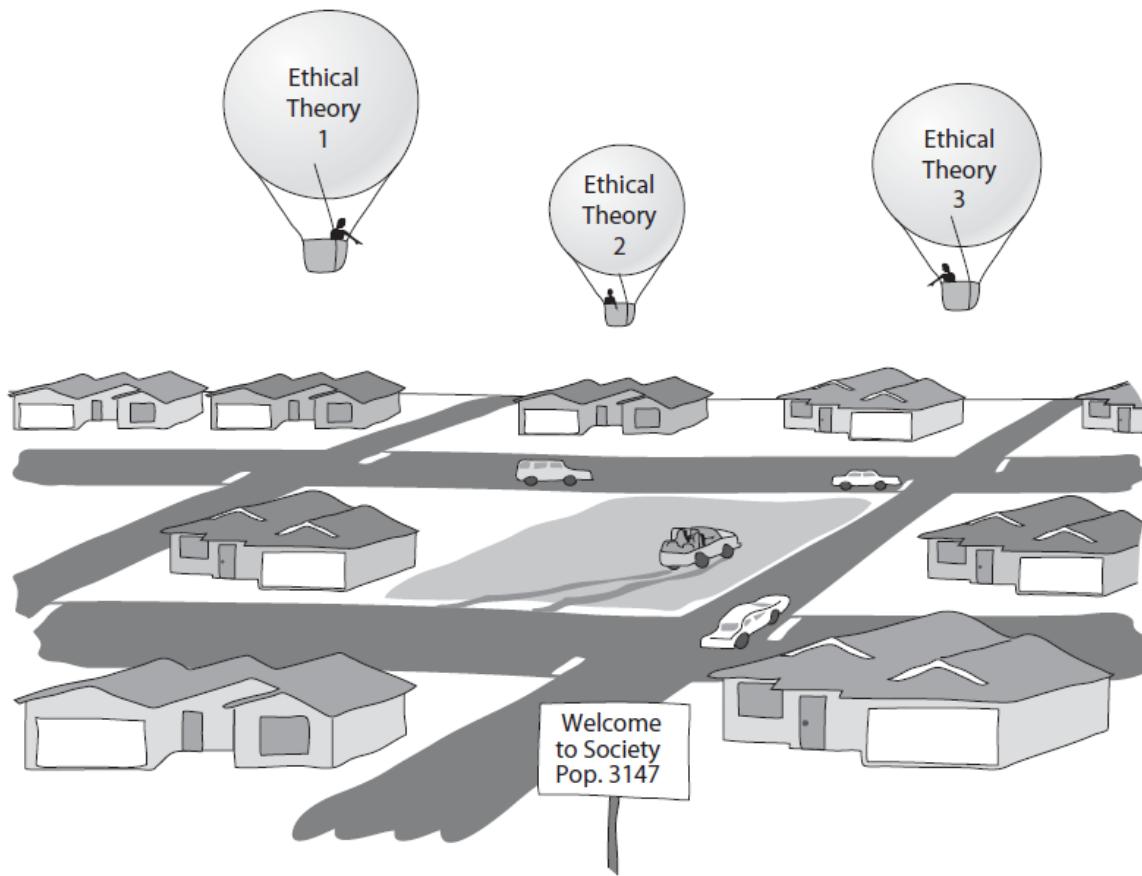


FIGURE 2.2 An analogy explaining the difference between ethics and morality. Imagine society as a town. Morality is the road network within the town. People doing ethics are in balloons floating above the town.

Source: Ethics for the Information Age (p. 51), by M. Quiin, Addison-Wesley. Copyright © 2015, 2013, 2011 by Pearson Education, Inc.,

Society is like a town full of people driving cars. Morality is the road network within the town. People ought to keep their cars on the roads. Those who choose to “do ethics” are in balloons floating above the town.

From this perspective, an observer can evaluate individual roads (particular moral guidelines) as well as the quality of the entire road network (moral system).

The observer can also judge whether individual drivers are staying on the roads (acting morally) or taking shortcuts (acting immorally).

Finally, the observer can propose and evaluate various ways of constructing road networks (alternative moral systems).

While there may, in fact, be a definite answer regarding the best way to construct and operate a road network, it may be difficult for the observers to identify and agree upon this answer, because each observer has a different viewpoint.

Overview of Ethical Theories

The formal study of ethics goes back at least 2,400 years, to the Greek philosopher Socrates. Socrates did not put any of his philosophy in writing, but his student Plato did.

In Plato's dialogue called the Crito, imprisoned Socrates uses ethical reasoning to explain why he ought to face an unjust death penalty rather than take advantage of an opportunity to flee into exile with his family.

There are many proposed ethical theories and we're going to examine some of them. In this chapter, we consider nine ethical theories - nine frameworks for moral decision making.

The workable theories will be those that make it possible for a person to present a persuasive, logical argument to a diverse audience of skeptical, yet open-minded people.

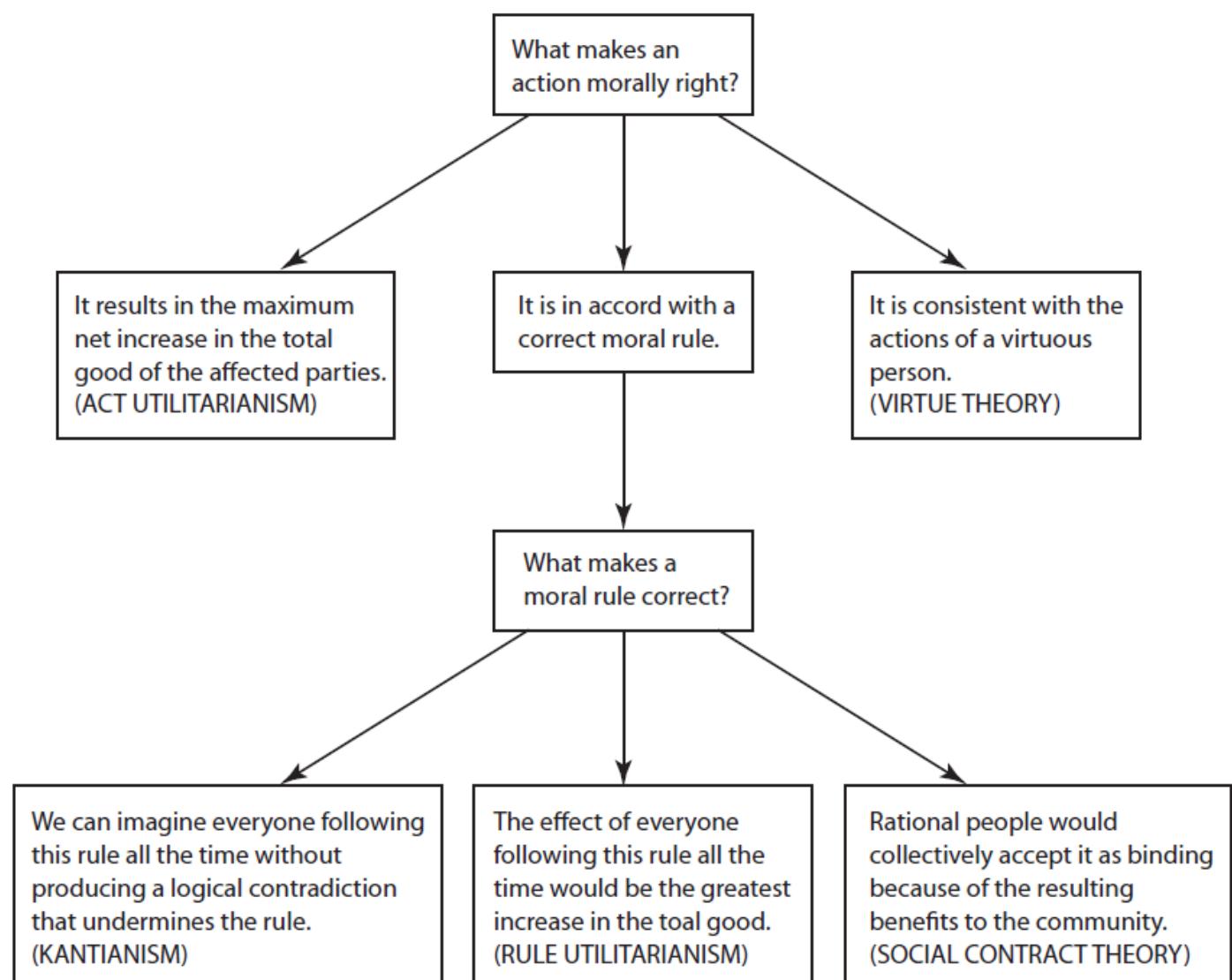
Nine Ethical Theories to be discussed in this lesson:

1. Subject Relativism
2. Cultural Relativism
3. Divine Command Theory
4. Ethical Egoism
5. Kantianism
6. Act Utilitarianism
7. Rule Utilitarianism
8. Social Contract Theory
9. Virtue Ethics

2.10 Comparing Workable Ethical Theories

Comparing Workable Ethical Theories

The divine command theory, ethical egoism, Kantianism, act utilitarianism, rule utilitarianism, social contract theory, and virtue ethics share the viewpoint that moral good and moral precepts are objective. In other words, morality has an existence outside the human mind. For this reason, we say these theories are examples of objectivism.



Source: Ethics for the Information Age by M. Quiin, Addison-Wesley. Copyright © 2015, 2013, 2011 by Pearson Education, Inc.,

What distinguishes ethical egoism, Kantianism, utilitarianism, social contract theory, and virtue ethics from the divine command theory is the assumption that ethical decision making is a rational process by which people can discover objective moral principles with the use of logical reasoning based on facts and commonly held values.

Kantianism, utilitarianism, social contract theory, and virtue ethics explicitly take other people into consideration when defining what makes an action morally correct, which sets these theories apart from ethical egoism.

Of all the theories we have considered, we conclude that Kantianism, act utilitarianism, rule utilitarianism, social contract theory, and virtue ethics are the most workable.

NOTE: Click the "Next" button to proceed.

2.2 Subject Relativism

Subject Relativism

Relativism is the theory that there are no universal moral norms of right and wrong.

According to this theory, different individuals or groups of people can have completely opposite views of a moral problem, and both can be right.

Two particular kinds of relativism

1. subjective relativism
2. cultural relativism

Subjective relativism holds that each person decides right and wrong for himself or herself. This notion is captured in the popular expression, “What’s right for you may not be right for me.”

*Holds the idea that each individual person decides what is right or wrong for themselves

The Case for Subjective Relativism

1. Well-meaning and intelligent people may have opposite opinions about moral issues
 - For example, the issue of legal abortion in the United States. There are a number of rational people on each side of the issue. Subjective realists would base their own opinion upon their morality of what they see to be right or wrong not what society or the government claim to be fair and true. Instead, each of us creates his or her own morality.
2. Ethical debates are disagreeable and pointless.
 - Going back to the example of abortion, the debate in the United States has been going on for more than 40 years. An agreement about whether abortion is right or wrong may never be reached.

The Case against Subjective Relativism

1. With subjective relativism, the line between doing what you think is right and doing what you want to do is not sharply drawn.
2. By allowing each person to decide right and wrong for himself or herself, subjective relativism makes no moral distinction between the actions of different people.

- The fact is that some people have caused millions to suffer, while others have led lives of great service to humanity.
- a statement of the form, “I can decide what’s right for me, as long as my actions don’t hurt anyone else,” is inconsistent with subjective relativism.

3. Subjective relativism and tolerance are two different things.

- Some people may be attracted to relativism because they believe in tolerance (open-minded).
- It allows individuals in a pluralistic society like the United States to live in harmony.
- However, tolerance is not the same thing as subjective relativism. Subjective relativism holds that individuals decide for themselves what is right and what is wrong.
- If you are a tolerant person, is it okay with you if some people decide they want to be intolerant? What if a person decides that he will only deal fairly with people of his own racial group?
- Relativism is based on the idea that there are no universal moral norms, so a blanket statement about the need for tolerance is incompatible with subjective relativism.

4. We should not give legitimacy to an ethical theory that allows people to make decisions based on something other than reason.

- If individuals decide for themselves what is right and what is wrong, they can reach their conclusions by any means they see fit. They may choose to base their decisions on something other than logic and reason, such as the rolling of dice or the turning of tarot cards. This path is contrary to using logic and reason.

*If your goal is to persuade others that your solutions to actual moral problems are correct, adopting subjective relativism is self-defeating because it is based on the idea that each person decides for himself or herself what is right and what is wrong.

*According to subjective relativism, nobody’s conclusions are any more valid than anyone else’s, no matter how these conclusions are drawn. Therefore, we reject subjective relativism as a workable ethical theory.

NOTE: Click the "Next" button to proceed.

2.3 Cultural Relativism

Cultural Relativism

Cultural relativism is the ethical theory that the meaning of “right” and “wrong” rests with a society’s actual moral guidelines.

- A particular action may be right in one society at one time and wrong in other society or at another time
 - Ex. (driving with a friend and killing a pedestrian)
 - (90% in Norway, 10% in Serbia, 50% in Mexico will not testify)

Case for Cultural Relativism

1. Different social contexts demand different moral guidelines.
 - It’s unrealistic to assume that the same set of moral guidelines can be expected to work for all human societies in every part of the world for all ages.
2. It is arrogant for one society to judge another.
 - We may have more technology than people in other societies, but we are no more intelligent than they are. It is arrogant for a person living in twenty-first-century Italy to judge the actions of another person who lived in the Inca Empire in the fifteenth century.

The Case against Cultural Relativism

1. Just because two societies do have different views about right and wrong doesn’t imply that they ought to have different views.
2. Cultural relativism does not explain how an individual determines the moral guidelines of a particular society.
3. Cultural relativism does not explain how to determine right from wrong when there are no cultural norms.
4. Cultural relativism does not do a good job of characterizing actions when moral guidelines evolve.
5. Cultural relativism provides no framework for reconciliation between cultures in conflict.
6. The existence of many acceptable cultural practices does not imply that any cultural practice would be acceptable.
7. Societies do, in fact, share certain core values.
8. Cultural relativism is only indirectly based on reason.

Cultural relativism has significant weaknesses as a tool for ethical persuasion. According to cultural relativism, the ethical evaluation of a moral problem made by a person in one society may be meaningless when applied to the same moral problem in another society. Cultural relativism

suggests there are no universal moral guidelines. It gives tradition more weight in ethical evaluations than facts and reason. For these reasons, cultural relativism is not a powerful tool for constructing ethical evaluations persuasive to a diverse audience, and we consider it no further.

For more information, watch this video:

About Culture Relativism



NOTE: Click the "Next" button to proceed.

2.5 Ethical Egoism

Ethical Egoism

is the philosophy that each person should focus exclusively on his or her self-interest.

- In other words, according to ethical egoism, the morally right action for a person to take in a particular situation is the action that will provide that person with the maximum long-term benefit.
- Ethical egoism does not prohibit acting to help someone else but assisting another is the right thing to do if and only if it is in the helper's own long-term best interest.

The Case for Ethical Egoism

1. Ethical egoism is a practical moral philosophy.
2. It's better to let other people take care of themselves.
3. The community can benefit when individuals put their well-being first.
4. Other moral principles are rooted in the principle of self-interest.

The Case against Ethical Egoism

1. An easy moral philosophy may not be the best moral philosophy.
2. We do, in fact, know a lot about what is good for someone else.
3. A self-interested focus can lead to blatantly immoral behavior.
4. Other moral principles are superior to the principle of self-interest.
5. People who take the good of others into account live happier lives.

Ethical egoism does not respect the ethical point of view: it does not recognize that in order to reap the benefits of living in a community, individuals must consider the good of other community members. For this reason, we reject ethical egoism as a workable ethical theory.

For more information about Ethical egoism, watch this video:

About Ethical Egoism



NOTE: Click the "Next" button to proceed.

2.6 Kantianism

Kantianism

Kantianism is the name given to the ethical theory of the German philosopher **Immanuel Kant** (1724–1804).

Kant believed that people's actions ought to be guided by moral laws and that these moral laws were universal. He held that in order to apply to all rational beings, any supreme principle of morality must itself be based on reason.

Many of the moral laws Kant describes can also be found in the Bible, Kant's methodology allows these laws to be derived through a reasoning process.

A Kantian is able to go beyond simply stating that an action is right or wrong by citing chapter and verse; a Kantian can explain why it is right or wrong.

Kant viewed morality not in terms of hypothetical imperatives, but through what he called categorical imperatives.

Categorical Imperative (First Formulation)

Act only according to that maxim whereby you can, at the same time, will that it should become a universal law.

***universal law** - something that must be done in similar situations

***autonomous** - acting in accordance with one's moral duty rather than one's desires.

This version, known as the formula of the universal law, tells us to "act only on that maxim that you could consistently will to be a universal law." The maxim of our action is the subjective principle that determines our will. We act for our own reasons. Different intentions might lead to similar actions. When I want to make myself a bit more presentable, I shave and shower. Others might perform the same action for a different reason. We can identify different maxims in terms of these different reasons or intentions. For Kant, intentions matter. He evaluates the moral status of actions not according to the action itself or according to its consequences, but according to the maxim of the action. The moral status of an action is determined by the actor's intentions or reasons for acting.

According to the formula of the universal law, what makes an action morally acceptable is that its maxim is universalizable. That is, morally permissible action is action that is motivated by an intention that we can rationally will that others act on similarly. A morally prohibited action is just

one where we can't rationally will that our maxim is universally followed. Deception and threat are both paradigm cases of acting wrongly according to Kant. In both cases, our maxim involves violating the autonomy of another rational being and this is something that we, as rationally autonomous beings ourselves, could not consistently will to be a universal law.

According to Kant, there is a contradiction involved in a rational autonomous being willing that autonomy be universally coercively or deceptively violated. This would involve a rational autonomous being willing the violation of its own rational autonomy. Acting out of moral duty is a matter of acting only on maxims that we can rationally will others act on as well. The person of good will recognizes the humanity of others by not making any special exception for herself even when her interests or inclination would be served by doing so.

*So as a Kantian, before I act, I would ask myself, what's the general rule that stands behind the particular action I'm considering?

Categorical Imperative (Second Formulation)

Act so that you always treat both yourself and other people as ends in themselves, and never only as a means to an end.

*It is wrong for one person to "use" another. Instead, every interaction with other people must respect them as rational beings.

a means to an end - something that you do because it will help you to achieve something else
ends in themselves - A purpose or goal desired for its own sake (rather than to attain something else).

The second formulation, tells us to treat individuals as ends in themselves. That is just to say that persons should be treated as beings that have intrinsic value. To say that persons have intrinsic value is to say that they have value independent of their usefulness for this or that purpose.

The second formulation of CI does not say that you can never use a person for your own purposes. But it tells us we should never use a person merely as a means to your own ends. What is the difference? We treat people as a means to our own ends in ways that are not morally problematic quite often.

When I go to the post office, I treat the clerk as a means to my end of sending a letter. But I do not treat that person merely as a means to an end. I pursue my end of sending a letter through my interaction with the clerk only with the understanding that the clerk is acting autonomously in serving me. My interaction with the clerk is morally acceptable so long as the clerk is serving me voluntarily, or acting autonomously for his own reasons.

By contrast, we use people merely as a means to an end if we force them to do our will, or if we deceive them into doing our will. Threat and deception are paradigm violations of the Categorical Imperative. In threatening or deceiving another person, we disrupt his or her autonomy and his or

her will. This is what the Categorical Imperative forbids. Respecting persons requires refraining from violating their autonomy.

The Case for Kantianism

1. The Categorical Imperative aligns with the common moral concern, “What if everybody acted that way?”
 - According to Kantianism, it is wrong for you to act in a particular way if you cannot wish everyone in a similar circumstance to do the same thing.
2. Kantianism produces universal moral guidelines.
 - Kantianism aligns with the intuition of many people that the same morality ought to apply to all people for all of history. These guidelines allow us to make clear moral judgments.
 - For example, one such judgment might be the following: “Sacrificing living human beings to satisfy the gods is wrong.” It is wrong in Europe in the twenty-first century, and it was wrong in South America in the fifteenth century.
3. All persons are treated as moral equals.
 - A popular belief is that “all people are created equal.” Because it holds that people in similar situations should be treated in similar ways, Kantianism provides an ethical framework to combat discrimination.

The Case against Kantianism

1. Sometimes no single rule fully characterizes an action.
2. Sometimes there is no way to resolve a conflict between rules.
3. Kantianism allows no exceptions to perfect duties.

*While these objections point out weaknesses with Kantianism, the theory does support moral decision making based on logical reasoning from facts and commonly held values. It is culture neutral and treats all humans as equals. Hence it meets our criteria for a workable ethical theory and we will use it as a way of evaluating moral problems.

For more information about Kantianism, please watch this video:

Kant & Categorical Imperatives: Crash Course Philosophy #35



References:

Russ W. Payne. Respect for Persons - Kant's Moral Theory. 2019. Retrieved from

[https://human.libretexts.org/Bookshelves/Philosophy/Book%3A_An_Introduction_to_Philosophy_\(Payne\)/10%3A_Right_Action/10.02%3A_Respect_for_Persons_-_Kant%E2%80%99s_Moral_Theory](https://human.libretexts.org/Bookshelves/Philosophy/Book%3A_An_Introduction_to_Philosophy_(Payne)/10%3A_Right_Action/10.02%3A_Respect_for_Persons_-_Kant%E2%80%99s_Moral_Theory)

NOTE: Click the "Next" button to proceed.

2.6.1 Evaluating a Scenario Using Kantianism

Evaluating a Scenario Using Kantianism

Scenario

Carla is a single mother who is working hard to complete her college education while taking care of her daughter. Carla has a full-time job and is taking two evening courses per semester. If she can pass both courses this semester, she will graduate. She knows her child will benefit if she can spend more time at home. One of her required classes is modern European history. In addition to the midterm and final examinations, the professor assigns four lengthy reports, which is far more than the usual amount of work required for a single class. Students must submit all four reports in order to pass the class. Carla earns an A on each of her first three reports. At the end of the term, she is required to put in a lot of overtime where she works. She simply does not have time to research and write the final report. Carla uses the web to identify a company that sells term papers. She purchases a report from the company and submits it as her own work. Was Carla's action morally justifiable?

Analysis

Many times it is easier to use the second formulation of the Categorical Imperative to analyze a moral problem from a Kantian point of view, so that's where we begin. By submitting another person's work as her own, Carla treated her professor as a means to an end. She deceived her professor with the goal of getting credit for someone else's work. It was wrong for Carla to treat the professor as a grade-generating machine rather than a rational agent with whom she could have communicated her unusual circumstances. We can also look at this problem using the first formulation of the Categorical Imperative. Carla wants to be able to get credit for turning in a report she has purchased. A proposed moral rule might be, "I may claim academic credit for a report written by someone else." However, if everyone followed this rule, reports would cease to be credible indicators of the students' knowledge, and professors would not give academic credit for reports. Her proposed moral rule is self-defeating. Therefore, it is wrong for Carla to purchase a report and turn it in as her own work.

Commentary

Note that the Kantian analysis of the moral problem focuses on the will behind the action. It asks the question, "What was Carla trying to do when she submitted under her own name a term paper written by someone else?" The analysis ignores extenuating circumstances that non-Kantians may cite to justify her action.

NOTE: Click the "**Next**" button to proceed.

2.7 Utilitarianism

Utilitarianism

The English philosophers **Jeremy Bentham** (1748–1832) and **John Stuart Mill** (1806–1873) proposed a theory that is in sharp contrast to Kantianism.

According to **Bentham and Mill**, an action is good if its benefits exceed its harms, and action is bad if its harms exceed its benefits.

Their ethical theory, called **utilitarianism**, is based upon the principle of utility, also called the **Greatest Happiness Principle**.

Principle of Utility

Utility is the tendency of an object to produce happiness or prevent unhappiness for an individual or a community.

Depending on the circumstances, you may think of “happiness” as an advantage, benefit, good, or pleasure, and “unhappiness” as a disadvantage, cost, evil, or pain.

Principle of Utility (Greatest Happiness Principle)

An action is right (or wrong) to the extent that it increases (or decreases) the total happiness of the affected parties.

*The moral action is the one that produces the maximum increase in happiness. (If every possible action results in a decrease in happiness, then the moral action is the one that minimizes the decrease in happiness.)

Note that the morality of an action has nothing to do with the attitude behind the action. Bentham writes, “There is no such thing as any sort of motive that is in itself a bad one. If [motives] are good or bad, it is only on account of their effects”. We call utilitarianism a **consequentialist theory** because the focus is on the **consequences** of an action.

There are two formulations of utilitarianism: **act utilitarianism** and **rule utilitarianism**.

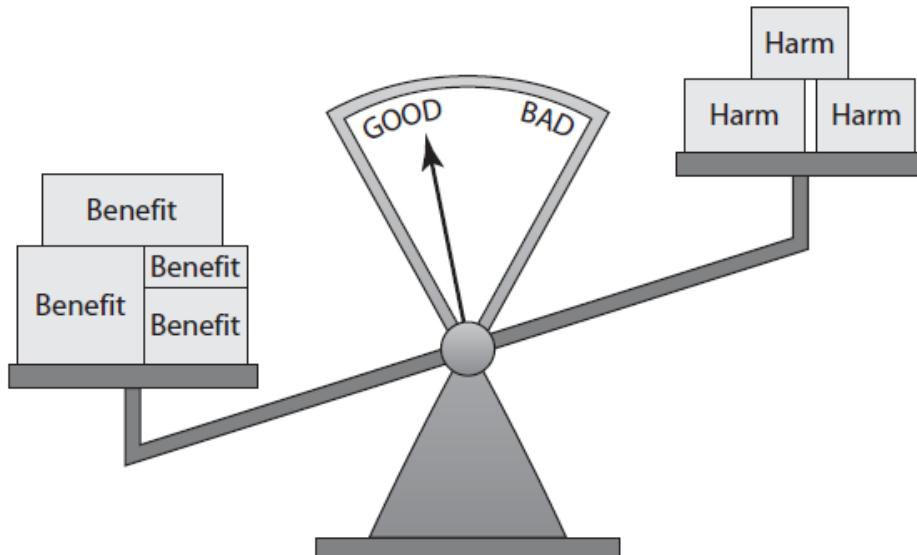


FIGURE 2.6 Utilitarianism is based on the principle of utility, which states that an action is good (or bad) to the extent that it increases (or decreases) the total happiness of the affected parties.

To understand more about Utilitarianism, please watch this video.

Utilitarianism | Ethics Defined



Act utilitarianism

Act utilitarianism is the ethical theory that an action is good if its net effect (overall affected beings) is to produce more happiness than unhappiness.

We are required to promote those acts which will result in the greatest good for the greatest number of people. The consequences of the act of giving money to charity would be considered right in act-utilitarianism, because the money increases the happiness of many people, rather than just yourself.

Case for Act Utilitarianism

- Focuses on happiness
- Down-to-earth (practical)
- Comprehensive
- Workable ethical theory

Case Against Act Utilitarianism

- Unclear whom to include in calculations
 - In the highway example children in one side might find it difficult to cross the highway
- Too much work
- Susceptible to the problem of moral luck
 - Ex: Sending flowers to a patient and causing an allergy for him. This cost him much. Then your act is BAD.

Evaluating a Scenario Using Act Utilitarianism

Scenario

A state is considering replacing a curvy stretch of highway that passes along the borders of a large city. Would building the highway be a good action?

Analysis

To perform the analysis of this problem, we must determine who is affected and the effects of the highway construction on them. Our analysis is in terms of dollars and cents. For this reason, we'll use the terms "benefit" and "cost" instead of "happiness" and "unhappiness." About 150 houses lie on or very near the proposed path of the new, straighter section of the highway. Using its power of an eminent domain, the state can condemn these properties. It would cost the state \$20 million to provide fair compensation to the homeowners. Constructing the new highway, which is three miles long, would cost the taxpayers of the state another \$10 million. Suppose the environmental impact of the new highway in terms of lost habitat for morally significant animal species is valued at \$1 million. Every weekday, 15,000 cars are expected to travel on this section of highway, which is one mile shorter than the curvy highway it replaces. Assuming it costs 40 cents per mile to operate a motor vehicle, construction of the new highway will save drivers \$6,000 per weekday in operating costs. The highway has an expected operating lifetime of 25 years. Over a 25-year period, the expected total savings to drivers will be \$39 million. We'll assume the highway project will have no positive or negative effects on any other people. Since the overall cost of the new

highway is \$31 million and the benefit of the new highway is \$39 million, building the highway would be a good action.

Commentary

Performing the benefit/cost (or happiness/unhappiness) calculations is crucial to the utilitarian approach, yet it can be controversial. In our example, we translated everything into dollars and cents. Was that reasonable? Neighborhoods are the site of many important relationships. We did not assign a value to the harm the proposed highway would do to these neighborhoods. There is a good chance that many of the homeowners would be angry about being forced out of their houses, even if they were paid a fair price for their properties. How do we put a dollar value on their emotional distress? On the other hand, we can't add apples and oranges. Translating everything into dollars and cents is one way to put everything into common units.

Rule Utilitarianism

Rule utilitarianism is the ethical theory that holds that we ought to adopt those moral rules that, if followed by everyone, lead to the greatest increase in total happiness overall affected parties. Hence a rule utilitarian applies the principle of utility to moral rules, while an act utilitarian applies the principle of utility to individual moral actions.

The rule utilitarian is looking at the consequences of the action, while the Kantian is looking at the will motivating the action.

Evaluating a Scenario Using Rule Utilitarianism

Scenario

A worm is a self-contained program that spreads through a computer network by taking advantage of security holes in the computers connected to the network. In August 2003, the Blaster worm infected many computers running the Windows 2000, Windows NT, and Windows XP operating systems. The Blaster worm caused computers it infected to reboot every few minutes. Soon another worm was exploiting the same security hole in Windows to spread through the Internet. However, the purpose of the new worm, named Nachi, was benevolent. Since Nachi took advantage of the same security hole as Blaster, it could not infect computers that were immune to the Blaster worm. Once Nachi gained access to a computer with the security hole, it located and destroyed copies of the Blaster worm. It also automatically downloaded from Microsoft a patch to the operating system software that would fix the security problem. Finally, it used the computer as a launching pad to seek out other Windows PCs with the security hole. Was the action of the person who released the Nachi worm morally right or wrong?

Analysis

To analyze this moral problem from a rule utilitarian point of view, we must think of an appropriate moral rule and determine if its universal adoption would increase the happiness of the affected

parties. In this case, an appropriate moral rule might be the following: "If I can write and release a helpful worm that improves the security of the computers it infects, I should do so."

What would be the benefits if everyone followed the proposed moral rule? Many people do not keep their computers up to date with the latest patches to the operating system. They would benefit from a worm that automatically removed their network vulnerabilities.

What harm would be caused by the universal adoption of the rule? If everyone followed this rule, the appearance of every new harmful worm would be followed by the release of many other worms designed to eradicate the harmful worm. Worms make networks less usable by creating a lot of extra network traffic. For example, the Nachi worm disabled networks of Diebold ATM machines at two financial institutions. The universal adoption of the moral rule would reduce the usefulness of the Internet while the various "helpful" worms were circulating.

Another negative consequence would be potential harm done to computers by the supposedly helpful worms. Even worms designed to be benevolent may contain bugs. If many people are releasing worms, there is a good chance some of the worms may accidentally harm data or programs on the computers they infect.

A third harmful consequence would be the extra work placed on system administrators. When system administrators detect a new worm, it is not immediately obvious whether the worm is harmful or beneficial. Hence the prudent response of system administrators is to combat every new worm that attacks their computers. If the proposed moral rule were adopted, more worms would be released, forcing system administrators to spend more of their time-fighting worms.

In conclusion, the harms caused by the universal adoption of this moral rule appear to outweigh the benefits. Therefore, the action of the person who released the Nachi worm is morally wrong.

For additional information, watch this video:

Utilitarianism: Crash Course Philosophy #36



NOTE: Click the "Next" button to proceed.

2.8 Social Contract Theory

Social Contract Theory

In this video, it explains what Social Contract Theory is

Social Contract Theory | Ethics Defined



Social Contract Theory

"Morality consists in the set of rules, governing how people are to treat one another, that rational people will agree to accept, for their mutual benefit, on the condition that others follow those rules as well."

Thomas Hobbes

- he argues that without rules and a means of enforcing them, people would not bother to create anything of value, because nobody could be sure of keeping what they created
- Instead, people would be consumed with taking what they needed and defending themselves against the attacks of others.
- To avoid this miserable condition, which Hobbes calls the "state of nature," rational people understand that cooperation is essential. However, cooperation is possible only when people mutually agree to follow certain guidelines. Hence moral rules are "simply the rules that are necessary if we are to gain the benefits of social living"

Hobbes argues that everybody living in a civilized society has implicitly agreed to two things:

1. the establishment of such a set of moral rules to govern relations among citizens, and
2. a government capable of enforcing these rules. He calls this arrangement the **social contract**.
 - Ex: residents of Baghdad after Iraq Invasion – no social contract with the state.

Jean-Jacques Rousseau - continued the evolution of social contract theory

- In an ideal society, no one is above rules that prevent society from enacting bad rules

James Rachels's Definition

“Morality consists in the set of rules, governing how people are to treat one another, that rational people will agree to accept, for their mutual benefit, on the condition that others follow those rules as well.”

Similar to Kantianism but rules are not to be universalized, but specific society should agreed upon.

John Rawls's Principles of Justice

- To avoid unequal distribution of wealth and power:
 - Each person may claim a “fully adequate” number of basic rights and liberties, so long as these claims are consistent with everyone else having a claim to the same rights and liberties
 - Any social and economic inequalities must
- Be associated with positions that everyone has a fair and equal opportunity to achieve.
 - Ex: People with same intelligence, talent, ...etc, should have the right to achieve the same position regardless of their social position.
- Be to the greatest benefit of the least-advantaged members of society (the difference principle)
 - Ex: differences in Taxes according to income

Case for Social Contract Theory

1. It is framed in the language of rights.
2. It explains why rational people act out of self-interest in the absence of a common agreement.
3. It explains why under certain circumstances the government may deprive some people of some rights.
4. It explains why under certain circumstances civil disobedience can be the morally right decision.

Case Against Social Contract Theory

- No one signed contract
- Some actions have multiple characterizations - Ex: Don't steal.
- Conflicting rights problem
 - Ex: Abortion - the privacy right of mother, against the fetus's right to live.
- May unjustly treat people who cannot uphold contract
 - Ex: Drug addicts – some countries put in prisons

Evaluating a Scenario Using Social Contract Theory

Scenario

Bill, the owner of a chain of DVD rental stores in a major metropolitan area, uses a computer to keep track of the DVDs rented by each customer. Using this information, he is able to construct profiles of the customers. For example, a customer who rents a large number of Disney titles is likely to have children. Bill sells these profiles to mail-order companies. The customers begin receiving many unsolicited mail-order catalogs. Some of the customers are happy to receive these catalogs and make use of them to order products. Others are unhappy at the increase in the amount of "junk mail" they are receiving.

Analysis

To analyze this scenario using the social contract theory, we think about the rights of the rational agents involved. In this case, the rational agents are Bill, his customers, and the mail-order companies. The morality of Bill's actions revolves around the question of whether he violated the privacy rights of his customers. If someone rents a DVD from one of Bill's stores, both the customer and Bill have information about the transaction. Are their rights to this information equal? If both the customer and Bill have equal rights to this information, then you may conclude there is nothing wrong with him selling this information to a mail-order company. On the other hand, if customers have the right to expect transactions to be confidential, you may conclude that Bill was wrong to sell this information without gaining the permission of the customer.

NOTE: Click the "Next" button to proceed.

2.9 Virtue Ethics

Virtue Ethics

Virtue ethics is a philosophy developed by Aristotle and other ancient Greeks. It is the quest to understand and live a life of moral character.

This character-based approach to morality assumes that we acquire virtue through practice. By practicing being honest, brave, just, generous, and so on, a person develops an honorable and moral character. According to Aristotle, by honing virtuous habits, people will likely make the right choice when faced with ethical challenges.

According to Aristotle, there are two kinds of virtues

1. intellectual virtues
2. moral virtues
 - these are virtues associated with reasoning and truth.
 - Moral virtues, often called virtues of character by today's writers, are habits or dispositions formed through the repetition of the relevant virtuous actions

Note, then, that moral virtue is not simply a disposition to act in a particular way, it is also a disposition to feel in a particular way. According to Aristotle, you can tell a lot about someone's character by observing what pleases them and what bothers them.

He wrote, "We may even go so far as to state that the man who does not enjoy performing noble actions is not a good man at all. Nobody would call a man just who does not enjoy acting justly, nor generous who does not enjoy generous actions, and so on."



According to Aristotle, happiness derives from living a life of virtue. You acquire moral virtues by repeating the appropriate acts.

The Case for Virtue Ethics

1. In many situations it makes more sense to focus on virtues than on obligations, rights, or consequences.
2. Personal relationships can be morally relevant to decision making.
3. Virtue ethics recognizes that our moral decision-making skills develop over time.
4. There are no irresolvable moral dilemmas.
5. Virtue ethics recognizes the important role that emotions play in living a moral life.

The Case against Virtue Ethics

1. Different people may have quite different conceptions of human flourishing.
2. Virtue ethics cannot be used to guide government policy.
3. Virtue ethics undermines attempts to hold people responsible for their bad actions.

Summary of Virtue Ethics

A right action is an action that a virtuous person, acting in character, would do in the same circumstances. A virtuous person is a person who possesses and lives out the virtues. The virtues are those character traits human beings need in order to flourish and be truly happy.

For more information about Virtue Ethics, please watch this video

Virtue Ethics | Ethics Defined



NOTE: Click the "Next" button to proceed.

2.9.1 Making a Decision Using Virtue Ethics

Making a Decision Using Virtue Ethics

Scenario

Josh is a senior majoring in computer science at a small university. All of the seniors in computer science are friends because they have taken most of their computer science courses together. Josh is particularly close to Matt. Josh and Matt are from the same city about 200 miles from campus, and Matt has given Josh rides to and from home a half dozen times at the start and end of school holidays. Notably, Matt never asked Josh to help pay for the gas on any of these trips, and Josh never offered to do so. When it is time for seniors to choose partners for their capstone project, no one is surprised when Josh and Matt end up on the same team. Unfortunately, Josh and the other teammates soon rue inviting Matt onto their team. Everyone has known Matt to be hard-working, trustworthy, and reliable, but his father just died in a car accident, and he has lost all interest in school. To make matters worse, Matt is drinking too much. He doesn't show up for a lot of the team meetings, and the code he produces doesn't meet the specifications. Josh and the other teammates can't persuade Matt to take the project more seriously, and since they don't have any real control over his behavior, they decide it's easier simply to rewrite Matt's part of the system themselves. Matt does contribute his share of the PowerPoint slides, and during the oral presentation he stands up and talks about "his" portion of the code, never mentioning that it was all rewritten by his teammates.

Everyone in the class is supposed to send the professor an email grading the performance of their teammates. The department prides itself on graduating students who have proven they can work well on software development teams, and students getting poor or failing performance reviews from all of their teammates may be forced to repeat the class. Matt comes to Josh, tells him that he really needs to pass this class because he can't afford to stay in college any longer, and pleads for a good performance review. What should Josh do?

Decision

Josh must decide whether or not to disclose to the professor that Matt did not even come close to doing his share of the team project, fully aware that a poor or failing performance evaluation may prevent Matt from graduating. Josh is an honest person, and he has a hard time imagining that he

could tell the professor that Matt did a good job when that is far from the truth. However, Josh is also a just person, and he feels indebted toward Matt, who has done him a lot of favors over the past four years—particularly those free rides to and from his hometown. Josh also feels compassion toward Matt, who lost his father. It's bad enough to lose a parent, but because of the sudden nature of his father's death, Matt didn't even have the chance to say goodbye to him. As he ponders his dilemma, Josh begins to realize that he finds himself in this difficult spot because at several points in the past he didn't step up and do the right thing. He took advantage of Matt's generosity (and gave in to his own greedy impulses) by taking all those free rides to and from his hometown. If he had paid his share of the gas money, he wouldn't be feeling so obligated toward Matt. Josh also knows he wasn't a very good friend when he failed to talk with Matt about how he was feeling about his father's death and how that was affecting his performance on the senior project. Matt's lack of attention to his schoolwork was definitely out of character, a sign that he was suffering a lot. Josh now understands that he and the other teammates should have had a conversation with the professor in charge of the senior projects when it first became apparent that Matt was not participating fully as a teammate. An early intervention could have resulted in a completely different outcome. After reflecting on what he should do, Josh concludes he must be truthful with the professor. However, he will not simply tell the professor that Matt's performance was poor. Josh decides he will also take responsibility for his role in the fiasco by providing a full account to the professor of how his own failure to respond to the situation earlier in the year contributed to the unsatisfactory outcome.

NOTE: Click the "Next" button to proceed.

3.1 || Network Communication

Overview

- Introduction
- Email and spam
- Fighting spam
- World Wide Web
- Ethical perspectives on pornography
- Censorship
- Freedom of expression
- Children and the Web
- Breaking trust on the Internet
- Internet addiction

Introduction

- Networking increases the computer's utility
 - In addition to Word processing, Excel, ...etc, you can share printers, extra storage, exchange data, e-mail.
- Internet connects millions of computers
 - Powerful computational resource
 - E-mail, surfing www, promoting your company.
 - Even more powerful communication medium
- Network utility grows as the number of users squared
 - 10 users --> 90 sender-receiver combinations
 - 100 users --> 9900 sender-receiver combinations
- As people grows
 - The network may suffer overload
 - people may act irresponsibly

How Email Works

- Email: Messages embedded in files transferred between computers

- Email address: Uniquely identifies cyberspace mailbox (2-parts User....@ Domain....)
- Messages broken into packets
- Routers transfer packets from the sender's mail server to the receiver's mail server

Figure below shows how email really works.

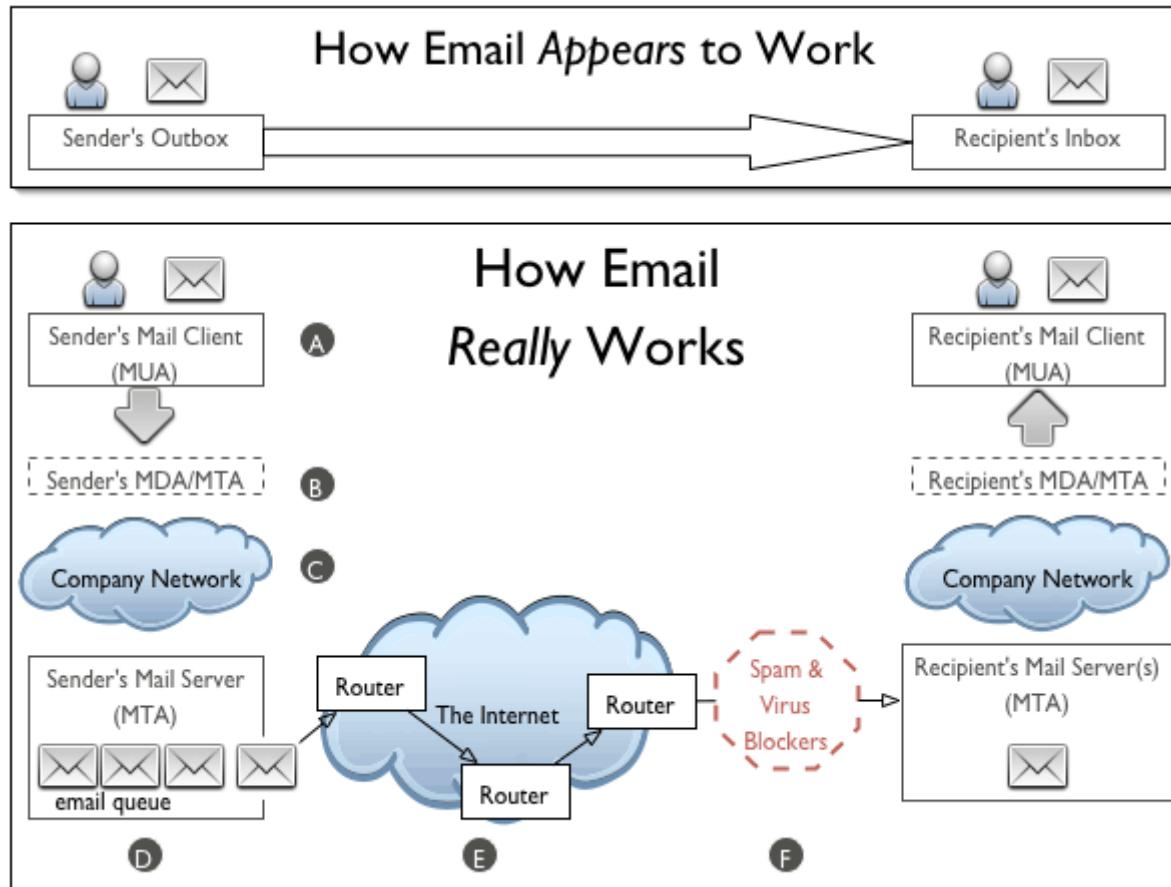


Image Reference: https://www.oasis-open.org/khelp/kmlm/user_help/html/how_email_works.html ↗ (https://www.oasis-open.org/khelp/kmlm/user_help/html/how_email_works.html)

From the user standpoint, email seems so simple. You set the email address of the person to whom you want to send the email, compose your message and click 'Send'. All done.

In reality, sending your message off into the network cloud is a bit like sending Little Red Riding Hood into the deep dark woods. You never know what might happen.

Network Cloud - the set of all mail servers and connectors within a company or organization.

The Spam Epidemic

- Spam: Unsolicited, bulk email
- Amount of email that is spam has increased
 - 8% in 2001
 - 40% in 2003
 - 75% in 2007
 - 90% in 2009
- Spam is effective (Cheap way for Ads. \$500 - \$2000)

- A company hires an internet marketing firm to send thousands of emails
- More than 100 times cheaper than “Junk mail”
- Profitable even if only 1 in 100,000 buys the product
- How firms get email addresses
 - Opt-in lists
 - Dictionary attacks (made-up email addresses to ISP that bounce back)
- Spammers seek anonymity
 - Change email and IP addresses to disguise sending machine
 - Hijack another insecure system as a spam launchpad
- Spam blockers
 - Attempt to screen out spam (spam filters) by blocking suspicious subject lines.
 - Have led to more picture-based spam

Ethical Evaluations of Spamming

- Kantian evaluation (receiving ads via cell phone costs money. Using people as a means for an end ---- profit)
- Act utilitarian evaluation (1 from 100,000 will buy)
- Rule utilitarian evaluation (if millions of people are interested to respond to spam there will be no way to accommodate them). In practice, tiny users respond and many others are thinking of dropping their accounts)
- Social contract theory evaluation

(you have the right to free speech doesn't mean that all will listen – spammers are not introducing themselves.

- From all these perspectives, it is wrong to send spam

Fighting Spam: Real-Time Blackhole List

- Trend Micro contacts marketers who violate standards for bulk email
- (a DB of IP addresses that make spam. Trend Micro sells this DB to organizations)
- Unsecured mail servers that have been hijacked may be regarded as spammers and they will be blocked even if they are not spammers)

Ethical Evaluations of Publishing Blacklist

- **Social contract theory evaluation**
 - Senders and receivers do not derive equal benefit from emails.
- **Utilitarian evaluation**

- Blacklisting will affect innocent users, receivers, and marketing firms, this will reduce the benefits of internet utility as a whole.

- **Kantian evaluation**

- Innocent users are used as a means for an end (eliminating spams)

Proposed Solutions to Spam Epidemic

- Require an explicit opt-in of subscribers
- Require labeling of email advertising (all commercial emails must write ADS on the subject line)
- Add a cost to every email that is sent for ads. A micropayment system is proposed
- Ban unsolicited email by-laws (laws to prohibit spam as those laws made to junk faxes)

The emergence of “Spam”

- “Spam” is an unsolicited, bulk instant message.
 - Ex: IM that has a link to a porn site.
- People combat spam by accepting messages only from friends or buddies

Need for Socio-Technical Solutions

- New technologies sometimes cause new social situations to emerge
 - Calculators feminization of bookkeeping
 - Telephones blurred work/home boundaries
- Spam an example of this phenomenon
 - Email messages practically free
 - Profits increase with the number of messages sent
 - Strong motivation to send more messages
- Internet design allows unfair, one-way communications – You might receive e-mail But you can't reply

NOTE: Click "**Next**" to proceed.

3.1.1 || Attributes of the Web

Attributes of the Web

Attributes of the Web

- It is decentralized
 - No need for central authority
 - BUT it becomes difficult to control the Web
 - Every Web object has a unique address
 - URL. Every Web page has a unique URL
 - It is based on the Internet
 - It needs browsers, media for storage, SW for retrieving data, ftp, OSs...etc.

How We Use the Web

- Shopping
- Contributing content (wikis, blogs)
- A **wiki** is a website that allows the easy creation and editing of any number of interlinked web pages via a web browser using a simplified markup language. Collaborative site – many authors
- Blogs are usually maintained by an individual with regular entries of commentary. Personal site (Ex: online journal)
 - Promoting business
 - Learning
 - Exploring our roots
 - Entering virtual worlds
 - Paying taxes
 - Gambling
 - Lots more!

Too Much Control or Too Little?

- Not everyone in the world has Internet access
- Saudi Arabia: centralized control center

- People's Republic of China: ISPs sign "self-discipline" agreement
- Germany: Forbids access to neo-Nazi sites
- United States: Repeated efforts to limit access of minors to pornography
 - like child pornography

Pornography Is Immoral

- Kant
 - Loved person an object of sexual appetite
 - Sexual desire focuses on the body, not the complete person
 - All sexual gratification outside marriage wrong
- Utilitarianism
 - Pornography reduces the dignity of human life
 - Pornography increases crimes such as rape
 - Pornography reduces sympathy for rape victims
 - Pornography is like pollution
 - The pornography industry diverts resources from more socially redeeming activities
- Utilitarianism
 - Those who produce pornography make money
 - Consumers of pornography derive physical pleasure
 - Pornography is a harmless outlet for exploring sexual fantasies

Commentary

- Performing utilitarian calculus on pornography is difficult
 - How to quantify harms/benefits, such as harm done to people who find pornography offensive?
 - How to deal with contradictory "facts" by "experts?"
- Harmless outlet AGAINST more likely to commit rape

NOTE: Click "**Next**" to proceed.

3.1.2 || Censorship

Censorship

Direct Censorship

- Government monopolization
 - TV and radio stations
 - Prepublication review
- To monitor government secrets (Nuclear weapons)
- Licensing and registration
 - To control media with limited bandwidth. (Frequencies)

Self-censorship

- The most common form of censorship
- Group decides for itself not to publish
- Reasons
 - Avoid subsequent persecution (CNN in Iraq)
 - Maintain good relations with government officials (if they offend government they lose their official sources of information)
 - Rating systems
 - Movies, TVs, CDs, video games
 - Not** the Web (some may have warned – and ask for agreeing to enter a site)

Challenges Posed by the Internet

- Many-to-many communication
 - It is easy to close a radio station BUT difficult to do so for a Web page (millions can post pages)
 - Dynamic connections
- Millions of PCs are connected to the internet yearly
 - Huge numbers of Web sites

–No way to monitor them all.

- Extends beyond national borders, laws
- Can't determine the age of users

– an adult Web site can not confirm the age of a user

Ethical Perspectives on Censorship

- Kant opposed censorship

–Enlightenment thinker

–“Have the courage to use your own reason”

- Think for yourself
- Mill opposed censorship

–No one is infallible

–Any opinion (not the majority opinion) may contain a kernel of truth (a part of the whole truth)

Mill's Principle of Harm

“The only ground on which intervention is justified is to prevent harm to others; the individual’s own good is not a sufficient condition.” When an individual’s act harms others the government must intervene.

Freedom of Expression: History

- 18th century

–England and the colonies: No prior restraints on publication

–People could be punished for sedition or libel

- American states adopted bills of rights including freedom of expression
- Freedom of expression in 1st amendment to U.S. Constitution addressed this issue.

Freedom of Expression - Not an Absolute Right

- 1st Amendment covers political and nonpolitical speech
- The right to freedom of expression must be balanced against the public good
- Various restrictions on freedom of expression exist

– prohibition of cigarette advertising on TV

Children and the Web: Web Filters

- Web filter: software that prevents display of certain Web pages
 - May be installed on an individual PC
 - ISP may provide service for customers
 - Methodologies
 - Maintain “black list” of objectionable sites
 - Before downloading a page, examine content for objectionable words/phrases
 - Child Internet Protection Acts started to arise

Breaking trust on the Internet: Identity Theft

- **Identity theft:** when a person uses another person’s electronic identity
- More than 1 million Americans were victims of identity theft in 2008 due to their online activities
- **Phishing:** use of email or Web pages to attempt to deceive people into revealing personal information

Chat Room Predators

- Chat room: supports real-time discussions among many people connected to the network
- Instant messaging (IM) and chat rooms (which is similar to IM) replacing telephone for many people
- Some pedophiles meeting children through chat rooms
- Police countering with “sting” operations
- Policemen enter chat rooms to lure pedophiles.

False Information

- Quality of Web-based information varies widely
 - Moon landings
 - Holocaust
 - Google attempts to reward quality
 - Keeps a DB of 8 million web pages.
 - Ranking Web pages use a “voting” algorithm
 - If many links point to a page, Google search engine ranks that page higher

Is Internet Addiction Real?

- Some liken compulsive computer use to pathological gambling
- Traditional definition of addiction:
 - Compulsive use of harmful substance or drug
 - Knowledge of its long-term harm (misuse)
 - Kimberly Young created test for Internet addiction
 - (8 questions on gambling on the Net)
 - (5 “yes” ----- means addiction)
 - Her test is controversial

Contributing Factors to Computer Addiction

- Social factors
 - Peer groups
 - Situational factors
 - Stress
 - Lack of social support and intimacy
 - Limited opportunities for productive activity
- Individual factors
 - Tendency to pursue activities to excess
 - Lack of achievement
 - Fear of failure
 - Feeling of alienation

3.2 || Intellectual Property

Overview

- Introduction
- Intellectual property rights
- Protecting intellectual property
- Fair use
- Peer-to-peer networks
- Protections for software
- Open-source software
- The legitimacy of intellectual property protection for software

Introduction

- Digital music storage + Internet ® crisis
- Value of intellectual properties much greater than the value of media
 - Creating the first copy is costly
 - Duplicates cost almost nothing
- Illegal copying pervasive
 - The Internet allows copies to spread quickly and widely
- In light of information technology, how should we treat intellectual property?

What Is Intellectual Property?

- Intellectual property: any unique product of the human intellect that has commercial value
 - Books, songs, movies
 - Paintings, drawings
 - Inventions, chemical formulas, computer programs
- Intellectual property (idea) ≠ physical manifestation (paper)

Image below shows the different categories of Intellectual Property.

Managing your Intellectual Property as a Business Asset in China | Your IP Insider

Image Reference: [Intellectual Property](https://www.google.com/url?sa=i&url=http%3A%2F%2Fwww.youripinsider.eu%2Fmanaging-intellectual-property-business-asset-china%2F&psig=AOvVaw0oBh38Mxz5ilfGryN_5n7&ust=1599467122336000&source=images&cd=vfe&ved=2ahUKEwjhi8O-jdTrAhVCgMYKHZ72BtYQjRx6BAgAEAc) ↗ (https://www.google.com/url?sa=i&url=http%3A%2F%2Fwww.youripinsider.eu%2Fmanaging-intellectual-property-business-asset-china%2F&psig=AOvVaw0oBh38Mxz5ilfGryN_5n7&ust=1599467122336000&source=images&cd=vfe&ved=2ahUKEwjhi8O-jdTrAhVCgMYKHZ72BtYQjRx6BAgAEAc)

Property Rights

- Locke: *The Second Treatise of Government*
- People have a right...
 - to property in their own person
 - to their own labor
 - to things which they remove from Nature through their labor (ex: cutting wood-logs-, gaining a land)
 - As long as...
 - no person claims more property than he or she can use
 - after someone removes something from the common state, there is plenty left over

Analogy Is Imperfect

- If two people write the same play, both cannot own it ¾ every intellectual property is one-of-a-kind
- If one person “takes” another’s playing, both have it ¾ copying an intellectual property is different from stealing a physical object

Benefits of Intellectual Property Protection

- Some people are altruistic; some are not
 - People can benefit from having ownership of their ideas, and thus can improve the quality of life for others
 - The allure of wealth can be an incentive for speculative work.
 - Giving creators rights to their inventions stimulates creativity

Limits to Intellectual Property Protection

- Society benefits most when inventions in the public domain
- Congress has struck a compromise by giving authors and inventors rights for a limited time.

–Authors of the U.S. Constitution recognized the benefits to *limited* intellectual property protection. (Ex: exclusive rights for novels for a limited period of time)

Protecting Intellectual Property

- Trade secrets
- Trademarks and service marks
- Patents
- Copyrights

Trade Secret

- Confidential piece of intellectual property that gives the company a competitive advantage
- Employees are asked to make a confidentiality agreement
- Examples:
 - Formulas, customers' lists, strategic plans, proprietary design
 - Never expires
 - Not appropriate for all intellectual properties (movies- they should be viewed and not be kept in secret??)
 - Reverse engineering allowed (buying a can of Coca-Cola and trying to figure out its formula is legal)
 - May be compromised when employees leave the firm.

Trademark and Service Mark

- Trademark: Identifies goods

–given by a government to a distinctive product

–Byword, symbol, picture, color, smell, sound

- Servicemark: Identifies services
- The company can establish a “brand name”
- Does not expire
- If a brand name becomes a common noun, the trademark may be lost (Aspirin)
- Companies advertise to protect their trademarks, using adjectives, not verbs, or nouns.
- Companies also protect trademarks by contacting those who misuse them (photoshop must not be used as a verb or noun from misusers)

Patent

- A public (not secret) document that provides a detailed description of the invention

- Provides owner with the exclusive right to the invention
- The owner can prevent others from making, using, or selling the invention for 20 years
- After that, anyone can make use of the idea
- Example: Polaroid vs Kodak- instant photography

Copyright

- Provides owner of an original work five rights

–Reproduction

–Distribution (copies of the work to public)

–Public display (copies of the work in public)

–Public performance

–Production of derivative works

- Copyright-related industries represent 5% of U.S. gross domestic product (> \$500 billion/yr)
- Examples: movie, music, SW, book industry.
- Copyright protection has expanded greatly since 1790

Fair Use Concept

- Sometimes legal to reproduce a copyrighted work without permission

–Citing short excerpts for teaching, research, criticism, commentary, news reporting

- Courts consider four factors

–Purpose and character of the use

- (Educational is permissible, not commercial)

–Nature of work

- Fiction vs nonfiction (facts) and published preferred over non-published

–Amount of work being copied

- Brief excerpts, not the entire work

–Affect on market for work

- The use of out of print is permissible

NOTE: Click "**Next**" to proceed.

3.2.1 || Digital Rights Management

Digital Rights Management

Digital Recording Technology

- Copying from vinyl records to cassette tapes introduced hiss and distortions (bad quality)
- Introduction of the compact disc (CD) a boon for the music industry
 - Cheaper to produce than vinyl records
 - Higher quality
 - A higher price (companies charge more) → higher profits
 - BUT it's possible to make a perfect copy of a CD

Digital Rights Management

- Actions owners of digital intellectual property take to protect their rights
- Approaches
 - Encrypt digital content
 - Digital marking so devices can recognize the content as copy-protected

Criticisms of Digital Rights Management

- Any technological “fix” is bound to fail
- DRM undermines fair use (no private copy)
- DRM could reduce competition (never expire)
- Some schemes make anonymous access impossible
- Media Player tracks the contents the user's view

Peer-to-Peer Networks

- Peer-to-peer network
 - Transient network
 - Connects computers running same networking program
 - Computers can access files stored on each other's hard drives

- How P2P networks facilitate data exchange
 - Give each user access to data stored in many other computers
 - Support simultaneous file transfers among arbitrary pairs of computers
 - Allow users to identify systems with faster file exchange speeds
- Ex: (PCs that have faster transfer rate because they have ADSL speed)

Napster

- The peer-to-peer music exchange network
- Began operation in 1999
- Sued by RIAA (Recording Industry Association of America) for copyright violations
- Courts ruled in favor of RIAA
- Went off-line in July 2001
- Re-emerged in 2003 as a subscription music service

BitTorrent

- Broadband connections: download much faster than upload
- BitTorrent speeds downloading
 - Files broken into pieces
 - Different pieces downloaded from different computers
 - Used for downloading large files
 - Computer programs
 - Television shows
 - Movies

Universities Caught in Middle

- Universities hotbed for file sharing
 - High-speed Internet access
 - High-capacity file servers
 - In 2003 RIAA sued four students (for distributing copyrighted music) for about \$100 billion (settled for \$50,000)
 - Different university responses
- Taking PCs of students

- Banning file-sharing
- Signing agreements with legal file-sharing services like Napster (for fees)

Legal Music Services on the Internet

- Subscription services for legal downloading (like Napster)
- Some based on monthly fee; some free
- Consumers pay for each download
- Apple's iTunes Music Store leading service (just pay 99 cents per song)

NOTE: Click "**Next**" to proceed.

3.2.2 || Software Copyright

Software Copyright

Protections for Software – Software Copyrights

- Copyright protection began 1964
- What gets copyrighted?

–Expression of idea, not idea itself

- Ex: Implementation of RDBMS NOT the concept of it (App. Not Idea of DB)

–Object program (.exe), not source program

- Because source codes are secrets
- Companies deliver .exe
- Companies treat source code as a trade secret

Violations of Software Copyrights

- Copying a program to give or sell to someone else
- Preloading a program onto the hard disk of a computer being sold
- Distributing a program over the Internet

Safe Software Development

- Reverse engineering okay
- Companies must protect against unconscious copying

–Making the same duplicate of a program because programmers move from firm to another

- Solution: “clean room” software development strategy

–Team 1 analyzes the competitor’s program and writes specifications.

–Team 2 uses specification to develop software

Open-Source Software: Consequences of Proprietary Software

- Increasingly harsh measures being taken to enforce copyrights (infringe our liberties)

–This act was created in an era with difficulties to make copies. This is not the case NOW.

- Copyrights are not serving their purpose of promoting progress.

–They make authors wealthy

- It is wrong to allow someone to “own” a piece of intellectual property

–Cooperation is more important than copyright,

Open Source Definition

Licenses have the following characteristics:

- No restrictions preventing others from selling or giving away software
- Source code included in the distribution
- No restrictions preventing others from modifying source code
- No restrictions regarding how people can use the software. They can exchange or sell.
- The same rights apply to everyone receiving redistributions of the software (copyleft)
- NOTE: Nothing states that Open Source SW must be given FREE.

Beneficial Consequences of Open-Source Software

- Gives everyone opportunity to improve program
- New versions of programs appear more frequently
- Eliminates tension between obeying law and helping others
- Programs belong to entire community
- Shifts focus from manufacturing to service

–Buying Open Source SW with easy installation steps

–Providing great manuals

–Providing support after-sales

Examples of Open-Source Software

- BIND – give DNS for the entire Internet
- Apache – runs half of the Web servers
- Sendmail – moving e-mail via the internet
- Perl, Python, Ruby, TCL/TK, PHP, Zope
- GNU (General Public License) compilers for C, C++, Objective-C, Fortran, Java, and Ada

Impact of Open-Source Software

- Linux putting pressure on companies selling proprietary versions of Unix
- Linux putting pressure on Microsoft and Apple desktops

- The cost for these OSs goes down

Critique of the Open-Source Software Movement

- Without attracting a critical mass of developers, open-source SW quality can be poor
- Without an “owner,” incompatible versions may arise
 - Independent groups of users make enhancements, so many versions will appear – no compatibility
 - Relatively weak graphical user interface
 - The poor mechanism for stimulating innovation
 - No companies will spend billions on new programs

The legitimacy of Intellectual Property Protection for Software

- Software licenses typically prevent you from making copies of the software to sell or give away
- Software licenses are legal agreements
- Here we are not discussing the morality of breaking the law
- We are discussing whether society *should* give intellectual property protection to software
 - utilitarian analysis

Utilitarian Analysis

- Argument against copying
 - Copying software reduces software purchases...
 - Leading to less income for software makers...
 - Leading to lower production of new software...
 - Leading to fewer benefits to society
 - Each of these claims can be debated
 - Not all who get free copies can afford to buy software
 - The open-source movement demonstrates many people are willing to donate their software-writing skills
 - The hardware industry wants to stimulate the software industry
 - Difficult to quantify how much society would be harmed if certain software packages not released
 - It is not a matter of how many SW, but what they can be used for

NOTE: Click "**Next**" to proceed in Summary.

4.1 || Information Privacy (Data Privacy)

Information Privacy

What is Data Privacy?

The right of an individual not to have private information about himself disclosed, and to live freely from surveillance and intrusion.

-<https://www.privacy.gov.ph/>

Why Data Privacy is Important?

When data that should be kept private gets in the wrong hands, bad things can happen.

- A data breach at a government agency can, for example, put top-secret information in the hands of an enemy state.
- A breach at a corporation can put proprietary data in the hands of a competitor.
- A breach at a school could put students' Personal Identifiable Information (PII) in the hands of criminals who could commit identity theft.
- A breach at a hospital or doctor's office can put Personal Health Information (PHI) in the hands of those who might misuse it.

REPUBLIC ACT 10173

DATA PRIVACY ACT OF 2012 (DPA)

"An act protecting individual personal information in information and communications systems in the government and the private sector, creating for this purpose a National Privacy Commission, and for other purposes"

Who must comply?

Companies with 250 employees or 1000 data subjects.

The processing of all types of personal information and to any natural and juridical persons involved in personal information processing shall comply to the law

-page 24 of the Data Privacy and Cybercrime Prevention in the Philippine Digital Age

What is Data Subject?

Data subject refers to an individual whose personal information is processed.

It is the customer whom we serviced.

What to protect?

Offline Identity - Identification cards we use on a day-to-day basis to authenticate identity in the physical world.

Online identity is a social identity that an internet user establishes in online communities and websites.

Personal Identifiable Information

Personal Identifiable Information refers to any information whether recorded in a material form or not, from which the identity of an individual is apparent or can be reasonably and directly ascertained by the entity holding the information when put together with other information would directly and certainly identify an individual.

-Page 15 of the Data Privacy and Cybercrime Prevention in the Philippine Digital Age

Personal Information

Some personal information that is protected:

- 1.Full Name
- 2.Present Address
- 3.Permanent Address
- 4.Home Number
- 5.Cellphone Number
- 6.Email Address
- 7.Mother's Maiden Name
- 8.Job Position

Sensitive Personal Information

Sensitive personal information refers to personal information:

- (1) About an individual's race, ethnic origin, marital status, age, color, and religious, philosophical or political affiliations;
- (2) About an individual's health, education, genetic or sexual life of a person, or to any proceeding for any offense committed or alleged to have been committed by such person, the disposal of such proceedings, or the sentence of any court in such proceedings;

Who Controls the data?

1. Personal Information **Controller (PIC)** - refers to a person or organization who controls the collection, holding, processing or use of personal information, including a person or organization who instructs another person or organization to collect, hold, process, use, transfer or disclose personal information on his or her behalf.
2. Personal Information **Processor (PIP)**- refers to any natural or juridical person or any other body to whom a PIC may outsource or instruct the processing of personal data pertaining to a data subject.

What is Consent?

Consent means giving data subjects genuine choice and control over how a Personal Information Controller (PIC) uses their data. Data subjects may be able to refuse consent and may be able to withdraw consent easily at any time.

To be able to understand more , please watch this video:

The video presentation below discuss more about the Data Privacy Rights



Likewise, the video presentation below discuss more about the Data Protection

Data Protection - Link below to our UPDATED video with GD...



NOTE: Click the "Next" button to proceed.

4.1.1 || Know Your Rights

Know your Rights

The right to be informed

Under R.A. 10173, your personal data is treated almost literally in the same way as your own personal property. Thus, it should never be collected, processed, and stored by any organization without your explicit consent, unless otherwise provided by law. Information controllers usually solicit your consent through a consent form. Aside from protecting you against unfair means of personal data collection, this right also requires personal information controllers (PICs) to notify you if your data have been compromised, in a timely manner.

As a data subject, you have the right to be informed that your personal data will be, are being, or were, collected and processed.

The Right to be Informed is the most basic right as it empowers you as a data subject to consider other actions to protect your data privacy and assert your other privacy rights.

The right to access

This is your right to find out whether an organization holds any personal data about you and if so, gain “reasonable access” to them. Through this right, you may also ask them to provide you with a written description of the kind of information they have about you as well as their purpose/s for holding them.

Under the Data Privacy Act of 2012, you have a right to obtain from an organization a copy of any information relating to you that they have on their computer database and/or manual filing system. It should be provided in an easy-to-access format, accompanied with a full explanation executed in plain language.

You may demand to access the following:

- The contents of your personal data that were processed.
- The sources from which they were obtained.
- Names and addresses of the recipients of your data.
- Manner by which they were processed.
- Reasons for disclosure to recipients, if there were any.
- Information on automated systems where your data is or may be available, and how it may affect you.

- Date when your data was last accessed and modified
- The identity and address of the personal information controller.

The right to rectify

You have the right to dispute and have corrected any inaccuracy or error in the data a personal information controller (PIC) holds about you. The PIC should act on it immediately and accordingly unless the request is vexatious or unreasonable. Once corrected, the PIC should ensure that your access and receipt of both new and retracted information. PICs should also furnish third parties with said information, should you request it.

The right to damages

You may claim compensation if you suffered damages due to inaccurate, incomplete, outdated, false, unlawfully obtained, or unauthorized use of personal data, considering any violation of your rights and freedoms as the data subject.

The right to file a complaint with the National Privacy Commission

If you feel that your personal information has been misused, maliciously disclosed, or improperly disposed, or that any of your data privacy rights have been violated, you have a right to file a complaint with the NPC.

For more information, you may visit this site: <https://www.privacy.gov.ph/know-your-rights/> (https://www.privacy.gov.ph/know-your-rights/)

4.2 || Computer and Network Security

Introduction

Do you ever go to a coffee shop and use its open wireless network to surf the Web? Did you know freely available software gives any nearby computer user the ability to break into the accounts of people accessing Web sites through password-free wireless networks?

Watch the video below:



In the movie *Live Free or Die Hard*, a terrorist organization hacks into a variety of computer and communication systems to seize control of traffic lights, natural gas pipelines, and electrical power grids. Are such episodes purely the stuff of Hollywood fiction, or could they really happen? Millions of people use computers and the Internet to send and receive an email, access bank accounts, purchase goods and services, and keep track of personal information, making the security of these systems an important issue. Malicious software can enter computers in a variety of ways. Once active, these programs can steal personal information, destroy files, disrupt

industrial processes, and launch attacks on financial systems, supporting criminal enterprises and politically motivated attacks on corporations and governments around the world.

This lesson focuses on threats to computer and network security. We begin our survey with examples of individuals using cunning or skill to gain unauthorized access into computer systems.

NOTE: Click "**Next**" to proceed.

4.2.1 || Hackers (Past and Present)

Hackers in the Past

In its original meaning, a **hacker** was an explorer, a risk-taker, someone who was trying to make a system do something it had never done before.

Hackers in this sense of the word abounded at MIT's Tech Model Railroad Club in the 1950s and 1960s. The club constructed and continuously improved an enormous HO-scale model train layout. Members of the Signals and Power Subcommittee built an elaborate electronic switching system to control the movement of the trains.

To them, a “hack” was a newly constructed piece of equipment that not only served a useful purpose but also demonstrated its creator’s technical virtuosity.

Calling someone a hacker was a sign of respect; hackers wore the label with pride.

In 1959, after taking a newly created course in computer programming, some of the hackers shifted their attention from model trains to electronic computers.

The term “hacker” came to mean a “person who delights in having an intimate understanding of the internal workings of a system, computers and networks in particular”.

In the 1983 movie *WarGames*, a teenager breaks into a military computer and nearly causes a nuclear Armageddon. After seeing the movie, a lot of teenagers were excited at the thought that they could prowl cyberspace with a home computer and a modem. A few of them became highly proficient at breaking into government and corporate computer networks. These actions helped change the everyday meaning of the word “hacker.”

Hackers Today

Today hackers are people who gain unauthorized access to computers and computer networks.

Typically, you need a login name and password to access a computer system. Sometimes a hacker can guess a valid login name/password combination, particularly when system administrators allow users to choose short passwords or passwords that appear in a dictionary.

There are three other low-tech techniques for obtaining login names and passwords are eavesdropping, dumpster diving, and social engineering.

1. Eavesdropping, such as simply looking over the shoulder of a legitimate computer user to learn his login name and password.
2. **Dumpster diving** means looking through garbage for interesting bits of information. Companies typically do not put a fence around their dumpsters. In midnight rummaging sessions, hackers have found user manuals, phone numbers, login names, and passwords.
3. **Social engineering** refers to the manipulation of a person inside the organization to gain access to confidential information. Social engineering is easier in large organizations where people do not know each other very well. For example, a hacker may identify a system administrator and call that person, pretending to be the supervisor of his supervisor and demanding to know why he can't access a particular machine. In this situation, a cowed system administrator, eager to please his boss's boss, may be talked into revealing or resetting a password.

Penalties for Hacking

PHILIPPINES REPUBLIC ACT NO.8792

AN ACT PROVIDING FOR THE RECOGNITION AND USE OF ELECTRONIC COMMERCIAL AND NON-COMMERCIAL TRANSACTIONS, PENALTIES FOR UNLAWFUL USE THEREOF, AND OTHER PURPOSES

Sec. 33. Penalties. - The following Acts shall be penalized by fine and/or imprisonment, as follows:

a) **Hacking or cracking** which refers to unauthorized access into or interference in a computer system/server or information and communication system; or any access in order to corrupt, alter, steal or destroy using a computer or other similar information and communication devices, without the knowledge and consent of the owner of the computer or information and communications system, including the introduction of computer viruses and the like, resulting in the corruption, destruction, alteration, theft or loss of electronic data messages or electronic document shall be punished by a minimum fine of one hundred thousand pesos (P100,000.00) and a maximum commensurate to the damage incurred and a mandatory imprisonment of six (6) months to three (3) years.

NOTE: Click "**Next**" to proceed.

4.2.2 || Malware

Malware

Malware, or malicious software, is any program or file that is harmful to a computer user.

If you are lucky, these programs will do nothing other than consume a little CPU time and some disk space. If you are not so lucky, they may destroy valuable data

stored in your computer's file system. An invading program may even allow outsiders to seize control of your computer. Once this happens, they may use your computer as a depository for stolen credit card information, a Web server dishing out pornographic images, or a launch pad for spam or a denial-of-service attack on a corporate or government server.

Types of **malware** can include

1. computer viruses,
2. worms,
3. Trojan horses and
4. spyware.

Malware: Difference Between Computer Viruses, Worms an...



Viruses

A **virus** is a piece of self-replicating code embedded within another program called the **host**.

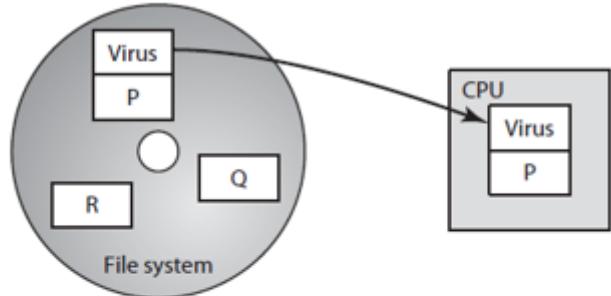
One way a computer virus can replicate.

(a) A computer user executes program P, which is infected with a virus.

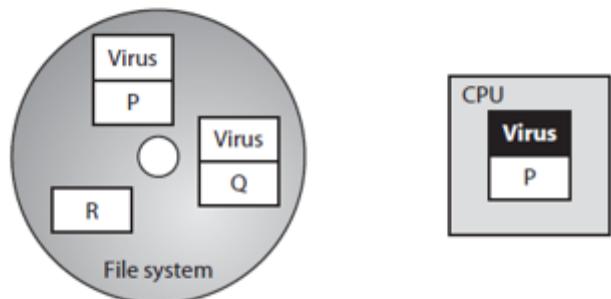
(b) The virus code begins to execute. It finds another executable program Q and creates a new version of Q infected with the virus.

(c) The virus passes control to program P. The user, who expected program P to execute, suspects nothing.

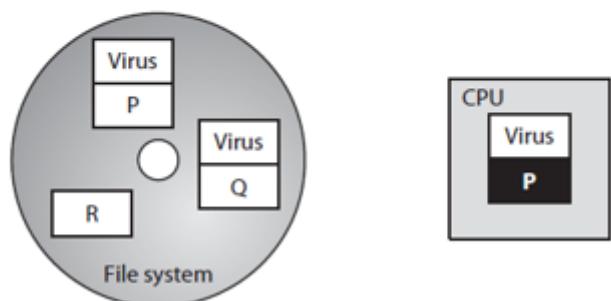
Because a virus is attached to a host program, you may find viruses anywhere you can find program files: hard disks, thumb drives, CD-ROMs, email attachments, and so on. Viruses can be spread from machine to machine via thumb drives or CDs. They may also be passed when a person downloads a file from the Internet. Sometimes viruses are attached to free computer games that people download and install on their computers.



(a)



(b)

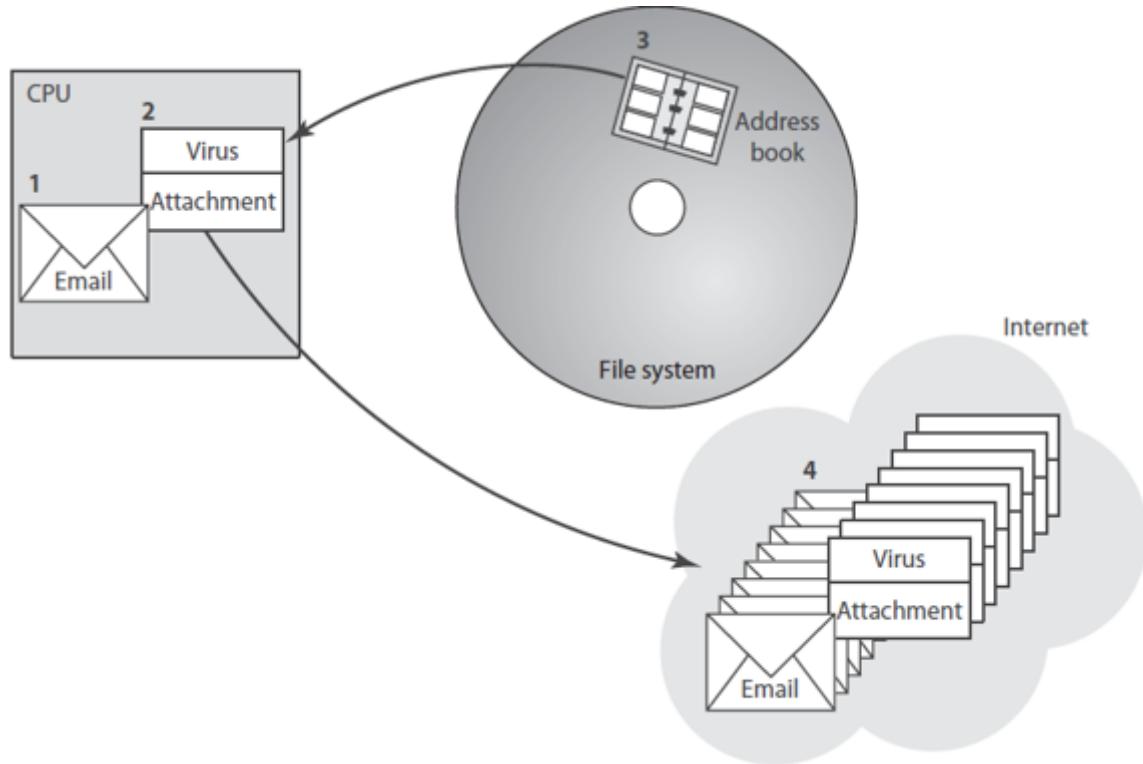


(c)

How an Email Virus Spreads

1. A computer user reads an email with an attachment
2. The user opens the attachment, which contains a virus
3. The virus reads the user's email address book
4. The virus sends emails with virus-containing attachments

To protect our computer system, we can install antivirus software. Commercial antivirus software packages allow computer users to detect and destroy viruses lurking on their computers. To be most effective, users must keep them up-to-date by downloading patterns corresponding to the latest viruses from the vendor's Web site.



Internet Worm

A **worm** is a self-contained program that spreads through a computer network by exploiting security holes in the computers connected to the network.

The technical term “worm” comes from *The Shockwave Rider*, a 1975 science fiction novel written by John Brunner.

The World's First Cyber Crime: The Morris Worm [KERNEL P...



The most famous worm of all time was also the first one to get the attention of the mainstream media, which is why it is popularly known as the Internet worm, even though many other worms have been created that propagate through the Internet. The primary source for this narrative is the

excellent biography of Robert Morris in *Cyberpunk: Outlaws and Hackers on the Computer Frontier*, written by Katie Hafner and John Markoff.

Sasser

The Sasser worm, launched in April 2004, exploited a previously identified security weakness with PCs running the Windows operating system.

Computers with up-to-date software were safe from the worm, but it infected about 18 million computers worldwide nonetheless.

The effects of the worm were non-threatening; infected computers simply shut themselves down shortly after booting.

Still, the worm made millions of computers unusable and disrupted operations at Delta Airlines, the European Commission, Australian railroads, and the British coast guard.

Instant Messaging Worms

There are two early worms to strike instant messaging systems were Choke and Hello, which appeared in 2001.

Worms were less devastating back then because only about 141 million people used instant messaging. Today more than 800 million people rely on instant messaging, so the impact of worms can be much greater.

The appearance of the Kelvir worm in 2005 forced the Reuters news agency to remove 60,000 subscribers from its Microsoft-based instant messaging service for 20 hours.

In 2010 a variant of the Palevo instant messaging worm rapidly spread through Romania, Mongolia, and Indonesia.

Conficker

The Conficker (or Downadup) worm, which appeared on Windows computers in November 2008, is notable because computer security experts have found it particularly difficult to remove.

The worm is able to spread in several ways.

1. The original variant of the worm spread to computers that were not up-to-date with the latest security patches from Microsoft.
2. The second version of the worm, which appeared about a month later, had two new features that accelerated its spread: the ability to invade computers with weak password protection and the ability to propagate through

USB memory sticks and shared files on local area networks.

Early in 2009, between 8 and 15 million computers were infected with Conficker, including portions of military networks in France, the United Kingdom, and Germany.

According to Rodney Joffe of the Conficker Working Group, “It’s using the best current practices and state of the art to communicate and to protect itself”. Even though millions of copies of this worm are circulating, it does not appear to have done great harm. Security experts remain baffled as to the goals of those who created it.

Cross-site scripting

Cross-site scripting is another way in which malware may be downloaded without a user’s knowledge. Web sites that allow users to read what other users have posted are vulnerable to this security problem. The attacker injects a client-side script into a Web site. When an innocent user visits the site sometime later, the user’s browser executes the script, which may steal cookies, track the user’s activity, or perform another malicious action.

XSS - Cross-Site Scripting Explained

XSS - Cross Site Scripting Explained



Drive-By Downloads

Many malware creators have hacked into legitimate Web sites and installed software booby traps. In some cases, simply visiting a compromised Web site can result in the unintentional downloading of software, called a **drive-by download**.

A drive-by download refers to the unintentional download of malicious code to your computer or mobile device that leaves you open to a cyberattack. You don't have to click on anything, press

download, or open a malicious email attachment to become infected. A drive-by download can take advantage of an app, operating system, or web browser that contains security flaws due to unsuccessful updates or lack of updates. Unlike many other types of cyberattack, a drive-by doesn't rely on the user to do anything to actively enable the attack.

One example of drive-by download is when a Web surfer encounters a pop-up window asking permission to download software. The user approves the download, thinking the code is necessary to view the content on the Web site, but in actuality the download contains malware.

The drive-by download problem is growing. The Google Anti-Malware Team has discovered more than three million URLs that initiate drive-by downloads. That may not seem like so many URLs, given the size of the Web, but hackers target the most popular Web sites. As a result, about 1.3 percent of queries to Google's search engine result in a malicious URL appearing somewhere in the results page.

Trojan Horse

A Trojan horse, or trojan, is any malware which misleads users of its true intent.

When the user executes a Trojan horse, the program performs the expected beneficial task. However, the program is also performing actions unknown to, and not in the best interests of, the user.

For example, where a user is deceived into executing an email attachment disguised to appear not suspicious, (e.g., a routine form to be filled in), or by clicking on some fake advertisement on social media or anywhere else.

Trojans may allow an attacker to access users' personal information such as banking information, passwords, or personal identity. It can also delete a user's files or infect other devices connected to the network.

The term is derived from the Ancient Greek story of the deceptive Trojan Horse that led to the fall of the city of Troy.

One example of a Trojan horse is Mocmex. It was first uncovered in 2008 in digital picture frames manufactured in China. It spread from digital picture frames to computer hard drives and other portable storage devices people attached to their PCs. The purpose of the Trojan horse appeared to be to steal passwords to online computer games.

A **backdoor Trojan** is a Trojan horse that gives the attacker access to the victim's computer.

For example, a backdoor Trojan may design to cleanse malware from a computer, but in actuality it installs spyware.

Rootkit

A **rootkit** is a malicious software that allows an unauthorized user to have privileged access to a computer and to restricted areas of its software.

Once installed, a rootkit is activated every time the computer is booted.

Rootkits are difficult to detect because they start running before the operating system has completed booting up, and they can use security privileges to mask their presence.

A **rootkit** may contain a number of malicious tools such as keyloggers, banking credential stealers, password stealers, antivirus disablers, and bots for DDoS attacks.

Spyware and Adware

Spyware is a program that communicates over an Internet connection without the user's knowledge or consent.

Spyware programs can monitor Web surfing, log keystrokes, take snapshots of the computer screen, and send reports back to a host computer. Spyware is often part of a rootkit.

Adware is a type of spyware that displays pop-up advertisements related to what the user is doing.

Since people would not intentionally download a spyware program, spyware must get installed using deception. Free software downloaded from the Internet often contains spyware.

Alternatively, the spyware may be a Trojan horse, tricking users into downloading it because they think it serves a useful purpose. A Trojan horse containing spyware is an example of a backdoor Trojan.

What is Adware?

What is Adware?



Bots and Botnets

A **bot** is a particular kind of backdoor Trojan that responds to commands sent by a command-and-control program located on an external computer.

A collection of bot-infected computers is called a **botnet**, and a person who controls a botnet is called a **bot herder**. Botnets can range in size from a few thousand computers to over a million computers. In most cases, people have no idea that their PCs have been compromised and are part of a botnet.

It's been estimated that as much as 90 percent of spam is distributed through botnets [40]. Bots can also be used as spyware, stealing files or logging keystrokes to gain credit card numbers or other sensitive information.

What is a Botnet?



NOTE: Click "Next" to proceed.

4.3 || Cyber Crime and Cyber Attacks

Phishing and Spear Phishing

A **phishing** (pronounced “fishing”) attack is a large-scale effort to gain sensitive information from gullible computer users. An attacker sends out millions of email messages from a botnet. The messages inform the recipients that one of their accounts has been compromised and directs them to connect to a Web site to resolve the problem. Targeted users that click on the link encounter an impostor Web site designed to resemble the genuine e-commerce site. Once on the site, they are asked for a login name, password, and other private information. Information collected by the imposter site can then be used for identity theft.

Spear phishing is a variant of phishing in which the attacker selects email addresses that target a particular group of recipients. For example, an attacker may target elderly people judged to be more gullible or members of a group that have access to valuable information

What is Phishing?



SQL Injection

SQL injection is a method of attacking a database-driven Web application that has improper security.

The attacker accesses the application like any other client of the application, but by inserting (injecting) an SQL query into a text string from the client to the application, the attacker can trick the application into returning sensitive information.

SQL Injection - Simply Explained



Denial-of-Service and Distributed Denial-of-Service Attacks

A **denial-of-service (DoS) attack** is an intentional action designed to prevent legitimate users from making use of a computer service [44]. A DoS attack may involve unauthorized access to one or more computer systems, but the goal of a DoS attack is not to steal information. Instead, the aim of a DoS attack is to disrupt a computer server's ability to respond to its clients. Interfering with the normal use of computer services can result in significant harm. A company selling products and services over the Internet may lose business. A military organization may find its communications disrupted. A government or nonprofit organization may be unable to get its message out to the public.

In a **distributed denial-of-service (DDoS) attack**, the attacker rents access to a botnet from a **bot herder**. At the selected time, the command-and-control computer sends the appropriate instructions to the bots, which launch their attack on the targeted system.

What is a DDoS Attack?



Cybercrime in the Philippines

NATURE OF CYBERCRIME CASES INVESTIGATED

2013 - JUNE 2019 | SOURCE: PHILIPPINE NATIONAL POLICE - ANTI-CYBERCRIME GROUP

	2013	2014	2015	2016	2017	2018	JAN - JUNE 2019	TOTAL
ONLINE LIBEL	22	112	311	498	646	1041	661	3291
ONLINE SCAM	42	154	334	511	367	1012	550	2970
ANTI PHOTO AND VIDEO VOYEURISM	10	43	52	196	355	415	356	1427
COMPUTER RELATED IDENTITY THEFT	23	61	101	175	250	395	258	1263
THREAT	29	56	106	208	207	364	217	1187
SYSTEM INTERFERENCE OR HACKING	12	41	57	116	109	184	193	712
UNJUST VEXATION	1	10	33	46	81	192	148	511
ILLEGAL ACCESS	0	0	5	26	38	144	133	346
ROBBERY WITH INTIMIDATION	3	11	30	40	57	97	35	273
ATM OR CREDIT CARD FRAUD	1	1	30	31	56	91	59	269



INQUIRER.NET

Data from the PNP Anti-Cybercrime Group (ACG) showed that online libel cases soared from only 22 incidents in 2013 to 661 from January to June 2019; as well as online scam cases from 42 to 550; photo and video voyeurism cases from 10 to 356; and computer-related identity theft cases from 23 to 258.

Cases of online threat, meanwhile, rose from 29 to 217 during the period; system interference or hacking from 12 to 193; unjust vexation from one reported case to 148; cases of illegal access from zero-incident to 133; automated teller machine (ATM) and credit card fraud from one reported case to 59; and robbery with intimidation from three to 35 incidents.

Do's and Don't in Internet Surfing

DO

set privacy settings to the most secure setting available.

**DONT**

post any information that would let someone know that your house is empty.



Most social networking sites offer ways to restrict access to make sure information is being shared only with friends and not the Internet at large.

DO

make a unique password for every social site.



Having strong, unique passwords for each site helps prevent hackers from taking over social media accounts.

DONT

post anything online that would cause problems if made public.



Follow the "Front Page Rule," which reminds social media users not to report anything they would not want to see on the front page of a newspaper.

DO

remember that superiors also have social media accounts.



Employers, school and university administrators often check Facebook, Twitter and other social media sites for information posted online.

DONT

click on links that may appear to be unusual or suspicious.



Likewise, don't click links sent through spam email, these could launch malicious software or viruses that could damage a computer.

DO

be selective about who is accepted as a "friend" or "follower."



Identity thieves can easily create fake profiles in order to obtain personal information that might otherwise have been private.

DONT

post any information that can lead hackers to passwords for online banking or other accounts.



For example, common questions for those who have forgotten their passwords like "What is your mother's maiden name?"

DO

assume that status updates, photos, and videos posted on social networks are permanent.



Just because a profile is deleted or information is removed, anyone on a computer has the ability to print text or photos or save items to a computer.

Source: PNP Anti-Cybercrime Group

5.1 || Computer Reliability: Introduction

Introduction

Computer databases track many of our activities. What happens when a computer is fed bad information, or when someone misinterprets the information retrieved from a computer? We are surrounded by devices containing embedded computers. What happens when a computer program contains an error that causes the computer to malfunction?

Sometimes the effects of a computer error are trivial. You are playing a game on your PC, do something unusual, and the program crashes, forcing you to start over. At other times computer malfunctions result in a real inconvenience. You get an incorrect bill in the mail, and you end up spending hours on the phone with the company's customer service agents to get the mistake fixed. Some software bugs have resulted in businesses making poor decisions that have cost them millions of dollars. On a few occasions, failures in a computerized system have even resulted in fatalities.

In this lesson, we examine various ways in which computerized systems have proven to be unreliable. Systems typically have many components, of which the computer is just one. We also take a look at computer simulations, which are playing an increasingly important role in modern science and engineering.

Software engineering arose out of the difficulties organizations encountered when they began constructing large software systems. Software engineering refers to the use of processes and tools that allow programs to be created in a more structured manner.

The video presentation below discuss about the Computer Reliability

Computer Reliability



NOTE: Click the "Next" button to proceed.

5.2 || Data Entry or Data Retrieval Errors

Data Entry or Data Retrieval Errors

Sometimes computerized systems fail because the wrong data have been entered into them or because people incorrectly interpret the data they retrieve.

Example:

Disenfranchised Voters

In the November 2000 general election, Florida disqualified thousands of voters because pre-election screening identified them as felons. The records in the computer database, however, were incorrect; the voters had been charged with misdemeanors. Nevertheless, they were forbidden from voting. This error may have affected the outcome of the presidential election.

Software and Billing Errors

Even if the data entered into a computer are correct, the system may still produce the wrong result or collapse entirely if there are errors in the computer programs manipulating the data. Newspapers are full of stories about software bugs or “glitches.”

Examples:

Errors Leading to System Malfunctions

1. Linda Brooks of Minneapolis, Minnesota, opened her mail on July 21, 2001, and found a phone bill for \$57,346.20. A bug in Qwest's billing software caused it to charge some customers as much as \$600 per minute for the use of their cell phones. About 1.4 percent of Qwest's customers, 14,000 in all, received incorrect bills. A Qwest spokesperson said the bug was in a newly installed billing system.
2. The US Department of Agriculture implemented new livestock price-reporting guidelines after discovering that software errors had caused the USDA to understate the prices meatpackers were receiving for beef. Since beef producers and packers negotiate cattle contracts based on the USDA price reports, the errors cost beef producers between \$15 and \$20 million.
3. In 1996 a software error at the US Postal Service caused it to return to the senders two weeks' worth of mail addressed to the Patent and Trademark Office. In all, 50,000 pieces of mail were returned to the senders.

4. A University of Pittsburgh study revealed that, for most students, computer spelling and grammar error checkers actually increased the number of errors they made.
5. Between September 2008 and May 2009, hundreds of families living in public housing in New York City were charged too much rent because of an error in the program that calculated their monthly bills. For nine months, the New York City Housing Authority did not take seriously the renters' complaints that they were being overcharged. Instead, it took to court many of the renters who did not make the higher payments and threatened them with eviction.

Errors Leading to System Failures

1. On the first day a new, fully computerized ambulance dispatch system became operational in the city of London, people making emergency calls were put on hold for up to 30 minutes, the system lost track of some calls, and ambulances took up to three hours to respond. As many as 20 people died because ambulances did not arrive in time. A software error led the Chicago Board of Trade to suspend trading for an hour on January 23, 1998. Another bug caused it to suspend trading for 45 minutes on April 1, 1998. In both cases the temporary shutdown of trading caused some investors to lose money [14]. System errors caused trading on the London International Financial Futures and Options Exchange to be halted twice within two weeks in May 1999. The second failure idled dealers for an hour and a half.

Notable Software System Failures

In this section, we shift our focus to complicated devices or systems controlled at least in part by computers. An **embedded system** is a computer used as a component of a larger system. You can find microprocessor-based embedded systems in microwave ovens, thermostats, automobiles, traffic lights, and a myriad of other modern devices. Because computers need software to execute, every embedded system has a software component.

Software is playing an ever-larger role in system functionality. There are several reasons why hardware controllers are being replaced by microprocessors controlled by software. Software controllers are faster. They can perform more sophisticated functions, taking more input data into account. They cost less, use less energy, and do not wear out. Unfortunately, while hardware controllers have a reputation for high reliability, the same cannot be said for their software replacements.

Most embedded systems are also real-time systems: computers that process data from sensors as events occur. The microprocessor that controls the airbags in a modern automobile is a real-time system because it must instantly react to readings from its sensors and deploy the airbags at the time of a collision. The microprocessor in a cell phone is another example of a real-time system that converts electrical signals into radio waves and vice versa.

Examples:

Ariane 5

The Ariane 5 was a satellite launch vehicle designed by the French space agency, the Centre National d'Etudes Spatiales, and the European Space Agency. About 40 seconds into its maiden flight on June 4, 1996, a software error caused the nozzles on the solid boosters and the main rocket engine to swivel to extreme positions. As a result, the rocket veered sharply off course. When the links between the solid boosters and the core stage ruptured, the launch vehicle self-destructed. The rocket carried satellites worth \$500 million, which were not insured.

A board of inquiry traced the software error to a piece of code that converts a 64-bit floating-point value into a 16-bit signed integer. The value to be converted exceeded the maximum value that could be stored in the integer variable, causing an exception to be raised. Unfortunately, there was no exception-handling mechanism for this particular exception, so the onboard computers crashed.

The faulty piece of code had been part of the software for the Ariane 4. The 64-bit floating-point value represented the horizontal bias of the launch vehicle, which is related to its horizontal velocity. When the software module was designed, engineers determined that it would be impossible for the horizontal bias to be so large that it could not be stored in a 16-bit signed integer. There was no need for an error handler because an error could not occur. This code was moved "as is" into the software for the Ariane 5. That proved to be an extremely costly mistake because the Ariane 5 was faster than the Ariane 4. The original assumptions made by the designers of the software no longer held true.

Robot Missions to Mars

NASA designed the \$125-million Mars Climate Orbiter to facilitate communications between Earth and automated probes on the surface of Mars, including the Mars Polar Lander. Ironically, the spacecraft was lost because of a miscommunication between two support teams on Earth.

The Lockheed Martin flight operations team in Colorado designed its software to use English units. Its program output thrust in terms of foot-pounds. The navigation team at the Jet Propulsion Laboratory in California designed its software to use metric units. Its program expected thrust to be input in terms of newtons. One foot-pound equals 4.45 newtons. On September 23, 1999, the Mars Climate Orbiter neared the Red Planet. When it was time for the spacecraft to fire its engine to enter orbit, the Colorado team supplied thrust information to the California team, which relayed it to the spacecraft. Because of the units mismatch, the navigation team specified 4.45 times too much thrust. The spacecraft flew too close to the surface of Mars and burned up in its atmosphere.

When NASA Lost a Spacecraft Because It Didn't Use Metric...



A few months later NASA's Martian program suffered a second catastrophe. The Mars Polar Lander, produced at a cost of \$165 million, was supposed to land on the south pole of Mars and provide data that would help scientists understand how the Martian climate has changed over time. On December 3, 1999, NASA lost contact with the Mars Polar Lander. NASA engineers suspect that the system's software got a false signal from the landing gear and shut down the engines 100 feet above the planet's surface.

Tony Spear was the project manager of the Mars Pathfinder mission. He said, "It is just as hard to do Mars missions now as it was in the mid-70s. I'm a big believer that software hasn't gone anywhere. Software is the number-one problem".

Several years after Spear made this observation, NASA successfully landed two Mars Exploration Rovers on the Red Planet. The rovers, named Opportunity and Spirit, were launched from Earth in June and July of 2003, successfully landing on Mars in January 2004. Mission planners had hoped that each rover would complete a three-month mission, looking for clues that the Martian surface once had enough water to sustain life. The rovers greatly exceeded this goal. The Spirit rover operated successfully for more than five years. Opportunity found evidence of a former saltwater lake and was still operational ten years after its launch.

5.3 || Computer Simulation

Computer Simulation

Uses of Simulations

Computer simulation plays a key role in contemporary science and engineering. There are many reasons why a scientist or engineer may not be able to perform a physical experiment. It may be too expensive or time-consuming, or it may be unethical or impossible to perform. Computer simulations have been used to design nuclear weapons, search for oil, create pharmaceuticals, and design safer, more fuel-efficient cars. They have even been used to design consumer products such as disposable diapers.

Examples of uses of simulations

Some computer simulations model past events. For example, when astrophysicists derive theories about the evolution of the universe, they can test them through computer simulations. A computer simulation has demonstrated that a gas disk around a young star can fragment into giant gas planets such as Jupiter.

The second use of computer simulations is to understand the world around us. One of the first important uses of computer simulations was to aid in the exploration for oil. By using computer simulations, the process becomes much more predictable. Geologists layout networks of microphones and set off explosive charges. Computers analyze the echoes received by the microphones to produce graphical representations of underground rock formations. Analyzing these formations helps petroleum engineers select the most promising sites to drill.

Computer simulations are also used to predict the future. Modern weather predictions are based on computer simulations. These predictions become particularly important when people are exposed to extreme weather conditions, such as floods, tornadoes, and hurricanes.

Validating Simulations

A computer simulation may produce erroneous results for two fundamentally different reasons.

1. The program may have a bug in it, or
2. the model upon which the program is based may be flawed.

One way to validate a model is to make sure it duplicates the performance of the actual system. For example, automobile and truck manufacturers create computer models of their products. They use these models to see how well vehicles will perform in a variety of crash situations. Crashing an automobile on a computer is faster and much less expensive than crashing an actual car. To validate their models, manufacturers compare the results of crashing an actual vehicle with the results predicted by the computer model.

A final way to validate a computer model is to see if it has credibility with experts and decision-makers. Ultimately, a model is valuable only if it is believed by those who have the power to use its results to reach a conclusion or make a decision.

NOTE: Click the "Next" button to proceed.

5.4 || Software Engineering

Software Engineering

Software engineering is an engineering discipline focused on the production of software, as well as the development of tools, methodologies, and theories supporting software production.

Software engineers follow a four-step process to develop a software product:

1. Specification: defining the functions to be performed by the software
2. Development: producing the software that meets the specifications
3. Validation: testing the software
4. Evolution: modifying the software to meet the changing needs of the customer

Specifications

The process of specification focuses on **determining the requirements of the system** and the **constraints under which it must operate**. Software engineers communicate with the intended users of the system to determine what their needs are. They must decide if the **software system is feasible** given the budget and the schedule requirements of the customer.

The software engineers may **develop prototypes of the user interface** to confirm that the system will meet the user's needs.

The specification process results in a high-level statement of requirements and perhaps a **mock-up of the user interface** that the users can approve. The software engineers also **produce a low-level requirements statement** that provides the details needed by those who are going to actually implement the software system.

Development

During the development phase, software engineers produce a working software system that matches the specifications. The first design is based on a high-level, abstract view of the system. The process of developing the high-level design reveals ambiguities, omissions, or outright errors in the specification. When these mistakes are discovered, the specification must be amended. Fixing mistakes is quicker and less expensive when the design is still at a higher, more abstract level.

Validation (Testing)

The purpose of validation (also called testing) is to ensure the software satisfies the specification and meets the needs of the user. In some companies, testing is an assignment given to newly hired software engineers, who soon move on to design work after proving their worth. However, good testing requires a great deal of technical skill, and some organizations promote testing as a career path.

Testing is usually performed in stages:

In the first stage of testing, each individual module of the system is tested independently. It is easier to isolate and fix the causes of errors when the number of lines of code is relatively small. After each module has been debugged, modules are combined into larger subsystems for testing. Eventually, all the subsystems are combined in the complete system. When an error is detected and a bug is fixed in a particular module, all the test cases related to the module should be repeated to see if the change that fixed one bug accidentally introduced another bug.

Evolution

Successful software systems evolve over time to meet the changing needs of their users. The evolution of a software system resembles the creation of a software system in many ways. Software engineers must understand the needs of the users, assess the strengths and weaknesses of the current system, and design modifications to the software.

NOTE: Click the "Next" button to proceed.

6.1.2 || Whistle-Blowing

Whistle-Blowing

A whistle-blower is someone who breaks ranks with an organization in order to make an unauthorized disclosure of information about a harmful situation after attempts to report the concerns through authorized organizational channels have been ignored or rebuffed. Sometimes employees become whistle-blowers out of fear that actions taken by their employer may harm the public; other times they have identified fraudulent use of tax dollars.



Figure 2 The explosion of the Challenger killed seven astronauts, including the first civilian in space, Christa McAuliffe.

Overview of Whistleblowing

- Whistleblower
 - Tries to report harmful situation through authorized channels
 - Rebuffed by organization
 - Makes disclosure through unauthorized channels
- Whistleblowers punished for their actions
 - Lose job or all chances of advancement
 - Financial and emotional hardship

- False Claims Act
- Whistleblower Protection Act

Case: Morton Thiokol/NASA

- *Challenger* explosion
- Roger Boisjoly and Morton Thiokol engineers documented the dangers of low-temperature launches
- Morton Thiokol executives and NASA officials overrode and hid concerns
- Boisjoly shared information with the Presidential commission
- Morton Thiokol retaliated
 - Boisjoly took medical leave for stress, then quit
 - Found a job as a consultant two years later

Motives of Whistleblowers

- People become whistleblowers for different reasons
- Morality of action may depend on motives
- Good motive
 - Desire to help the public
- Questionable motives
 - Retaliation
 - Avoiding punishment

Corporate Response to Whistleblowing

- Whistleblowers are disloyal
- Whistleblowing has many harms
 - Bad publicity
 - Disruption of the organization's social fabric
 - Makes it hard for people to work as a team
- If a company causes harm, the public can use legal remedies to seek damages
- Critique: Overly legalistic view of public harm?

Whistleblowing as Organizational Failure

- Whistleblowing harms organization
 - Bad publicity
 - Ruined careers
 - Erodes team spirit
- Whistleblowing harms whistleblower
 - Retaliation

- Estrangement
- Organizations should improve communication
- Critique
 - Is this realistic?
 - Robert Spitzer: Organizations should return to using principle-based ethics in decision making

Whistleblowing as Moral Duty

- Richard DeGeorge's questions for whistleblowing
 1. Is serious harm to the public at stake?
 2. Have you told your manager?
 3. Have you tried every possible inside channel?
 4. Do you have persuasive documented evidence?
 5. Are you sure whistleblowing will work?
- Under what conditions must you blow the whistle?
 - DeGeorge: If all five conditions are met
 - Others: If conditions 1-3 are met
 - Still others: Whistleblowing is *never* morally required

NOTE: Click "**Next**" to proceed.

6.2 || Work and Wealth

Introduction

- Information technology and automation affecting workplace
 - Increases in productivity
 - Globalization of job market
 - Organization of companies
 - Telework
 - Workplace monitoring
- Impacts of information technology on society
 - Digital divide
 - Winner-take-all effects

Automation and Job Destruction

- Lost manufacturing jobs
 - 43 million jobs lost between 1979 and 1994
 - Manufacturing workers: 35% (1947) ® 12% (2002)
- Lost white-collar jobs
 - Secretarial and clerical positions (e-mail, vmail, ...)
 - Accountants and bookkeepers (spreadsheets)
 - Middle managers (economic recovery, 1991-1996 and downsizing and automation)
- Juliet Schor: Work week got longer between 1979 and 1990 (163 hour per year = month)

Automation and Job Creation

- Automation lowers prices of products
- It also increases the real incomes of customers
- That increases the demand for other products
- Increased demand ® more jobs

- The number of manufacturing jobs worldwide is increasing
- Martin Carnoy: Workers today work less than workers 100 years ago

Effects of Increase in Productivity

- Higher productivity ® higher material standard of living
- Hours worked per year high in the United States
 - Fewer hours worked in France or Germany
 - Fewer hours worked by ancient Greeks, Romans
 - Fewer hours worked by “stone age” societies
- Protestant work ethic (reformation– more capitalism)
- Time versus possessions
 - People work harder to get leisure

Rise of the Robots?

- Some experts suggest most jobs will be taken over by machines
- Artificial intelligence: field of computer science focusing on intelligent behavior by machines
- Rapid increases in microprocessor speeds have led to various successes in AI
- What will happen as computers continue to increase in speed?

Moral Question Related to Robotics

- Is it wrong to create machines capable of making human labor obsolete?
- Will intelligent robots demoralize humanity?
- Is it wrong to work on an intelligent machine if it can't be guaranteed the machine will be benevolent toward humans?
- What if a malevolent human puts intelligent machines to an evil use?
- How will creative computers change our ideas about intellectual property? If they can do everything.

Organizational Changes

- Information technology integration into firms
 - Automating back-office functions (e.g., payroll)
 - Improving manufacturing
 - Improving communication among business units

- Results

- Flattened organizational structures
 - Eliminating transactional middlemen (supply-chain automation)
 - Greater need for certain jobs (DBA, analysts,..)

Telework

- Arrangement in which employees work away from the traditional place of work
- Examples
 - Home office
 - Commuting through the telecenter
- Provides employees from different firms the ability to connect to their company's computers.
 - Salespersons with no office (only cell phones and laptops in their car)
- About 20% of Americans do some telework

Advantages of Telework

- Increases productivity
- Reduces absenteeism
- Improves morale (more freedom)
- Saves overhead (offices, ...)
- Helps the environment (reduce pollution of traffic)
- Saves employees money

Disadvantages of Telework

- Threatens managers' control and authority
- Makes face-to-face meetings impossible
- Sensitive information less secure
- Team meetings more difficult
- Teleworkers less visible (forgotten for promotion)
- Teleworkers "out of the loop"
 - Less likely to contact them from employees at offices
- Isolation of teleworkers
- Teleworkers work longer hours for the same pay

Temporary Work

- Companies less committed to employees
- Lay-offs not taboo as they once were
- Companies hiring more temporary employees
 - Saves money on benefits
 - Makes it easier to downsize
- Long-term employment for one firm less common

Monitoring

- 82% of companies monitor employees in some way
 - Purpose: Identify inappropriate use of company resources
 - Can also detect illegal activities
- Employee was hacking on his previous company that denied him from promotion
- Other uses of monitoring
 - Gauge productivity (10% of firms)
 - Improve productivity (employee tracking)
 - Improve security (at schools)

Multinational Teams

- Software development teams in India since the 1980s (GE and Citibank)
- Advantages of multinational teams
 - Company has people on duty more hours per day
 - Cost savings (wages in India are lower than the USA)
- The disadvantage of multinational teams
 - Poorer infrastructure in less developed countries

Globalization

- Globalization: process of creating a worldwide network of businesses and markets
- Globalization causes greater mobility of goods, services, and capital around the world
- Globalization made possible through rapidly decreasing cost of information technology

Arguments for Globalization

- Increases competition
- People in poorer countries deserve jobs, too
- It is a tried-and-true route for a poor country to become prosperous
 - By producing goods for the world market, rather than being self-sufficient
- Global jobs reduce unrest and increase stability
 - Interdependent economies mean fewer wars

Arguments against Globalization

- Makes the United States subordinate to the World Trade Organization
 - WTO makes the rules for globalization
- Forces American workers to compete with foreigners who do not get decent wages and benefits
- Accelerates exodus of manufacturing and white-collar jobs from the United States
- Hurts workers in foreign countries
 - Removing tariffs means fewer costs of products
 - Ex: grain in Mexico

Dot-Com Bust Increases IT Sector Unemployment (2000-2002)

- Dot-com: Internet-related start-up company
- Early 2000: stock prices of dot-coms fell sharply
- Hundreds of dot-coms went out of business (862 firm)
- Half a million high-tech jobs lost

Foreign Workers in the IT Industry

- Visas allow foreigners to work inside U.S.
- H1-B
 - Right to work up to six years
 - Company must show no qualified Americans available
 - Tens of thousands of H1-B visas issued despite dot-com bust
- L-1
 - Allows a company to transfer a worker from an overseas facility to the United States

–Workers do not need to be paid the prevailing wage

–Tens of thousands issued every year

Foreign Competition

- IT companies in developing countries, particularly India and China, are increasingly capable
- IBM sold its PC division to Chinese company Lenovo in 2004
- IT outsourcing to India is growing rapidly
- Number of college students in China increasing rapidly
- ACM Collegiate Programming Contest provides evidence of global competition.
 - 1st place ---shanghai university, 17th ---- Illinois university

The Digital Divide

- Digital divide: some people have access to modern information technology while others do not
- Underlying assumption: people with access to telephones, computers, the Internet have opportunities denied to those without access
- The concept of the digital divide became popular with the emergence of the World Wide Web

Evidence of the Digital Divide

- Global divide

What is hampering Internet development in developed countries?

- Access higher in wealthy countries
- Access higher where IT infrastructure good
- Access higher where literacy higher
- Access higher in English-speaking countries
- Access higher where IT is culturally valued
- They don't value IT in developed countries (it is not a priority)
- Social divide
 - Access higher for young people (18-29 years ----88% of access)
 - Access higher for well-educated people

Models of Technological Diffusion

- Technological diffusion: the rate at which new technology is assimilated

- Group A: highest socioeconomic status
- Group B: middle socioeconomic status
- Group C: lowest socioeconomic status
- Normalization model
 - Group A adopts first, then Group B, finally Group C
 - Eventually A use = B use = C use
- Stratification model
 - Group A adopts first, then Group B, finally Group C
 - A use > B use > C use forever

Critiques of the Digital Divide

- DD talk suggests the difference between “haves” and “have nots” is simply about access
 - No talk about culture, language, literacy, and values
- DD talk puts everyone in two categories: “haves” and “have nots”, but the reality is a continuum
 - Someone with 56K modem has access and other has ADSL has too
- DD implies lack of access leads to less advantaged social position, but maybe it is the other way around
 - less advantaged social position tends to adopt new technologies at later times.
- Internet is not the pinnacle of information technology

The Winner-Take-All Phenomenon

- Winner-take-all: a few top performers have disproportionate share of wealth
- Causes
 - IT and efficient transportation systems
- Recording tapes vs CDs
 - Network economies
- Windows PC vs Macintosh PC
 - Dominance of English language (68 countries use it)
- De facto language of international business

–Changing business norms

- Businesses compete to recruit top executives from outside

Harmful Effects of Winner-Take-All

- Drawing some of most talented people into socially unproductive work
- May increase the gap between rich and poor
- Creating wasteful investment, consumption

–Go to an interview with \$600 suit to get a job or to enroll in a top law school

- Concentrating a disproportionate share of best students in a few elite institutions (top universities)
- Unfairly compensating those with just slightly inferior performance – Ex: athletics
- Harming our culture

–Best seller authors will dominate book publishing

–New authors has little chance

Reducing Winner-Take-All Effects

- Enacting laws limiting number of hours stores can remain open
- Allowing cooperative agreements among businesses
- Creating more progressive tax structures
- Implementing campaign finance reform to reduce the percentage of those who dominate the market.

–1% of the population controls 37% of the wealth

NOTE: Click "**Next**" to proceed in the Summary.

Midterm Examination in GEE 002

Due Apr 14 at 1:30pm **Points** 55 **Questions** 55

Available Apr 14 at 10:30am - Apr 14 at 1:30pm 3 hours **Time Limit** 120 Minutes

Instructions

Instructions:

- Read and understand the question carefully
- Choose the correct answer.
- You cannot go back to the previous question.
- You are given exactly 120 minutes to answer the questions.
- Don't open other resources like Mobile Applications, Lectures Notes, and online materials aside from Canvas.
- DO NOT ATTEMPT TO OPEN OTHER APPLICATIONS ASIDE FROM CANVAS TO AVOID GETTING A ZERO IN THE ASSESSMENT. Student Activity Logs are available for monitoring purposes.
- One (1) Point for each number. Total Points: 60
- Take the examination with honesty and integrity.

God Bless Everyone!

This quiz was locked Apr 14 at 1:30pm.

Attempt History

	Attempt	Time	Score
LATEST	<u>Attempt 1</u>	14 minutes	46 out of 55

Score for this quiz: **46** out of 55

Submitted Apr 14 at 11:13am

This attempt took 14 minutes.

Question 1

1 / 1 pts

Choose the correct definition of Patent.



Permit the owner to “exclude” others from making, using, selling, offering for sale, and importing a product or service embodying the invention.



Permit the owner to “include” others from making, using, selling, offering for sale, and importing a product or service embodying the invention.

Correct!



A patent is an exclusive right granted for an invention, which is a product or a process that provides, in general, a new way of doing something, or offers a new technical solution to a problem.

Question 2

1 / 1 pts

Choose the correct definition of Copyright :



To copy the information the right way.



Copyright is a protection given to authors, copyright owner and performer of their copyright work and performances



Permit the owner to “include” others from making, using, selling, offering for sale, and importing a product or service embodying the invention.

Correct!

Question 3**1 / 1 pts**

If Jean invents a new process for recording music, she will likely apply for a:

- Industrial Design
- Trademark
- Patent
- Copyright

Correct!**Question 4****1 / 1 pts**

The rights of an author or artist with respect to his or her creation are governed by the law of:

- copyrights
- industrial design
- Trademark
- Patent

Correct!**Question 5****1 / 1 pts**

A street vendor on Quiapo Street is selling fake "CASIA" watches. Under which area of intellectual property would the Casio Computer Co., Ltd. likely seek a remedy?

- Trademarks

Correct!

- Industrial design
- Patent
- Copyrights

Question 6

1 / 1 pts

Choose the correct definition of trademarks :

- The ornamentation or shape of a functional object, such as a chair
- The right to prevent others from copying or modifying certain works

Correct!

A trade mark is a sign which distinguishes the goods and services of one trader from those of another. A mark includes words, logos, pictures, names, letters, numbers or a combination of these.

- A monopoly to make, use, or sell an invention

Question 7

1 / 1 pts

If you write an original story, what type of intellectual property gives you the right to decide who can make and sell copies of your work?

- patents
- geographical indications
- copyright
- trademarks

Correct!

Question 8**1 / 1 pts**

If a company develops a new technology that improves its main product, what type of intellectual property can they use to stop others from copying their invention?

Correct!

- patents
- trademarks
- copyright
- geographical indications

Question 9**1 / 1 pts**

Imagine a footballer sets up his own company to sell his own range of clothes. What type of intellectual property can he use to show that the clothes are made by his company?

- copyright
- patent
- trademarks

Correct!**Question 10****0 / 1 pts**

Which of the following is not a valid reason for revoking or denying a registered intellectual property right?

- The patent was granted to person who was not entitled to it
- The invention is nor patentable invention

Correct Answer

- The patent applicant already has a similar patent in their name

You Answered

- The patent does not disclose the invention clearly enough for it to be performed by a person skilled in the art

Question 11

1 / 1 pts

Practice of registering a trade mark as a domain name with the intention of later selling it to the rightful owner.

- Patent
- Design Right
- Cybersquatting
- Copyright

Correct!**Question 12**

0 / 1 pts

What is a patent?

Correct Answer

- An exclusive right granted for a work
- A right that does not protect any creative work
- An inclusive right to distribute any invention
- It protects secret information

You Answered**Question 13**

1 / 1 pts

Bootleg or pirated DVDs or CDs are examples of copyright infringement

Correct!

True

False

Question 14

0 / 1 pts

All of the following are protected by trademarks **EXCEPT**

Answered

Number and letter combinations like 3M

Unique product shapes as long as they have no bearing on the product function, such as the famous curved bottle of Coca Cola

Correct Answer

A video of a play created and performed by a college drama class

Logos such as the Apple on Apple's product

Question 15

1 / 1 pts

Each of the following is a form of intellectual property **EXCEPT**

a website design

a patent on a business process

the name of the website "Google"

Correct!

the recipe for apple pie that has been passed down through your family for several generations

Question 16**1 / 1 pts**

A small file on a computer that is created when a user visits a Web site. It is also used to identify users who visit the site and track the preferences of the users.

Correct! cookie cache memory antivirus firewall**Question 17****1 / 1 pts**

A filter that blocks unreliable and unauthorized information from the Internet before it reaches your computer or a private network. It provides additional protection against threats such as hackers and viruses.

Correct! firewall cookie active content encryption

Question 18**1 / 1 pts**

A person who uses computer expertise to gain unauthorized access to a computer, and then misuses or tampers the programs and data stored on the computer.

- programmer
- none of these
- hacker
- web administrator

Correct!**Question 19****1 / 1 pts**

The act of extracting personal information, such as passwords and credit card details, from computer users and then use the information for malicious purposes.

- online predator
- phishing
- cybersquatting
- none of these

Correct!**Question 20****1 / 1 pts**

The act of copying someone's work and using it as if it is your own work, without mentioning the source.

- plagiarism

Correct!

phishing none of these hacking**Question 21**

1 / 1 pts

Unauthorized copying of copyrighted software without obtaining the license or permission of its copyright owner.

Correct! software piracy SQL Injection identity theft libel**Question 22**

1 / 1 pts

A third party who processes personal data on behalf of the data controller.

Correct! Personal Information Processor Personal Information Controller**Question 23**

1 / 1 pts

A computer program that is installed on your computer without your knowledge. It can secretly send out information about your Web

browsing habits or other personal details to another computer through the network.

Slander

Correct!

Spyware

phishing

software piracy

Question 24

1 / 1 pts

A destructive computer program disguised as a game, utility, or software. When run it does something harmful to the computer system while appearing to do something useful.

Cross-site scripting

Adware

Trojan horse

Drive by downloads

Correct!

Question 25

1 / 1 pts

A computer program that propagates itself across computers, usually by creating copies of itself in each computer's memory. It might duplicate itself in one computer so often that it causes the computer to crash.

Correct!

worm

snake

virus spam**Question 26**

0 / 1 pts

It refers to the unintentional download of malicious code to your computer or mobile device that leaves you open to a cyberattack.

Correct Answer drive-by download Trojan Horses Cross-site scripting Adware**You Answered****Question 27**

1 / 1 pts

People who create networks by launching programs that search the Internet for computers with inadequate security and install software robot programs.

 software engineer programmers web developers bot herders**Correct!****Question 28**

1 / 1 pts

Trademark infringement is the use or production of copyright-protected material without the permission of the copyright holder.

True

False

Correct!

Question 29

1 / 1 pts

The 'legal' person that determines how the data will be processed.

Personal Information Controller

Personal Information Processor

Correct!

Question 30

1 / 1 pts

_____ refers to the manipulation of a person inside the organization to gain access to confidential information.

Social engineering

Eavesdropping

Dumpster diving

Correct!

Question 31

0 / 1 pts

The first worm to strike instant messaging systems appeared in 2001.

Correct Answer Hello Palevo Chokes None of these**You Answered****Question 32**

1 / 1 pts

Antimalware tools are designed to protect computers against malware, such as viruses, worms, Trojan horses, adware, and spyware.

Correct! True False**Question 33**

1 / 1 pts

The hacker in the past was an explorer, a risk-taker, someone who was trying to make a system do something it had never done before.

Correct! True False**Question 34**

1 / 1 pts

It means looking through garbage for interesting bits of information.

 Eavesdropping

Correct! Dumpster diving Social engineering**Question 35**

1 / 1 pts

It is a worm launched in April 2004, exploited PCs running the Windows operating system by simply shut themselves down shortly after booting.

 Choke worm Kelvir worm Palevo worm Sasser worm**Correct!****Question 36**

0 / 1 pts

Conficker is also known as _____ worm.

 W32/Hello Kelvir Choke**You Answered****Correct Answer** Downadup**Question 37**

1 / 1 pts

In the Philippines, the House Bill _____ entitled an Act of Defining and Penalizing the Crime of Cyber-bullying otherwise known as Anti-Bullying Act of 2015.

Correct!

5718

507

1024

5187

Question 38

1 / 1 pts

A form of direct censorship that is essential for material the government wishes to keep secret, such as information about its nuclear weapons program.

Licensing and registration

Government monopolization

Prepublication review

Correct!

Question 39

1 / 1 pts

A form of direct censorship that the government owned all the television stations, radio stations and newspapers.

Licensing and registration

Government monopolization

Prepublication review

Correct!

Question 40**1 / 1 pts**

A form of direct censorship that is used to control media with limited bandwidth.

Correct!

- Licensing and registration
- Government monopolization
- Prepublication review

Question 41**1 / 1 pts**

The most common form of censorship that a group decides for itself not to publish material.

Correct!

- self censorship
- direct censorship

Question 42**1 / 1 pts**

It is about access, use, and collection of data, and the data subject's legal right to the data.

Correct!

- Consent
- Sensitive Personal Information
- Data Privacy
- Personal Identifiable Information

Question 43

0 / 1 pts

It is about an individual's race, ethnic origin, marital status, age, color, and religious, philosophical, or political affiliations.

Personal Information Controller

Sensitive personal information

Personal Information Processor

Personal Identifiable Information

Correct Answer**You Answered****Question 44**

1 / 1 pts

Whenever anyone is making audio or video recordings of you, or even taking your pictures, you have the right to know, and you must always be given a chance to opt-out when you don't feel comfortable. What kind of data privacy right is this?

Data subjects have the right to access information

Data subjects have the right to correct information.

Data subjects have the right to be informed

The right of Data portability

Correct!**Question 45**

0 / 1 pts

You may claim compensation if you suffered damages due to inaccurate, incomplete, outdated, false, unlawfully obtained or

unauthorized use of personal data, considering any violation of your rights and freedoms as a data subject.

DU Answered

- Data subjects have the right to correct information.

- Data subjects have the right to object.

- Data subjects have the right to erasure.

- Data subjects have the right to Damages

Correct Answer

Question 46

1 / 1 pts

You have the right to suspend, withdraw or order the blocking, removal or destruction of your personal data.

- Data subjects have the right to be informed.

- Data subjects have the right to erasure.

- Data subjects have the right to object.

- Data subjects have the right to correct information.

Correct!

Question 47

1 / 1 pts

An individual had been involved in an incident inside and outside a Manila restaurant where his wallet was stolen. He also suffered minor injuries in the incident. He requested access to the restaurant CCTV footage relating to himself, saying he wants to see all details surrounding the incident and possibly figure out a way to recover his wallet. What kind of data privacy right is observed in this scenario?

- Data subjects have the right to be informed.

Correct!

- Data subjects have the right to erasure
- Data subjects have the right to access information
- Data subjects have the right to object.

Question 48**1 / 1 pts**

In case you want to close your Facebook account and leave the service, or simply feel like you've shared a lot of information about your life and want a backup of all your Facebook data, you may exercise this right.

- your right to access
- your right to damages
- your right to be informed

Correct!

- your right to data portability

Question 49**1 / 1 pts**

Your profile in FB is an example of offline identity.

- True
- False

Correct!**Question 50****1 / 1 pts**

Companies with 250 employees or 1000 data subjects must comply with the Data Privacy Act of 2012.

Correct! True False**Question 51****1 / 1 pts**

Leo is assigned to interview a client for his project. He asked permission from the client that he will record their conversation. What right does Leo showed to his client?

 The right of his client to complain. The right of his client to be informed. The right of his client to object. The right of his client to access.**Correct!****Question 52****0 / 1 pts**

National Protection Commission protects individual personal information and upholds the right to privacy by regulating the processing of personal information.

Answered True**Correct Answer** False**Question 53****1 / 1 pts**

Daniela wants to stop receiving a marketing campaign from a company. She requested the company to stop sending it. What right does Daniela

can exercise in this situation?

- Right of data portability.
- Right to be informed.
- Right to object.
- Right to correct information.

Correct!

Question 54

1 / 1 pts

You are a student and you found out on your registration card that your first name was misspelled. You have the right to _____.

Correct!

- correct your information
- access your information
- object your information
- erase your information

Question 55

1 / 1 pts

If your personal data was used by a company without your consent and this caused damage to you like unemployment. What right may you exercise?

- The right to object.
- The right to damages
- The right to be informed.
- The right to erasure.

Correct!

Quiz Score: **46** out of 55

TECHNOLOGICAL INSTITUTE OF THE PHILIPPINES
QUEZON CITY
COLLEGE OF COMPUTER STUDIES

44
4371

GEE 002 - Living in the IT Era

PRELIM EXAMINATION
2nd Semester S.Y. 2022-2023

Name: MENDOZA, CARL NICOLAS V.	Date: 2023-03-03 T 1100H
Course and Section: GEE 002 - CS22S1	Professor: Arceli Sald

The following questions support the attainment of CILOs:

1. Identify the milestones in Computing, Networking, Information Storage, and Retrieval.
2. Explain the role of technology in media and how it affects communication.
3. Familiarized themselves with the history of the internet and discuss the purpose of a web browser

Instructions: Write only the letter of the best answer before the number

- A 1. What motivates the invention of the cash register?
- a. Preventing embezzlement from clerks
 - b. Assist in summarizing employees information
 - c. Keeping accurate sales records for department stores
 - d. No answer text provided.
- 1 pt
- B 2. He developed an electromechanical tabulating machine for punched cards to assist in summarizing information and in accounting.
- a. Gottfried Leibniz
 - b. Herman Hollerith
 - c. James and John Ritty
 - d. Blaise Pascal
- 1 pt
- B 3. It was the first operational, fully electronic computer system that had both programs and data stored in its memory.
- a. UNIVAC II
 - b. Small-Scale Experimental Machine
 - c. FerrantiMark 1
 - d. UNIVAC I
- 1 pt
- B 4. A right guaranteed without exception.
- a. Limited right
 - b. Absolute right
 - c. Negative right
 - d. Positive right
- 1 pt
- A 5. It was the descendant of research computers constructed at the University of Manchester and the world's first commercial computer.
- a. FerrantiMark 1
 - b. UNIVAC II
 - c. UNIVAC
 - d. Small-Scale Experimental Machine
- 1 pt
- C 6. A business machine manufacturer who completed UNIVAC in 1951.
- a. IBM
 - b. Ferranti Ltd
 - c. Remington-Rand
 - d. UNIVAC
- 1 pt
- C 7. It is a program that accept a list of keywords from a user, searches a database of documents, and returns those documents most closely matching the specified keywords.
- a. Graphical User Interface
 - b. Google
- 1 pt
- B 8. It is a machine used to transmit messages in the form of electrical impulses that can be converted into data
- a. Radio
 - b. telegraph
 - c. Telephone
 - d. Remote Computing
- 1 pt
- A 9. It was invented by Alexander Graham Bell
- Group of answer choices
- a. Telephone
 - b. Television
 - c. Typewriter
 - d. Radio
- 1 pt
- D 10. It is a computing aid in which a person performs arithmetic operations by sliding counters along with rods, wires, or lines.
- a. mathematical tables
 - b. tablet
 - c. Napier bone
 - d. abacus
- 1 pt
- B 11. Symbolic representations of machine instructions
- a. FORTRAN
 - b. Assembly language
 - c. BASIC
 - d. COBOL
- 1 pt
- A 12. A right that may be restricted based on the circumstances.
- a. Limited right
 - b. Positive right
 - c. Negative right
 - d. Absolute right
- 1 pt
- C 13. It is a program that accept a list of keywords from a user, searches a database of documents, and returns those documents most closely matching the specified keywords.
- a. search engine
 - b. Hypertext
 - c. NLS system
 - d. World Wide Web
- 1 pt
- A 14. What is the first widely used Web browser?
- a. Internet Explorer
 - b. Safari
- 1 pt

- c. Mosaic
- d. Chrome

1 pt

- D 15. It is simple, easy-to-learn programming language.
It is popular language for teaching programming.
- a. COBOL
 - b. Time-Sharing Systems
 - c. Assembly language
 - d. BASIC

1 pt

- C 16. It is low-cost computers and high-speed communication networks.
- a. remote
 - b. Internet
 - c. Catalysts
 - d. WIFI

1 pt

- C 17. A right that another can guarantee by leaving you alone.
- a. Positive right
 - b. Absolute right
 - c. Negative right
 - d. Limited right

1 pt

- D 18. A semiconductor containing transistors, capacitors, and resistors
- a. Semiconductor
 - b. Transistor
 - c. Integrated Circuit
 - d. microprocessor

1 pt

- A 19. It is the philosophy that each person should focus exclusively on his or her self-interest.
- a. Ethical Egoism
 - b. Subject Relativism
 - c. Kantianism
 - d. Cultural Relativism

1 pt

- B 20. He argues that without rules and a means of enforcing them, people would not bother to create anything of value, because nobody could be sure of keeping what they created.
- a. John Rawls
 - b. Thomas Hobbes
 - c. Jean-Jacques Rousseau
 - d. Jeremy Bentham

1 pt

- B 21. A right obligating others to do something on your behalf.
- Group of answer choices

- a. Absolute right
- b. Positive right
- c. Negative right
- d. Limited right

1 pt

- D 22. Respect other people and their core values
- a. Divine Ethical Theory
 - b. Divine Command Theory
 - c. Selfish point of view
 - d. Ethical point of view

1 pt

- B 23. What is the main principle of ethical egoism?
- a. The meaning of "right" and "wrong" rests with a society's actual moral guidelines
 - b. the morally right action for a person to take in a particular situation is the action that will provide that person with the maximum long-term benefit
 - c. each person decides right and wrong for himself or herself

1 pt

- D 24. What is the main principle of divine command theory?
- a. the idea that good actions are those aligned with the will of God and bad actions are those contrary to the will of God

1 pt

- A 25. What is the main principle of Cultural relativism?
- a. the idea that good actions are those aligned with the will of God and bad actions are those contrary to the will of God
 - b. the meaning of "right" and "wrong" rests with a society's actual moral guidelines
 - c. the morally right action for a person to take in a particular situation is the action that will provide that person with the maximum long-term benefit
 - d. each person decides right and wrong for himself or herself

1 pt

- B 26. What is the main principle of Subjective relativism?
- a. each person decides right and wrong for himself or herself
 - b. the meaning of "right" and "wrong" rests with a society's actual moral guidelines
 - c. the morally right action for a person to take in a particular situation is the action that will provide that person with the maximum long-term benefit
 - d. the idea that good actions are those aligned with the will of God and bad actions are those contrary to the will of God

1 pt

- A 27. TRUE or FALSE:
Utilitarianism is the name given to the ethical theory of the German philosopher Immanuel Kant.
- a. True
 - b. False

1 pt

- A 28. TRUE or FALSE:
Many of the moral laws Kant describes can also be found in the Bible, Kant's methodology allows these laws to be derived through a reasoning process.
- a. True
 - b. False

1 pt

- A 29. TRUE or FALSE:
Utility is the tendency of an object to produce happiness or prevent unhappiness for an individual or a community.
- a. True
 - b. False

1 pt

- D 30. It is the ethical theory that an action is good if its net effect (overall affected beings) is to produce more happiness than unhappiness.
- a. Rule Utilitarianism
 - b. Virtue Ethics
 - c. Social Contract Theory

1 pt

d. Act utilitarianism

A 31. TRUE or FALSE:

Utilitarianism is also called the Greatest Happiness Principle.

1 pt

- a. True
- b. False

b. False

1 pt

B 32. TRUE or FALSE:

There are two formulations of utilitarianism: moral utilitarianism and rule utilitarianism.

1 pt

- a. True
- b. False

C 33. What is the principle of utility?

1 pt

- a. each person should focus exclusively on his or her self-interest
- b. An action is right (or wrong) to the extent that it increases (or decreases) the total happiness of the affected parties.
- c. "What's right for you may not be right for me."
- d. good actions are those aligned with the will of God and bad actions are those contrary to the will of God

A 34. TRUE or FALSE:

1 pt

Giving money to charity would be considered right in act-utilitarianism, because the money increases the happiness of many people, rather than just yourself.

- a. True
- b. False

A 35. TRUE or FALSE:

1 pt

Rule utilitarianism is the ethical theory that holds that we ought to adopt those moral rules that, if followed by everyone, lead to the greatest increase in total happiness overall affected parties.

- a. True
- b. False

A 36. TRUE or FALSE:

1 pt

Thomas Hobbes is a philosopher that argues that without rules and a means of enforcing them, people would not bother to create anything of value, because nobody could be sure of keeping what they created.

- a. True
- b. False

C 37. What is the principle of Social Contract theory?

1 pt

- a. an action is good if its net effect (overall affected beings) is to produce more happiness than unhappiness.
- b. holds that we ought to adopt those moral rules that, if followed by everyone, lead to the greatest increase in total happiness overall affected parties
- c. "Morality consists in the set of rules, governing how people are to treat one another, that rational people will agree to accept, for their mutual benefit, on the condition that others follow those rules as well."

1 pt

A 38. TRUE or FALSE:

Moral virtues, often called virtues of character by today's writers, are habits or dispositions formed through the repetition of the relevant virtuous actions

- a. True

b. False

1 pt

A 39. TRUE or FALSE:

Virtue ethics is based on the idea that you can count on a good person to do the right thing at the right time in the right way.

Group of answer choices

- a. True
- b. False

A 40. TRUE or FALSE:

1 pt

Relativism is the theory that there are no universal moral norms of right and wrong.

- a. True
- b. False

D 41. It is an association of people organized under a system of rules designed to advance the good of its members over time.

1 pt

- a. none of these
- b. morality
- c. ethics
- d. society

A 42. It is the philosophical study of morality, a rational examination into people's moral beliefs and behavior.

1 pt

- a. Ethics
- b. Society
- c. Morality
- d. Law

D 43. An unsolicited bulk instant message.

1 pt

- a. malware
- b. spam
- c. viruses
- d. Spam

B 44. A piece of self-replicating code embedded within another program called the host.

1 pt

- a. spim
- b. virus
- c. malware
- d. spam

A 45. Any program or file that is harmful to a computer user.

1 pt

- a. malware
- b. spam
- c. bot header
- d. spim

A 46. A self-contained program that spreads through a computer network by exploiting security holes in the computers connected to the network. Group of answer choices

1 pt

- a. worm
- b. spam
- c. bot
- d. spim

D 47. Also known as the "Downadup" worm.

1 pt

- a. spam
- b. conficker
- c. W32
- d. sasser

C 48. A malware which misleads users of its true intent.

1 pt

- a. conflicker
- b. worm
- c. trojan horse
- d. choke

1 pt

D 49. A set of programs that provide privileged access to a computer.

- a. bots
- b. rootkit
- c. worm
- d. spyware

1 pt

C 50. A particular kind of backdoor Trojan that responds to commands sent by a command-and-control program located on an external computer.

- a. Bot
- b. Adware
- c. rootkits footkits
- d. worm

1. A

2. B

3. B

4. B

5. A

6. C

7. C

8. B

9. A

10. D

11. B

12. A

13. C

14. A

15. D

16. C

17. C

18. D

19. A

20. B

21. B

22. D

23. B

24. A

25. B

26. A

27. B

28. A

29. A

30. D

31. A

32. B

33. B

34. A

35. A

36. A

37. C

38. A

39. A

40. A

41. D

42. A

43. D

44. B

45. A

46. A

47. D

48. C

49. D

50. C

Summary: Catalyst for Change

Summary: Catalyst for Change

We are living in the Information Age, an era characterized by ubiquitous computing and communication devices that have made information much easier to collect, transmit, store, and retrieve.

What conclusions can we draw from our study of the development of computers, communication networks, and information storage and retrieval devices?

First, most innovations represent simply the next step in a long staircase of evolutionary changes. Each inventor, or team of inventors, relies upon prior work. In many cases, different inventors come up with the same “original” idea at the same time.

A second conclusion we can draw from these stories is that information technology did not begin with the personal computer and the WorldWideWeb. Many other inventions, including the telegraph, the telephone, the mechanical calculator, the radio, and the television, led to significant social changes when they were adopted.

Finally, with the rise of new technologies come new challenges that test our values. Is it right to give your friends copies of the songs you have purchased? Until music was distributed in digital form and high-bandwidth connections to the Internet became everywhere, this wasn’t a significant issue.

The use of new technology can have a significant impact on society, but we need to remember that, as societies and as individuals, we have a great deal of control over how we choose to use technology in order to maintain the values we hold to be fundamentally important.

Summary: Computer Reliability

Summary

Computers are part of larger systems, and ultimately it is the reliability of the entire system that is important. A well-engineered system can tolerate the malfunction of any single component without failing. This chapter has presented many examples of how the computer turned out to be the “weak link” in the system, leading to a failure. These examples provide important lessons for computer scientists and others involved in the design, implementation, and testing of large systems.

Two sources of failure are data entry errors and data retrieval errors. While it's easy to focus on a particular mistake made by the person entering or retrieving the data, the system is larger than the individual person. For example, in the case of the 2000 general election in Florida, incorrect records in the computer database disqualified thousands of voters. The data entry errors caused the voting system to work incorrectly. Sheila Jackson Stossier was arrested by police who confused her with Shirley Jackson. The data retrieval error caused the criminal justice system to perform incorrectly.

When the topics are software and billing errors, it is easier to identify the system that is failing. For example, when Qwest sent out 14,000 incorrect bills to its cellular phone customers, it's clear that the billing system had failed.

Computer simulations are used to perform numerical experiments that lead to new scientific discoveries and help engineers create better products. For this reason, it is important that simulations provide reliable results. Simulations are validated by comparing predicted results with reality. If a simulation is designed to predict future events, it can be validated by giving it data about the past and asking it to predict the present. Finally, simulations are validated when their results are believed by domain experts and policymakers.

Summary: Introduction to Ethics

Summary: Introduction to Ethics

We live together in communities for our mutual benefit. Every society has guidelines indicating what people are supposed to do in various circumstances. We call these guidelines **morality**. **Ethics**, also called moral philosophy, is a rational examination of people's moral beliefs and behaviors.

In this chapter, we have considered a variety of ethical theories, with the purpose of identifying those that will be of most use to us as we consider the effects of information technology on society.

Relativistic theories are based on the idea that people invent morality. A relativist claims there are no universal moral principles.

Subjective relativism is the theory that morality is an individual creation. Cultural relativism is the idea that each society determines its own morality.

In contrast, **objectivism** is based on the idea that morality has an existence outside the human mind. It is the responsibility of people to discover morality. An objectivist claims there are certain universal moral principles that are true for all people, regardless of their historical or cultural situation.

All of the other theories discussed in this chapter are based on objectivism, including the five most practical theories that we will be using throughout the rest of the book: Kantianism, act utilitarianism, rule utilitarianism, social contract theory, and virtue ethics.

The strengths and weaknesses of these practical theories revealed that each of them contains valuable insight.

According to **Kant**, every human being is equally valuable, and every interaction with another person should respect that person's rationality and autonomy.

Utilitarians understand that it's helpful to consider the consequences of an action when deciding whether it is right or wrong.

Social contract theory focuses on the individual and collective benefits of protecting certain human rights, such as the right to life, liberty, and property.

Virtue ethics is based on the idea that you can count on a good person to do the right thing at the right time in the right way.

Our discussion of these theories also revealed that none of them is perfect. In practice, however, there is no reason why you should not consider virtues and duties and rights and consequences when making moral decisions. If analyses from all of these perspectives result in a consensus on the right course of action, you can make the decision with confidence.

Summary: Network Communication and Intellectual Property

Summary: Network Communication and Intellectual Property

Networking increases the computer's utility. The Internet connects millions of computers, network utility grows as the number of users squared. As people grow, the network may suffer overload and people may act irresponsibly.

Email: Messages embedded in files transferred between computers

Email address: Uniquely identifies cyberspace mailbox

Spam: Unsolicited, bulk email. Spammers seek anonymity and Spam blockers

- Ethical Evaluations of Spamming
 - Kantian evaluation
 - Act utilitarian evaluation
 - Rule utilitarian evaluation
 - Social contract theory evaluation
- Proposed Solutions to Spam Epidemic
 - Require an explicit opt-in of subscribers
 - Require labeling of email advertising (all commercial emails must write ADS on the subject line)
 - Add a cost to every email that is sent for ads. A micropayment system is proposed
 - Ban unsolicited email by-laws (laws to prohibit spam as those laws made to junk faxes)

“Spim” is an unsolicited, bulk instant message.

- Attributes of the Web

- It is decentralized
 - Every Web object has a unique address
 - It is based on the Internet
-
- How We Use the Web
 - Shopping
 - Contributing content (wikis, blogs)
 - Promoting business
 - Learning
 - Exploring our roots
 - Entering virtual worlds
 - Paying taxes
 - Gambling
 - Lots more!
-
- Direct Censorship
 - Government monopolization
 - Prepublication review
 - Licensing and registration
-
- Self-censorship
 - A most common form of censorship
 - Group decides for itself not to publish
-
- Challenges Posed by the Internet
 - Many-to-many communication
 - Dynamic connections
 - Huge numbers of Web sites
 - Extends beyond national borders, laws
 - Can't determine the age of users
-
- Ethical Perspectives on Censorship
 - Kant opposed censorship
 - Mill opposed censorship
-
- Freedom of Expression: History
 - American states adopted bills of rights including freedom of expression
 - Freedom of expression in the 1st amendment to the U.S. Constitution addressed this issue.

- Children and the Web: Web Filters

Web filter: software that prevents the display of certain Web pages

- Chat Room Predators

- Chat room: supports real-time discussions among many people connected to the network

- False Information

- Quality of Web-based information varies widely

- Internet Addiction

Some liken compulsive computer use to pathological gambling

- Contributing Factors to Computer Addiction

- Social factors
 - Situational factors
 - Individual factors

- Intellectual property: any unique product of the human intellect that has commercial value

- Books, songs, movies
 - Paintings, drawings
 - Inventions, chemical formulas, computer programs

- Benefits of Intellectual Property Protection

- Some people are altruistic; some are not
 - The allure of wealth can be an incentive for speculative work.

Limits to Intellectual Property Protection

Society benefits most when inventions in the public domain

Congress has struck a compromise by giving authors and inventors rights for a limited time

Protecting Intellectual Property

Trade secrets

Trademarks and service marks

Patents

Copyrights

Trade Secret

Confidential piece of intellectual property that gives the company a competitive advantage

Trademark

Trademark: Identifies goods

Service Mark

Servicemark: Identifies services

Patent

A public (not secret) document that provides a detailed description of the invention

- Copyright
 - Provides owner of an original work five rights
 - Reproduction
 - Distribution (copies of the work to the public)
 - Public display (copies of the work in public)
 - Public performance
 - Production of derivative works
- Fair Use Concept
 - Sometimes legal to reproduce a copyrighted work without permission
- Digital Recording Technology
 - Copying from vinyl records to cassette tapes introduced hiss and distortions (bad quality)
 - Introduction of the compact disc (CD) a boon for the music industry
- Digital Rights Management
 - Actions owners of digital intellectual property take to protect their rights
- Criticisms of Digital Rights Management
 - Any technological “fix” is bound to fail
 - DRM undermines fair use (no private copy)
 - DRM could reduce competition (never expire)
 - Some schemes make anonymous access impossible
- Peer-to-Peer Networks

- How P2P networks facilitate data exchange
- Napster
 - Peer-to-peer music exchange network
- BitTorrent
 - Broadband connections: download much faster than upload
- Universities Caught in Middle
 - Universities hotbed for file sharing
 - In 2003 RIAA sued four students (for distributing copyrighted music) for about \$100 billion (settled for \$50,000)
- Legal Music Services on the Internet
 - Subscription services for legal downloading (like Napster)
 - Some based on monthly fee; some free
 - Consumers pay for each download
- Software Copyrights
 - Copyright protection began 1964
 - Companies treat source code as a trade secret
- Violations of Software Copyrights
 - Copying
 - Preloading
 - Distributing
- Open Source Definition
 - No restrictions preventing others from selling or giving away software
 - Source code included in the distribution
 - No restrictions preventing others from modifying source code
 - No restrictions regarding how people can use the software. They can exchange or sell.
- Beneficial Consequences of Open-Source Software
 - Gives everyone the opportunity to improve program
 - New versions of programs appear more frequently

- Eliminates tension between obeying the law and helping others
 - Programs belong to the entire community
 - Shifts focus from manufacturing to service
-
- Examples of Open-Source Software
 - BIND – give DNS for the entire Internet
 - Apache – runs half of the Web servers
 - Sendmail – moving e-mail via the internet
 - Perl, Python, Ruby, TCL/TK, PHP, Zope
 - GNU (General Public License) compilers for C, C++, Objective-C, Fortran, Java, and Ada
-
- Impact of Open-Source Software
 - Linux putting pressure on companies selling proprietary versions of Unix
 - Linux putting pressure on Microsoft and Apple desktops
 - The cost for these OSs goes down
-
- The legitimacy of Intellectual Property Protection for Software
 - Software licenses typically prevent you from making copies of the software to sell or give away
 - Software licenses are legal agreements
 - Here we are not discussing the morality of breaking the law
 - We are discussing whether society should give intellectual property protection to software utilitarian analysis