COMPUTING AND SOCIETY

William .K. Korir
The African Virtual University (AVU) is proud to participate in increasing access to education in African countries through the production of quality learning materials. We are also proud to contribute to global knowledge as our Open Educational Resources are mostly accessed from outside the African continent.

This module was developed as part of a diploma and degree program in Applied Computer Science, in collaboration with 18 African partner institutions from 16 countries. A total of 156 modules were developed or translated to ensure availability in English, French and Portuguese. These modules have also been made available as open education resources (OER) on oer.avu.org.

On behalf of the African Virtual University and our patron, our partner institutions, the African Development Bank, I invite you to use this module in your institution, for your own education, to share it as widely as possible and to participate actively in the AVU communities of practice of your interest. We are committed to be on the frontline of developing and sharing Open Educational Resources.

The African Virtual University (AVU) is a Pan African Intergovernmental Organization established by charter with the mandate of significantly increasing access to quality higher education and training through the innovative use of information communication technologies. A Charter, establishing the AVU as an Intergovernmental Organization, has been signed so far by nineteen (19) African Governments - Kenya, Senegal, Mauritania, Mali, Cote d’Ivoire, Tanzania, Mozambique, Democratic Republic of Congo, Benin, Ghana, Republic of Guinea, Burkina Faso, Niger, South Sudan, Sudan, The Gambia, Guinea-Bissau, Ethiopia and Cape Verde.

The following institutions participated in the Applied Computer Science Program: (1) Université d’Abomey Calavi in Benin; (2) Université de Ouagadougou in Burkina Faso; (3) Université Lumière de Bujumbura in Burundi; (4) Université de Douala in Cameroon; (5) Université de Nouakchott in Mauritania; (6) Université Gaston Berger in Senegal; (7) Université des Sciences, des Techniques et Technologies de Bamako in Mali; (8) Ghana Institute of Management and Public Administration; (9) Kwame Nkrumah University of Science and Technology in Ghana; (10) Kenyatta University in Kenya; (11) Egerton University in Kenya; (12) Addis Ababa University in Ethiopia; (13) University of Rwanda; (14) University of Dar es Salaam in Tanzania; (15) Université Abdou Moumouni de Niamey in Niger; (16) Université Cheikh Anta Diop in Senegal; (17) Universidade Pedagógica in Mozambique; and (18) The University of the Gambia in The Gambia.

Bakary Diallo
The Rector
African Virtual University
Production Credits

Author
William Korir

Peer Reviewer
William Korir

AVU - Academic Coordination
Dr. Marilena Cabral

Overall Coordinator Applied Computer Science Program
 Prof Tim Mwololo Waema

Module Coordinator
Karen Ferreira

Instructional Designers
Elizabeth Mbasu
Benta Ochola
Diana Tuel

Media Team
Sidney McGregor  Michal Abigael Koyier
Barry Savala  Mercy Tabi Ojwang
Edwin Kiprono  Josiah Mutsogu
Kelvin Muriithi  Kefa Murimi
Victor Oluoch Otieno  Gerisson Mulongo
Copyright Notice

This document is published under the conditions of the Creative Commons Attribution http://creativecommons.org/licenses/by/2.5/

Module Template is copyright African Virtual University licensed under a Creative Commons Attribution-ShareAlike 4.0 International License. CC-BY, SA

Supported By

AVU Multinational Project II funded by the African Development Bank.
# Table of Contents

**Foreword** 2  
**Production Credits** 3  
**Copyright Notice** 4  
**Supported By** 4  
**Course Overview** 10  
  - Prerequisites .................................................. 10  
  - Materials ....................................................... 10  
  - Unit Goals ..................................................... 10  
  - Course Units .................................................. 11  
**Assessment** ..................................................... 11  
**Schedule** ....................................................... 12  
**Readings and Other Resources** 13  
**Unit 0. Pre-Assessment** 16  
  - Unit Introduction ............................................. 16  
  - Unit Objectives .............................................. 16  
  - Key Terms ..................................................... 16  
  - Learning activities ......................................... 17  
    - Learning Activity 0.1 (Exploratory) ................. 17  
  - Learning Activity 0.2 Printer and printing .......... 17  
  - Conclusion ................................................. 18  
  - Learning Activity 0.3 (Internet search) ............ 18  
    - Conclusion .............................................. 18  
  - Unit Assessment .......................................... 19  
**Grading Scheme** 23
Unit Readings and Other Resources ........................................... 24

**Unit 1. History of computing and Information systems** .......................... 25

  Unit Introduction .......................................................... 25

  Unit Objectives ........................................................... 25

  Key Terms ........................................................................ 25

  Introduction ...................................................................... 28

  Learning Activities ......................................................... 31

  Activity 1.1 - Exploratory- listing of information systems [Expected time 12 hours] .................................................. 31

  Conclusion ........................................................................ 31

  Activity 1.2: Reading and Internet search - Characteristics and classification of systems information [Expected time 6 hours] .................................................. 31

  Conclusion ........................................................................ 32

  Activity 1.3 - Reading and Internet research [Expected time 12 hours] .................................................. 32

  Conclusion ........................................................................ 32

  Unit Assessment .............................................................. 33

  Instructions ...................................................................... 33

  Conclusion ........................................................................ 34

  Grading Scheme .................................................................. 34

  Feedback ........................................................................... 34

  References ......................................................................... 35

**Unit 2. Contemporary computing and its impact on everyday life** ............ 36

  Unit Introduction .............................................................. 36
Unit Objectives ............................................. 36
Key Terms .................................................... 38
Learning Activities ................................. 39

Introduction 39

Activity 2.1 - Internet/book reading, research

[Expected time of completion: 10 hours] ............................................ 40

Activity Details 40

Activity 2.2 - Internet/book reading, research

[Expected time of completion: 21 hours] ............................................. 40

Activity 2.3: Exploratory [Expected time of completion: 10 hours]

Assessment ............................................. 41

Unit Assessment ............................................. 41

Grading Scheme 42

Feedback ................................................. 42

Unit Readings and Other Resources ............................................... 42

Main Readings 42

Optional readings and other resources: 43

Unit 3. Professional Computing, Ethics and Society 44

Unit Introduction ............................................. 44

Unit Objectives ............................................. 44

Key Terms ................................................. 45

Computer Ethics ............................................. 47

Property rights and law 48
Introduction

Activity Details

Learning Activity 3.1 (exploratory)

[Estimated time 4 hours]

Conclusion

Assessment

Activity 3.2 - Research/discussion/report writing

/tutorials [estimated 6 hours]

Introduction

Activity Details

Activity 3.3 - Research/discussion/report writing

writing/tutorials

Introduction

Conclusion

Assessment

Unit Assessment

Instructions

Grading Scheme

Feedback

Unit Readings and Other Resources

Internet materials

Course Summary

Course Assessment
Course Overview

The primary goal of the course is to develop computer professionals able to explore the implications of what computing professionals create as part of their work and how this impacts society at large. It will help the learner to understand the development, application and consequences of computing technology in relation to society.

In this course, you will learn about the history of computing; principles, concepts and terminology of computing, software uses, application and development; role of computing professionals; current computing technologies and their use in everyday life, examination of variety of computing perspectives such as access to information, privacy, computer security, virtual society, transformation of work and workplace; social, ethical and legal issues and their implications to computing in our daily lives as a society; professional aspects of computing.

Prerequisites

The prerequisite for this unit is basic computing applications skills such as being able to start a computer, shut the computer, word processing, spreadsheet skills, internet use for searching, e-mails, use various input/output devices such as web camera, scanners, and the like.

Materials

The materials to be used include

- Listed books for each unit
- Listed Internet materials sources and the learner’s own Internet search
- Primary data collection from individuals/organizations/businesses

Unit Goals

- Describe a variety of computing issues including historical, professional, cultural, legal and ethical aspects.
- Identify areas of society where computing has had significant impact.
- Identify the societal concerns that have emerged from the use of computing software.
- Explain how different aspects of computing may contribute to the choice of development and use of computing technology.
- Describe the legal, ethical and social issues associated with the use of computing tools by individuals/businesses/society/organizations.
- Contribute to the discussion of the choice, use and development of computing software.
- Explain how the choice and development of computing software will affect the society.
- Explain how the use of computing software will affect the society.
Course Units

Unit 0: Pre-Assessment

This unit is a diagnostic assessment of what you already know about basic computing and is to prepare you for the other units which will involve more concepts/surveys and research on the computing applications which the society uses or has used before.

Unit 1: History of computing and Information systems

This unit will provide a survey of how computing is used and how it relates to society. It gives the history of computing and information systems, components of computing devices, characteristics of information systems that are in use by organizations. The unit will also give an overview of how to implement and manage an information for organizations or individuals.

Unit 2: Current computing technologies and their impact to everyday life

This unit will be used to describe some of the terminologies that are used in contemporary computing technologies including the Internet, mobile computing, web technologies, cloud computing, tools of the Internet such as social media, various classes of social media, uses of these technologies by individuals/society/organizations. Benefits of using the technologies and their impact on individuals/society/organizations will also be given. The unit will also attempt to provide various ways of managing these technologies.

Unit 3: Professional Computing, law, ethics and society

This unit deals with legal, social, and ethical issues surrounding use of computing tools, software and development of applications that individuals/society/organizations often come into contact. The unit will stress ethical decision-making as well as legal and social responsibility in connection with technology-related concerns. Issues such as security, crime, privacy and intellectual property will be examined in the context of computing.

Assessment

Each activity covered will conclude with quizzes, homework exercises, individual research assignments or simple projects.

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>3 end of unit assignments of varying weights and complexity. Units will have different assessment marks.</td>
</tr>
<tr>
<td>2</td>
<td>mid semester written exam</td>
</tr>
<tr>
<td>3</td>
<td>1 final written exam</td>
</tr>
<tr>
<td></td>
<td>TOTAL</td>
</tr>
</tbody>
</table>
## Schedule

The activities within each unit will have varying estimated times of completion and this will be indicated for each activity.

<table>
<thead>
<tr>
<th>Unit</th>
<th>Activity</th>
<th>Estimated Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unit 0- Pre assessment</td>
<td>Learning Activity 0.1 (Exploratory)</td>
<td>2 hours</td>
</tr>
<tr>
<td></td>
<td>Learning Activity 0.2 (Printer and printing)</td>
<td>2 hours</td>
</tr>
<tr>
<td></td>
<td>Learning Activity 0.3 (Internet search)</td>
<td>2 hours</td>
</tr>
<tr>
<td></td>
<td>Unit Assessment</td>
<td>2 hours</td>
</tr>
<tr>
<td>Unit 1- History and Information systems</td>
<td>Learning activity 1.1</td>
<td>12 hours</td>
</tr>
<tr>
<td></td>
<td>Learning activity 1.2</td>
<td>6 hours</td>
</tr>
<tr>
<td></td>
<td>Learning activity 1.3</td>
<td>12 hours</td>
</tr>
<tr>
<td></td>
<td>Unit assessment part one</td>
<td>5 hours</td>
</tr>
<tr>
<td></td>
<td>Unit assessment part Two A</td>
<td>4 hours</td>
</tr>
<tr>
<td></td>
<td>Unit assessment part Two B</td>
<td>4 hours</td>
</tr>
<tr>
<td>Unit 2- Current Computing Technologies and their impact to everyday life</td>
<td>Learning activity 2.1</td>
<td>10 hours</td>
</tr>
<tr>
<td></td>
<td>Learning activity 2.2</td>
<td>21 hours</td>
</tr>
<tr>
<td></td>
<td>Learning activity 2.3</td>
<td>10 hours</td>
</tr>
<tr>
<td>Unit 3- Professional Computing, law, ethics and society</td>
<td>Learning activity 3.1</td>
<td>4 hours</td>
</tr>
<tr>
<td></td>
<td>Learning activity 3.2</td>
<td>6 hours</td>
</tr>
<tr>
<td></td>
<td>Learning activity 3.3</td>
<td>6 hours</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>120 hours</td>
</tr>
</tbody>
</table>
Readings and Other Resources

The readings and other resources in this course are:

Unit 0- Pre-Assessment

- [http://www.tutorialspoint.com/computer_fundamentals/](http://www.tutorialspoint.com/computer_fundamentals) computer fundamentals
- [http://uwf.edu/clemley/cgs1570w/notes/01%20-%20intro_to_computer.htm - Essential Introduction to computers](http://uwf.edu/clemley/cgs1570w/notes/01%20-%20intro_to_computer.htm - Essential Introduction to computers)

Unit 1- History of computing and Information systems

Required readings and other resources:


Websites

You will find useful information on the Internet sites of major international institutions: the OECD, the World Bank, the UNDP, the ITU. ([http://www.itu.int/ITU-D/index.html](http://www.itu.int/ITU-D/index.html))

Also, you can find a lot of relevant material at:

- [http://www.crito.uci.edu/publications](http://www.crito.uci.edu/publications) and the University of Manchester site
Unit 2- Current computing technologies and their impact to everyday life

Required readings and other resources:

(Download free eBooks at bookboon.com)

- Email marketing @2011. The Internet Marketing Academy & bookboon ISBN 978-87-7681-910-1

Optional readings and other resources:

Internet materials

- https://www.facebook.com/business/overview-How to Use Facebook for Business Marketing | Facebook for ...
- http://www.rmgnetworks.com/blog/bid/354229/4-tips-on-using-Twitter-for-internal-communication - 4 tips on using Twitter for internal communication
- http://thenextweb.com/socialmedia/2014/07/19/emotional-involvement-behind-social-media-interactions/- The emotional involvement behind social media interactions
Unit 3- Professional Computing, law, ethics and society

Required readings and other resources

1. ACM Code of Ethics and Professional Conduct [http://www.acm.org/about/code-of-ethics](http://www.acm.org/about/code-of-ethics)

2. Software Engineering Code of Ethics and Professional Practice - [http://www.acm.org/about/se-code](http://www.acm.org/about/se-code)


Unit 0. Pre-Assessment

Unit Introduction

The purpose of this unit is to determine your grasp of knowledge related to this course. You will jog your memory to establish if some terms are familiar to you and whether you can use some computer tools. You will be expected to answer simple quizzes which are of purely diagnostic nature and do not have any marks associated with them.

Unit Objectives

Upon completion of this unit you should be able to:

- Establish if you are able to operate computer hardware,
- use application software,
- use online learning material,
- apply skills learned through assessments

Key Terms

A computer application: is a type of software that allows you to perform specific tasks.

Computer hardware: Computer hardware is the collection of physical parts of a computer system. This includes the computer case, monitor, keyboard, and mouse. It also includes all the parts inside the computer case, such as the hard disk drive, motherboard, video card, and many others.

Computer software (often called just software) is made of one or more computer programs. Sometimes it means one specific program, or it can mean all the software on a computer, including the applications and the operating system. Applications are programs that do a specific thing, such as a game or a word processor.

A peripheral device is generally defined as any auxiliary device such as a computer mouse or keyboard that connects to and works with the computer in some way. Other examples of peripherals are image scanners, tape drives, microphones, loudspeakers, webcams, and digital cameras.
Learning activities

Learning Activity 0.1 (Exploratory)

In this activity, you are to use your computer to perform some tasks which will gauge if you can successfully use a computer and you will also learn a number of things. It would be important to spend some time about 1 hour, to read chapter one of [http://uwf.edu/clemley/cgs1570w/notes/01%20-%20intro_to_computer.htm](http://uwf.edu/clemley/cgs1570w/notes/01%20-%20intro_to_computer.htm) Essential introduction to computers before doing this activity.

Locate the button for switching off/on the computer and switch on the computer.

1. Locate the port for the mouse and connect the mouse, name the type of the mouse (PS2 or USB port)
2. How many USB ports does your computer have?
3. Can you locate the printer port and network interface card port?
4. Locate the CD/DVD drive
5. Go to “My computer”, right click, select properties and specify the following specifications
   - Manufacturer
   - Rating
   - Processor
   - Installed memory
   - System type
6. Go to “My computer”, right click, properties and then select device manager then list the devices your machine can support.

Learning Activity 0.2 Printer and printing

1. Use MS Word to create a document “my learning activity”. Type some few sentences and imagine that the document will be printed.
2. Connect your computer to the printer, (did you get the printer port?)
3. What printer setup instructions did you follow?
4. If you wanted to print the document what page setup options are available to you? Can you describe the page layout for each case?
5. Imagine that you are to send the document to your instructor using e-mail. Create an e-mail address using Gmail. It is free. Send the document to one of your friends or your instructor.
   - How did you ensure the document is part of the mail?
   - If you go to sent mails, is your mail included as of those sent by you?
Conclusion

The printer must be accessible to the computer that wants to use it to print its work. Some printers are directly connected to the computer while others are network printers. One must know the steps needed to access the printer. E-mail is another application that supports distribution of documents. A single document can be sent to many people whose email addresses must be known and be included in the list of recipients.

Learning Activity 0.3 (Internet search)

Before participating in this activity, learners are asked to spend some time, about 1 hour, to read http://uwf.edu/clemley/cgs1570w/notes/01%20-%2002intro_to_computer.htm - Essential Introduction to computers, chapter 2. This is to assist you to get to know what the Internet is all about and how to use the Internet. You will also get to know that there are so much that you can do with the Internet apart from looking for information.

In this activity, you will try to demonstrate that you can use the Internet to get materials relevant to some topics. The Internet uses search engines depending on browser. The computer must have a network card and a port where it connects to the motherboard. Some computers use a wireless connection while others must be wired.

Open your browser

1. Type https://www.google.com/
2. Search for the keywords “introduction to the Internet”
3. What do you see?
4. Type something else like “social media”
5. What do you see?
6. Type anything that may be of interest to you and see if you can find materials about it.
7. What makes the Internet work?
8. Who pays for the Internet services?

Conclusion

The Internet is a useful tool for research and any materials that you may wish to look for can be found in the Internet. You must, however, know the keywords of the information you are looking for.
Unit Assessment

Instructions

PART ONE

Check your understanding!

1. What do you call the space where the computer does its processing?
   A: CPU
   B: RAM
   C: OS

2. What is it called when you remove some information from a file or remove a file from the disk?
   A: Save
   B: Edit
   C: Delete

3. What kind of a file is the kind that we care about most (memos, letters, pictures, etc.)?
   A: Application File
   B: Document Files
   C: System Files

4. Using the desktop metaphor, what is the hard drive (and other kinds of storage media like floppy disks)?
   A: File Cabinet
   B: Application Files
   C: Desktop

5. What do you do to get rid of a window that you’ve opened?
   A: Delete
   B: Trash
   C: Close

6. What do you do when you make changes to a document?
   A: Drag
   B: Click
   C: Edit
7. What menu command do you use to give a file a name and a place to live?
   A: Save
   B: Save As
   C: Creating A File

8. What is the cool technical name for devices that hold files and folders?
   A: Documents
   B: Folders
   C: Volumes

9. Where do you move icons when you want to get rid of or delete them?
   A: Recycle Bin or Trash
   B: Document Files
   C: Folders

10. What do we call those small, pictorial representations of objects we see on the desktop?
    A: Icons
    B: List View
    C: File menu

11. What can we create, rename and move around that allows us to sort out and organize our files?
    A: Resize Box
    B: System Files
    C: Directories or Folders

12. What do we call it when you “loose” all the work you’ve done since the last time you saved?
    A: Crash
    B: Close
    C: Recycle Bin

13. What do we call pressing the mouse button twice in rapid succession?
    A: Double Click
    B: Right Click
    C: Click
14. What do we call keys that change the meaning of what you type?
   A: Keyboard
   B: Modifier Keys
   C: Disk Space

15. What view in a windows arranges the icons (often by name, but you can sort in other ways) and shows more information about them?
   A: Menu
   B: List View
   C: Icon View

16. What do we call the main chip of the computer that makes everything go or the box that holds the guts of the computer?
   A: CPU
   B: Megabytes
   C: Operating System

17. What part of a window that allows you to move through documents?
   A: Mouse
   B: Keyboard
   C: Scroll Bar

18. What menu command allows you to go back to a document you’ve already worked on?
   A: Save
   B: Open
   C: Save As

19. What is a synonym for “Opening” a program application?
   A: Delete
   B: Drag
   C: Launch

20. What is the name of the most widely used operating system for personal computers?
   A: Macintosh
   B: UNIX
   C: Windows
21. Which way should the “tail” of the mouse point when you use it?
   A: To the right
   B: Away from your body
   C: Toward the ground

22. What do we call the part of the screen you can click on which displays a list of commands?
   A: A Menu
   B: Some Documents
   C: The Computer

23. What do we call the basic software that allows your computer to work?
   A: File Cabinet
   B: System Files
   C: Application Files

24. What do we call moving an object on screen with the mouse?
   A: Double Click
   B: Click
   C: Press and Drag

PART TWO

1. Attempt to answer the following questions, it would be prudent to search for possible answers by reading the materials listed for this unit. The expected answers will be given in the feedback section.

2. What software do you use to create a document that will make use of slides?

3. What is the tool used for checking spelling of text?

4. In what way has the computer assisted you to perform row wise arithmetic in a document?

5. How has computer storage capacity and speed changed the way people store and process data? Reliable and efficient

6. What are the advantages and disadvantages of using computing technology?

7. Which computer applications are used for word processing, data analysis, data storage?

8. How has e-mail assisted in document distribution?
9. Why is it important to use user login and password when using a computer in a network?

10. What do you understand by a computer virus?

11. What is the importance of an antivirus?

**Grading Scheme**

There are no marks for this assessment.

**Feedback**

**PART ONE**

For part one, check your understanding by visiting the link below for the expected answers to the questions in part one.


**PART TWO: EXPECTED ANSWERS**

1. What software do you use to create a document that will make use of slides?  
   Answer: - PowerPoint

2. What is the tool used for checking spelling of text?  
   Answer: Spell checker

3. In what way has the computer assisted you to perform row wise arithmetic in a document?  
   Answer Consistent and accurate

4. How has computer storage capacity and speed changed the way people store and process data?  
   Answer: Reliable and efficient

5. What are the advantages and disadvantages of using computing technology?  
   Answer. Advantage: Reliable, fast, accurate, durable, sharable etc.  
   Disadvantages: Variable to attack. i.e. virus, hackers, system failure etc.

6. Which computer applications are used for word processing, data analysis, data storage?  
   Answer Word processors, excel and database management systems

7. How has e-mail assisted in document distribution?  
   Answer sending to group of people globally, fast and effectively

8. Why is it important to use user login and password when using a computer in a network?  
   Answer Authentication improve integrity, privacy, system confidentiality

9. What do you understand by a computer virus?  
   Answer Program which affect and interfere with normal operation of system.
Give us your suggestions and/or recommendations on how this unit’s content can be improved.

**Unit Readings and Other Resources**

The readings in this unit are to be found at the course-level section “Readings and Other Resources”

- [http://www.tutorialspoint.com/computer_fundamentals/](http://www.tutorialspoint.com/computer_fundamentals) - Computer fundamentals
- [http://uwf.edu/clemley/cgs1570w/index.htm](http://uwf.edu/clemley/cgs1570w/index.htm) - CGS 170W - Computer concepts and Applications (and choose site map and select Notes section 6.0 Essentials introduction to computers)
- [http://uwf.edu/clemley/cgs1570w/notes/01%20-%20intro_to_computer.htm](http://uwf.edu/clemley/cgs1570w/notes/01%20-%20intro_to_computer.htm) - Essential Introduction to computers
Unit 1. History of computing and Information systems

Unit Introduction

In this unit, you will learn how computing and information systems are used and how they relate to society. You will also explore the history of computing and information systems and characteristics of information systems that are in use by organizations. The unit will also give you an overview of where information systems are used by organizations.

Unit Objectives

Upon completion of this unit the learner should be able to:

- List information systems that are used by organizations.
- Explain the characteristics of information systems.
- Explain how information systems have been utilized by individuals or organizations.
- Discuss the type of information systems used by organizations.

Key Terms

An information system (IS): This is a system composed of people and computers that processes or interprets information. The term is also sometimes used in more restricted senses to refer to only the software used to run a computerized database or to refer to only a computer system.

Complex instruction set computing (CISC): This is a CPU design where single instructions can execute several low-level operations (such as a load from memory, an arithmetic operation, and a memory store) or are capable of multi-step operations or addressing modes within single instructions.

Reduced instruction set computing (RISC): This is a CPU design strategy based on the insight that simplified instruction set provides higher performance when combined with a microprocessor architecture capable of executing those instructions using fewer microprocessor cycles per instruction.
**System software** (systems software): This is a computer software designed to operate and control the computer hardware and to provide a platform for running application software. System software can be separated into two different categories, operating systems and utility software.

A **peripheral**: is a “device that is used to put information into or get information out of the computer.” There are three different types of peripherals: Input, used to interact with, or send data to the computer (mouse, keyboards, etc.). Other examples of peripherals are expansion cards, graphics cards, image scanners, tape drives, microphones, loudspeakers, webcams, and digital cameras.

**Operating system**: This is the software that supports a computer’s basic functions, such as scheduling tasks, executing applications, and controlling peripherals.

**Application software**: This is a set of one or more programs designed to carry out operations for a specific application. Application software cannot run on its own and is dependent on system software to execute.

**Communications network**: A set of locations, or nodes, consisting of hardware, programs, and information linked together as a system that transmits and receives data and information.

**Information technology**: This is the application of computers and telecommunications equipment to store, retrieve, transmit and manipulate data, often in the context of a business or other enterprise.

**Networked operating system**: This is an operating system which includes software to communicate with other computers via a network. This allows resources such as files, application programs, and printers to be shared between computers.

A **standalone program**: This is a computer program that does not load any external module, library function, or program and that is designed to boot with the bootstrap procedure of the target processor.
A **mobile application**: This is a software application that works on a specific mobile device’s operating system and is downloaded to the device to perform a specific set of functions. Apps can also be device-specific such as iPhone and iPad apps.

An **enterprise application**: This is a business application, obviously. As most people use the term, it is a big business application. In today’s corporate environment, enterprise applications are complex, scalable, distributed, component-based, and mission-critical.

**Information and communication technologies**: Stresses the role of unified communications and the integration of telecommunications (telephone lines and wireless signals), computers as well as necessary enterprise software, middleware, storage, and audio-visual systems, which enable users to access, store, transmit, and manipulate information.

**Enterprise Resource Planning** (ERP): A process by which a company (often a manufacturer) manages and integrates the important parts of its business.

An **ERP** management information system integrates areas such as planning, purchasing, inventory, sales, marketing, finance, human resources.

A **Database Management System**: This is a collection of programs that enables you to store, modify, and extract information from a database.

**Custom software**: This is a computer program or Website written specifically for your company, according to your company’s way of doing business. The opposite of custom software is off-the-shelf software, also known as pre-packaged or pre-written software.

**Computer Applications Technology**: This is the study of the integrated components of a computer system (hardware and software) and the practical techniques for their efficient use and application to solve everyday problems.
**Computer technology:** Refers to the design, construction and programming of computers. This broad definition encompasses a few major areas such as hardware, software and networking.

**Network technologies:** Network technologies include various network technologies to facilitate the management and dissemination of digital data from one point to another.

**Internet technologies:** These are defined as a set of related and interconnected technologies which enable the establishment of global networks, for various purposes such as collaboration, electronic data interchange, electronic commerce, electronic communication and social networking.

**Hyper Text Markup Language** (HTML): HTML is a markup language for describing web documents (web pages)

**Hypertext Transfer Protocol** (HTTP): The Hypertext Transfer Protocol (HTTP) is protocol for distributed, collaborative, hypermedia information systems.

**Cascading Style Sheets** (CSS): CSS Describes how HTML elements are to be displayed on screen, paper, or in other media

**Introduction**

Computing, is defined as the use or operation of computers or defined as the process of using computer technology to complete a task. An information system is the process of and tools for storing, using, gathering and managing of data and communications in an organization. Computing and information systems have a long history and have been evolving as a result of new trends in technological advancement. Computing devices used to be large but now there are many small gadgets capable of running various applications. There were stand alone computing systems, later became networked, then web based and now mobile systems. The current devices have very fast speeds of processing information alongside the capability of storing large amounts of information.

There are various applications and systems that have been developed to be used by organizations, individuals and society. Application software are those programs that are designed to be used to perform for specific tasks for users. It can be a productivity or business tool designed to enhance how people perform their day today tasks. They include such applications as word processing that have made document creation and management easy. They have spell checkers, graphics, clip art, search and replace, footers and headers, paging,
table of contents, etc. There are spreadsheet applications used for data analysis. You can easily use formulae to analyse data, draw graphs, perform computations etc. There are database management applications which allow you to organize data for efficient interrogation and retrieval. There also presentation application that allows users to create presentations that communicate ideas, messages, and other information to a group through a slide show. Presentations can be enhanced by using clip gallery, clip art images, pictures, audio and video clips. There are many others like the calendar, schedule, etc. Some of these are sold as a collection of applications known as a suite, like the MS office.

There are other applications that can do a lot more and are known as systems. For example, a school management system is developed to make it easy to manage student and staff information, school inventory, fees payments, examinations, sharing of school information with stakeholders such as parents, government, examination bodies, and others. Such systems are developed with the involvement of potential users and the software developers and the sponsors. The functionalities of such systems are normally constrained by the existing technology. It is for this reason that different systems have been in use over time and tend to reflect the stages of the computing technologies at the time of their development and/or use.

In the order of their development these systems may be largely grouped as follows

**Standalone computer system**

A desktop or laptop computer that is used on its own without requiring a connection to a local area network (LAN) or wide area network (WAN). Although it may be connected to a network, it is still a stand-alone PC as long as the network connection is not mandatory for its general use. Also standalone computer can be connected through terminals to access one main computer referred as mainframe.

**Networked Information Systems (NIS).**

These are systems that are running in a local area network where the overall goal is to provide an environment for users to access centralized data and there exists user authentication and control. The NIS uses a client/server model and there is a remote communication interface for communication. NIS has a server, a library of client programs, and some administrative tools. A Network application is any application running on one host and provides a communication to another application running on a different host, the application may use an existing application layer protocols such as: HTTP, SMTP. and may be the application does not use any existing protocols and depends on the socket. A network socket is an endpoint of an inter-process communication flow across a computer network. Today, most communication between computers is based on the Internet Protocol; therefore most network sockets are Internet sockets and inter processes communication.

**Web based information system**

A web information system is an information system that can be accessed through world wide web (www) and a web application or web application is any software that runs in a web browser. It is created in a browser-supported programming language (such as the combination of JavaScript, HTML, HTTP and CSS) and relies on a web browser to render the application. You run these applications from anywhere so long as you are connected to the Internet. The web
brings database information to be available to the world. There is a very good support for multimedia objects in the web applications or web systems. A web information system is being a web enabled software system whose main purpose is to publish and maintain large amounts of data, and uses web browsing oriented interface that supports context dependent navigation and publishes content on web pages. Web technology includes web sites, web pages, web based intranet and internet information systems and the web based content that is contained therein.

The data is stored by means of a Database Management System (DBMS) technology and the databases may be heterogeneous, distributed and/or pre existing web application. Some examples are:

- Content oriented web based information systems such as online newspapers, digital libraries
- Service oriented web based information systems such as order tracking systems, hotel reservation systems,
- Community oriented systems such as portals, message boards, etc.
- Commerce oriented information systems such as virtual marketplaces, online auctions, electronic catalogues, product selection where a range of available products is taken from a production database; pricing information were presented prices are the same as those in the accounting database; online ordering and delivery where orders are used to steer production and inform direct delivery; sales support where documentation (updates) and problem reports are handled through the web

Cloud computing: Cloud computing is a general term for the delivery of hosted services over the Internet.

Mobile Information systems

These are information systems in which access to information resources and services is through end user terminals that can be moved easily in space, are location independent, and typically provided through wireless connection. A mobile application, most commonly referred to as an app, is a type of application software designed to run on a mobile device, such as a smartphone or tablet computer. Mobile applications frequently serve to provide users with similar services to those accessed on PCs. Your smartphone has the power to run all kinds of programs, from games to productivity tools, from live TV streams to travel guides. In this type of information systems, the information, services and user interfaces may vary and often depend on the context of the use of the system. Mobile devices often have small screens, support limited interactions (input), supports limited bandwidth, has limited computational resources and availability because of use of batteries. Often tasks are fragmented into small specific applications such as Facebook, Twitter, Skype, Blogs, Chats system, Google Plus, Google drives, YouTube and many others. Each of these perform its own task for a user.
Mobile input methods may be

- Text based navigation for screen based systems
- Hands free voice interfaces
- Digital pen and paper based user interfaces
- Use of camera image to drive intervention
- Combination of the above to achieve a specific task.

Learning Activities

Activity 1.1 - Exploratory - listing of information systems [Expected time 12 hours]

Before doing this activity, visit http://uwf.edu/clemley/cgs1570w/index.htm -CGS 170W- Computer concepts and Applications (and choose site map and select Notes section 6.0 Esssential introduction to computers ) and read chapter 3. You may also use the Internet to search for names of information systems or applications if not already known.

In this activity, are to put yourselves in groups of two and visit one or two individuals or two businesses, two organizations or two societies, and list information systems or applications which are in use by those individuals, organizations, businesses and/or societies. Include in your answer how these information systems are of assistance to them.

Prepare a report on this and send it to your instructor using the contacts provided.

Conclusion

There are different applications/systems used by individuals/organizations/society/businesses depending on what tasks they want to perform.

Activity 1.2: Reading and Internet search - Characteristics and classification of systems information [Expected time 6 hours]

Before doing this activity, visit http://uwf.edu/clemley/cgs1570w/index.htm -CGS 170W- Computer concepts and Applications (and choose site map and select Notes section 6.0 Esssential introduction to computers ) and read chapter 3. You may also use the Internet to search for names of information systems or applications if not already known.

In this activity, you are required to identify characteristics of information systems listed in activity 1.1 under the following categories, it is necessary to use a table to show the classifications and the characteristics of the information systems.

Standalone computer system

- Networked Information Systems (NIS).
- Web based information system
• Mobile Information systems
• Prepare a report of your findings and send to the instructor using contacts provided.

Conclusion
Applications or systems have different characteristics depending on the level of technology available at the time of their development and the kind of usage they are put to.

Activity 1.3 - Reading and Internet research [Expected time 12 hours]
In this activity, choose any three applications from the list below and prepare at least two pages on how they are used by individuals, organizations, businesses, society.

Twitter
Inventory control system
School management system
Facebook
Microsoft Word/Excel
Database system
LinkedIn
Google shared drive

Prepare a report on this and send it to your instructor using the contacts provided. The report should include the following issues are addressed.

accessibility,
Accuracy
Simplicity
Flexibility
Security

Conclusion
This activity enabled you to understand the different application systems used by individuals, organizations, businesses and society.
Unit Assessment

PART ONE [5 hours]

List at least seven information systems presently used in various organizations in your country to manage their business activities as given below. At least one information system for each activity is expected. It may require that you do some research to get the expected answers.

Schools
Banks
Hospitals
Cooperative business
Supermarkets
Universities
Enterprises

Instructions

You are to prepare a report and send to your who will be mark as part of your assessment and grade

PART TWO

List at least three examples of each of the following types of information systems: [4 hours]

Stand alone
Networked
Web based
Mobile
Interactive web based

Instructions

You are to prepare a report and send to your who will be mark as part of your assessment and grade

List roles of the following information system personnel [4 hours]

System administrator
System analyst
Technician
Network administrator
Conclusion

There are different types of information systems and applications. Their usage varies and depends largely on the needs of the users. Some are simple types, while others are complex and are used to manage large amounts of data and involve many users who also need to be managed to protect the data in terms consistency and integrity.

Summary

You have learnt various information systems, their characteristics and application areas. The unit has enabled you to analyses, compare and explain the utilization of information systems by individuals/organizations/businesses. You can now contribute to any discussion on information systems implementation and management, computing principles, uses, challenges, current technological trends and needs of individuals/organizations/businesses.

Grading Scheme

Unit Assessment Report - 4 %
Learning activities reports -3 %

Feedback

You can check the answers in the materials listed for this unit.
References

The readings in this unit are to be found at course level readings and other resources.

Unit readings and other resources

http://www.tutorialspoint.com/computer_fundamentals/index.htm - Computer Components

http://www.contentedwriter.com/p1-explain-the-function-of-computer-hardware-components/ - Explain the functions of computer hardware.

http://uwf.edu/clemley/cgs1570w/index.htm - CGS 170W - Computer concepts and Applications (and choose site map and select Notes section 6.0 Essential introduction to computers ) and read chapter 3


Unit 2. Contemporary computing and its impact on everyday life

Unit Introduction

In this unit you are going to explore the social implications of contemporary computing, the good and bad effects. It will cover various aspects of computing and how each impacts on society’s daily lives and includes such aspects as the Internet, the web, mobile, cloud computing, among others. You will find out that the daily lives of individuals/society/organization have changed over time with the introduction and use of computing systems. This includes changes in the mode of interactions, way of transacting business, changes in organizational structures and even, that way people behave has been affected. You will also find out that there are advantages and disadvantages of using these computing systems.

Unit Objectives

Upon completion of this unit you should be able to:

- Analyze the characteristics of an online community
- Define the terms used in contemporary computing technologies
- Evaluate the benefits of social media to individuals/business/society
- Explain the differences between varieties of social media tools
- Characterize the various contemporary computing tools’ impact on individuals’/societies/businesses’/organizations’ daily activities.

Some introductory materials on the use computers by individuals/businesses/organizations can be found in http://www.tutorialspoint.com/computer_fundamentals/computer_applications.htm where there is illustration of the various areas where computing is used/applied.

Computing is used in business organizations for such processes as in payroll management, budgeting, sales, analysis, human resource and inventory control. In banking, it used to provide to facilities such as online accounting facility, current balances inquiries, deposits, overdrafts, interest charges, shares, and trustee records. ATM machines are making it even easier for customers to deal with banks. There is also mobile banking where banking is done largely using mobile devices. You can make, for example, make deposits, check balances, withdraw to mobile phone, make payments for services and goods.

Insurance companies are maintaining a database of all clients with information showing procedure to continue with policies starting date of the policies, next due installment of a policy, maturity date, interests due, survival benefits bonus. In the education system we have Computer Based Education(CBE) which involves control, delivery, and evaluation of learning. The computer education is rapidly increasing the graph of number of computer students. There are number of methods in which educational institutions can use computer to educate the students. It is used to prepare a database about performance of a student and analysis is carried out on this basis.
In **marketing**, uses of computer are seen in advertising. With computers, advertising professionals create art and graphics, write and revise copy, and print and disseminate ads with the goal of selling more products. At Home Shopping facilities has made it possible to have computerized catalogues that provide access to product information and permit direct entry of orders to be filled by the customers.

Computers are in **health sector** have become important part in hospitals, labs and dispensaries. The computers are being used in hospitals to keep the record of patients and medicines. It is also used in scanning and diagnosing different diseases. Some major fields of health care in which computers are used are: Diagnostic Systems in which computers are used to collect data and identify cause of illness. Lab-diagnostic Systems in which all tests can be done and reports are prepared by computer. Patient Monitoring Systems, which are used to check patient's signs for abnormality such as in Cardiac Arrest, ECG etc. Pharma Information Systems in which a computer checks drug labels, expiry dates, harmful drug's side effects etc. In surgery, whereby nowadays computers are also used in performing surgery.

Computers are widely used in Engineering purposes such as in Computer aided design (CAD). Computing provides for the creation and modification of images. Other fields in engineering such as **Structural Engineering**, computers are used for stress and strain analysis for design of ships, buildings, budgets and airplanes, among others. **Industrial Engineering in which** computers deal with design, implementation and improvement of integrated systems of people, materials and equipment. **Architectural Engineering in which** computers help in planning towns, designing buildings, determining a range of buildings on a site using both 2D and 3D drawings.

Computers are largely used in **defense such as in** modern tanks, missiles, weapons etc. The military also employs computerized control systems. Some areas of military where a computer has been used are: missile control, military communication, military operation and planning smart weapons.

In **Communication sector**, computing provides means to convey a message, an idea, a picture or speech that is received and understood clearly and correctly by the person for whom it is meant for. Some main areas in this category are: E-mail, chatting, Usenet, file transfer protocol (FTP), telnet, and video-conferencing.

Computers play an important role in **government**. Some major fields in this category are: budget preparation and monitoring, sales tax department, income tax department, analysis, planning and forecasting, computerization and management of voter lists, computerization of driving licensing system, computerization of personal identification card(PIN) card and weather forecasting.

Almost every sector now uses some form of computing, and there is some impact on the use of these computing tools. Some used have had positive effects, while other effects are negative in nature.

The social media tools and applications (Facebook, Twitter, Google+, LinkedIn, blogs, last FM, Flickr, YouTube, and others) are now handy and have made work and processes easier and less costly. Most of these would require a user to first register using a sign up facility where one provides required details and are stored by the system. Then one can invite friends to be
part of one’s network. The network will enable you to share so many things including photos, images, ideas, gossip, discussions, and many others depending on the application. You can also make downloads of the shared materials, can start a discussion on some topic, choose what to do, send notifications, create your own web pages, create advertisements, create and share a blog, view activity logs, subscribe or unsubscribe. You can also form virtual groups with some goal in mind where those with similar interests may subscribe to or join.

**Key Terms**

- **A blog (a truncation of the expression weblog):** is a discussion or informational site published on the World Wide Web and consisting of discrete entries (“posts”) typically displayed in reverse chronological order (the most recent post appears first).

- **A discussion board** (known also by various other names such as discussion group, discussion forum, message board, and online forum): This is a general term for any online “bulletin board” where you can leave a message and expect to see responses to messages you have left.

- **Facebook** (formerly [the Facebook]): This is an online social networking service where you can connect with friends, clients, organizations, etc.

- **Flickr** (pronounced “flicker”): This is an image hosting and video hosting website, and web services suite that was created by Ludicorp in 2004 and acquired by Yahoo in 2005.

- **Online community:** a virtual community whose members interact with each other primarily via the Internet

- **Online marketing:** It refers to a set of powerful tools and methodologies used for promoting products and services through the Internet.

- **Social Bookmarking websites:** These are online sites that enable users to store, organize, search and manage links to Web pages that they want to remember or share with other people. Usually organized by topic, bookmarks can be available to the public, saved privately or shared only with certain people or groups.
Social media: This is the collective of online communications channels dedicated to community-based input, interaction, content-sharing and collaboration.

Social networking: This is the practice of expanding the number of one’s business and/or social contacts by making connections through individuals.

Teleconferencing means meeting through a telecommunications medium. It is a generic term for linking people between two or more locations by electronics. There are at least six types of Twitter: This is an online social networking service that enables users to send and read short 140-character messages called “tweets”.

WhatsApp Messenger is a cross-platform instant messaging application that allows iPhone, BlackBerry, Android, Windows Phone and Nokia smartphone users to exchange text, image, video and audio messages for free.

YouTube: This is a video-sharing website headquartered in San Bruno, California

Last.fm: This is a music website, founded in the United Kingdom in 2002.

Learning Activities

Introduction

The Internet has brought in many applications that have changed the way individuals / businesses / organizations interact. So many things have changed from education where we have e-learning, open education resources, creation, sharing and distribution of resources, online teaching and interactions; virtual communities where persons with common interests may form a group to champion some cause, advocate and press for some rights, share and brainstorm on issues; and many others. The kind of applications that are in use and are available are many. Each has its own way of having contributed to society’s ease of performing its tasks. Most of these applications are social media tools and social media has many categories and these R. M. (2015, April 13). The World’s 21 Most Important Social Media Sites and Apps in 2015. Retrieved April 5, 2016, from http://www.socialmediatoday.com/social-networks/2015-04-13/worlds-21-most-important-social-media-sites-and-apps-2015. Each category has affected the individual / organization / society in its own way.
Activity 2.1 - Internet/book reading, research [Expected time of completion: 10 hours]

Activity Details

By using the Internet and by reading the materials listed for this unit, find out what the following social media applications are used for:

- Facebook
- LinkedIn
- Twitter
- Blogs
- Google+
- Google drive
- YouTube
- List FM
- Tunein

Prepare a report of your findings and send to the instructor using contacts provided. In the report include how the user will interact with the application, characteristics of each application and indicate how online users use these application.

Activity 2.2 - Internet/book reading, research [Expected time of completion: 21 hours]

In this activity, you are required to read and use the Internet search to establish which of the applications mentioned in activity 2.1 are useful in:

- Business marketing
- Business/individual branding
- Block messaging
- Social networking
- General interactions with clients/friends
- Quick methods of passing information
- Professional work image

In your report include the reasons why you think they are useful in the area of application, and the benefits of social media tools to individuals/business/society in the application areas. You may also interview individuals/organizations/society to enrich your information.
Activity 2.3: Exploratory [Expected time of completion: 10 hours]

Compare the mode of communications/interactions between individuals/society/business/organizations used in the past and the current ones where computing plays a big role.

List advantages and disadvantages past and current mode of communication. You may assume the past is ten years ago. Pick at least three examples from the past and their equivalent in the present.

Prepare a report of your findings and send to the instructor using contacts provided. In the report include the impact of social media to individual, organization, business and society.

Assessment

1. Which of the following is not a social media application: Flickr, Myspace, LinkedIn?

2. Is it mandatory that you are an official of an organization before you create a Facebook on their behalf?

3. What social networking site has a feature called “Answers” that allows users to ask other members for professional advice?

4. Which site is primarily designed to host user-uploaded pictures and photos?

5. Which social networking site is primarily designed to allow users to share videos?

6. What applications are useful for linking professional persons who may want to be sharing their information?

Summary

In this unit, you have been able to internalize some of the terminologies that are used in contemporary computing technologies. You have understood the uses of the various tools of the Internet and social networking by individuals/society/organizations. The impact of using the technologies by individuals/society/organizations has been established. Most people are turning to interactive computing where computing devices are taking the place of humans. It is easier, cost effective, timely and robust. You will have noticed that there are positive and negative effects on individuals/society/organizations.

Unit Assessment

The three learning activities have reports that will be assessed and graded

Instructions

You will be required to send the reports for assessment to your instructor
Grading Scheme

Reports - 9%
Participation - 3%

Feedback

Which of the following is not a social media application: Flickr, Myspace, LinkedIn? Answer: Myspace

Is it mandatory that you are an official of an organization before you create a Facebook on their behalf? Answer: Yes, you must be mandated to work on behalf of the organization and have the authority

What social networking site has a feature called “Answers” that allows users to ask other members for professional advice? Answer: Blogs

Which site is primarily designed to host user-uploaded pictures and photos? Answer: Facebook

Which social networking site is primarily designed to allow users to share videos? Answer: Google drive, Facebook

What applications are useful for linking professional persons who may want to be sharing their information? Answer: Google drive

Unit Readings and Other Resources

The readings in this unit are to be found at course level readings and other resources.

The listed reading materials and other resources provided are relevant to the activities for this unit. Some are more detailed for one application/ experience/ usage/ system/ service.

Main Readings


Email marketing @2011. The Internet Marketing Academy & bookboon ISBN 978-87-7681-910-1

Optional readings and other resources:

Internet materials

- [http://www.tutorialspoint.com/computer_fundamentals/computer_applications.htm](http://www.tutorialspoint.com/computer_fundamentals/computer_applications.htm) - computer Applications
- [https://www.facebook.com/business](https://www.facebook.com/business) - Facebook for business
Unit 3. Professional Computing, Ethics and Society

Unit Introduction

This unit is important because you will learn how legal, social, and ethical issues surrounding the use of computing tools, software and development of applications affect individuals/society/organizations that come into contact with them. You will explore ethical decision-making processes as well as legal and social responsibility issues in connection with technology-related concerns. You will examine issues such as security, crime, privacy and intellectual property in the context of computing and this will make you appreciate both the professional, ethical and legal issues associated with computing applications.

Unit Objectives

Upon completion of this unit the learner should be able to:

- Differentiate between ethics and law, and how each relates to computing.
- Identify the ethical and legal issues that relate to computing in real situations you may encounter.
- Familiarize yourself with relevant ethical standards as developed by the Association of computing machinery (ACM).
- Recognize situations in which there may be legal issues relevant to your work in computing and information processing, such as intellectual property and privacy, and know some legal principles to apply.
- Advise on the available classifications by which intellectual property may be assessed.
- Demonstrate knowledge of the characteristics of copyright in law.
Key Terms

**A computer professional**: This is a person who works in the field of information technology.

**Institute of Electrical and Electronics Engineers (IEEE)**: This is a technical professional society that promotes the development and application of electro technology and allied sciences for the benefit of humanity, the advancement of the profession, and the well-being of our members.

**Computing Society (sometimes abbreviated CS)**: This is a professional society whose purpose and scope is “to advance the theory, practice, and application of computer and information processing science and technology” and the “professional standing of its members.” The society covers all major areas of computing and information technology, including computer hardware, software development, multimedia, IT, security, networking, and mobile computing.

**The Association for Computing Machinery (ACM)** is a USA-based international learned society for computing. It was founded in 1947 and is the world's largest scientific and educational computing society. It is a not-for-profit professional membership group. Its headquarters are in New York City.

**A copyright law**: This is a form of protection provided by the laws of a country to authors of “original works of authorship.” This includes literary, dramatic, musical, artistic and certain other creative works.

**Intellectual property rights**: These are the rights given to persons over the creations of their minds. They usually give the creator an exclusive right over the use of his/her creation for a certain period of time.

**Logical malleability**: Computers are logically malleable in that they can be shaped and molded to perform any activity that can be characterized in terms of inputs, outputs, and connecting logical operations.

**Identity**: It is possible with a computer to steal another person's identity, forge a message, or send a message anonymously.
Power mediation: Computing is still well-educated-younger-male-dominated field. This domination can be seen as an inequity. The computer is increasingly becoming such a basic tool that it is wrong for certain social groups not to have equal access to it, especially in the e-government era. The related ethical questions are the power distribution, equal opportunities, equity, fairness and justice.

Openness and availability: Computer networks make it easy for the user to come across a virtually unlimited amount of diverse information, even in cases of e.g. pornography, gambling, or sites with any kind of propaganda or superstition, which might be difficult to handle for certain groups of users.

Copying: Images, text and sound can be copied with a computer in a few seconds by a few clicks and can easily be used without attribution to the author or out of context. This causes the ongoing discussion about intellectual property.

Professional Computing

A person who has undergone training in a computer-related field college, universities and computer institutes or a person who has an extensive knowledge in the area of computing or a person working in the field of computing is said to be a computer professional. These people can be any of the following among others:

A systems analyst; this is an Information Technology person whose specialty is analysis, design and implementation of information systems. They are often the people who does the assessment of the suitability of information systems in regards their intended usage and these they do in consultation with stakeholders such as end users, vendors and programmers in order to get the intended outcome. This person normally uses analysis and design techniques to come up with solutions to business problems. Technology. They often serve as change agents who diagnose problems and propose solutions, changes, training and may encourage others to use the system. They look for ways of managing resistance to change.
A software engineer: This is someone who designs, develops, maintains, test and evaluates computer software and systems so that the computer or anything that may contain software can perform its work.

A computer repair technician This is a person who repairs and maintains computers and servers. Some technicians are very experienced and may work in such areas as data recovery, administering systems and information systems. They provide technical support to other categories of computer professionals. In some cases, they are self employed, subcontracted and/or consultants.

Database administrators (DBAs) use specialized software to store and organize data. They identify data to be stored, analyze the data and create database. (adapted and retrieved from Computer professional. (n.d.). Retrieved April 1, 2016, from https://en.wikipedia.org/wiki/Computer_professional

Privacy: Computers make very suitable tools for among others surveillance, collecting data about people and relating data about different people in order to disclose their habits and patterns of behavior.

Ethics: This is a set of moral principles that govern the behavior of a group or individual.

These people must be guided by some rules so that the systems they develop do not harm the users and will also not harm them. The systems also may not disadvantage other people, individuals and the general society.

Computer Ethics

This is a part of practical philosophy which deals with how computing professionals should make decisions regarding professional and social conduct or is a set of moral principles that regulate the use of computers. Computing creates a whole set of ethical problems which are unique to themselves and may include such problems as

- Unauthorized use of hardware or software
- Theft of software
- Disputed rights to computing products
- Use of computers to commit fraud
Computer ethics can be seen to cover four broad areas including: - computer crime, responsibility for computer failure, protection of computer property, records and software and privacy of the users and customers. Those that commit such crimes must be intelligent enough to manipulate a computer system and in such a position to access it in the first place. One example of computer crime is stealing funds via computer. Often the worst that can happen to such a thief is that he/she is merely required to return the stolen money. Many times that person will be fired, assuming he/she is an employee, but may be quickly hired by a competitor because of his/her skill. This creates practically no deterrent to committing computer theft because legal action is not often taken against the perpetrator. What information do we consider private?

**Property rights and law**

These are laws created by governments in regards to how individuals/organizations/society can control, enjoy benefits and transfer properties. It has four broad components which are referred to as bundles of rights (Property rights. (n.d.). Retrieved April 5, 2016, from [https://en.wikipedia.org/wiki/Property_rights_(economics)] ) and they are:

- the right to use the good
- the right to earn income from the good
- the right to transfer the good to others
- the right to enforce property rights

Intellectual property rights are rights to give to individuals/organizations/society over the creation of their intellects which may include software, applications and etc. They usually give the creator an exclusive right over the use of his/her creation for a certain period of time. Some common types of intellectual property rights (IPR) are trademarks, copyright, patents, industrial design rights, and in some jurisdictions trade secrets: all these cover music, literature, and other artistic works; discoveries and inventions; and words, phrases, symbols, and designs. The stated objective of most intellectual property law (with the exception of trademarks) is to “Promote progress and allow creators to grow in their trade. Each country has its own laws and bodies that gives policies and enforce the laws. World Intellectual Property Organization is the global forum for intellectual property services, policy, information and cooperation as given in World Intellectual Property Organization. (n.d.). Retrieved April 5, 2016, from [https://en.wikipedia.org](https://en.wikipedia.org) is the global forum for intellectual property services, policy, information
Learning Activities

Introduction

Computing systems are meant to facilitate the users to perform their work/activities effectively and efficiently. While performing these actions, some people/individuals/society/organization/groups may take offence, be injured, be disadvantaged. Individuals/organizations/businesses/society/groups have their own rules/policies/regulations that govern the development/use/distribution/sharing of computing resources in order to minimize these bad effects.

Activity Details

Learning Activity 3.1 (exploratory) [Estimated time 4 hours]

In this activity, you will use your local library or the Internet or even the ministry in charge of Information and communications to establish

If there is an organization(s) in your country that deals with intellectual property rights and describe the functions of the organization.

If there are any laws that have been developed and enacted in your country that deal with intellectual property rights.

You will then prepare a report which will be part of your reading materials and will include issues to do with such areas as privacy to information, copyright laws, plagiarism, personal use, unauthorized copying of software, and unauthorized manipulation of data, criminalist activities, honesty, and integrity.

Summarize your findings in a report of no more than 10 pages and share this with your colleagues and instructor using google drive or e-mail.

Conclusion

There are various organizations which have developed code of ethics to govern the use of computing. In most countries, there are bodies charged with responsibilities to develop policies and procedures that govern the development, use and protection of computing applications. You can also conclude that even organizations such as schools do have rules that ensure that their members use computing facilities in an ethical and legal manner.

Assessment

1. Give reasons why World Intellectual Property Organization (WIPO) was created.
2. How does your government execute copyright laws?
3. List examples of unauthorized use of software.
4. List situations when individuals/businesses/organizations misuse software.
5. Give examples of software use that can be classified as criminal/unethical.
Activity 3.2 - Research/discussion/report writing/tutorials
[estimated 6 hours]

Introduction

In this activity, you are to do your own individual research, write your findings in no more than 5 pages and then share with your colleagues using google drive or by e-mail so that you can discuss your position on any one of the scenarios presented. Each scenario is a description of real world examples of ethical, legal and moral societal concerns and you are to look through each of them against the code of ethics, privacy, intellectual property/trademark viewpoints.

Activity Details

The Korir_Emet software company where you are their software engineer has developed and deployed a software system that manages their finances and human resource issues. The software has been purchased by a number of users. This software has been designed to include parts that can access individual bank details. As a software engineer, you have discovered that there is a serious security flaw where login details of users can be easily obtained. Being an expert, you have alerted the company about the problem so that they can finance the upgrade of the system. You have done this a number of times and the last time you did so, you were warned against mentioning this to anybody.

Analyze this problem and suggest a course of action based on what you have read, researched and discussed about ethical issues. Write a report and share with other learners for comments and suggestions.

Innovative information technologies enterprise is being investigated concerning use of pirated software. When investigators requested access to information systems within the enterprise, they claimed that the person in charge of information systems was on leave for a period of time. They were given time to access the system, but the investigators found that the system had been formatted and new genuine software installed. The installation of new software caused a huge loss of the enterprise information. Enterprise information is of great importance in the daily activities of an organization. As an expert for the enterprise and requested for consultation on how to deal with the problem of software piracy, copyright and data recovery, what would you do? Prepare a position report giving your views.

Activity 3.3 - Research/discussion/report writing/tutorials

Introduction

In this activity, you are to do your own individual research, write your findings in no more than 5 pages and then share with your colleagues using google drive or by e-mail so that you can discuss your position on any one of the scenarios presented. Each scenario is a description of real world examples of ethical, legal and moral societal concerns and you are to look through each of them against the code of ethics, privacy, intellectual property/trademark viewpoints.

It is always the case that when you use a computing machine that is used by many people, you are supposed to log out. One of the workers in a health institution found a computer which
had been left by a worker in the laboratory section but having not logged out. This other worker got access to confidential information on the health records of his/her co-workers and copied them to a flash disk. How would you judge the employee’s behavior? Write a report and share/discuss with your colleagues and instructor using google drive or e-mail

Consider a situation where a person uses his/her mobile phone to take photos of others. This individual then downloads a photo application program and distorts to suit what s/he wants to tell others. The distorted images are then circulated in the social media.

1. What is the inappropriate action?
2. What harm can this action cause?
3. Which ethical law has this action violated?

Write a report and share/discuss with your colleagues and instructor using google drive or e-mail.

**Conclusion**

The use of computing systems and applications has permeated every part of the society. It can be used to do good to others, improve business, reduce costs, save on space requirements for storage of data and/or information. Processing speeds are high and that means one can pass information to others very fast, can share images, documents, information easily, can also communicate in real time with others.

The use of these applications/systems must be governed by some rules and regulations. There are those institutions that develop rules and regulations on the development and ownership of computing related devices/applications/systems. There are others who control the use of these applications/systems/devices so that they do not harm users, other users, general consumers of the products/services. People can be harmed either physically, morally, criminally or their privacy may be invaded and may be held at ransom based on certain information that may come into possession of bad people. There are also legal systems that govern the usage/development and use of the applications/systems. This means the actions, commissions/omissions of computing users must be controlled so that the development, deployment, use and/or consumption is seen as ethical, moral, legal and does not harm others while you enjoy the speed and storage capabilities of these applications/system/devices.

**Assessment**

1. Differentiate between ethics and feelings.
2. What is the difference between trademark and intellectual property?
3. What are the objectives of the World Intellectual Property Organization (WIPO)?
4. List the categories of goods and services that are in the computing area found in the International classification of goods and services.
Summary

This unit has enabled you to be able to differentiate between ethics and law, and how each relates to computing. It was also meant to make you be able to identify the ethical and legal issues that relate to computing in real situations you may encounter.

You have familiarized yourself with relevant ethical standards as developed by the Association of computing machinery (ACM) and Institute of Electrical and Electronics Engineers (IEEE) and this will assist you to recognize situations in which there may be legal issues relevant to your work in computing and information processing, such as intellectual property and privacy, and know some legal principles to apply. With the knowledge that you have gained, you can advise on the available classifications by which intellectual property may be assessed.

Unit Assessment

You will be required to produce a report to be used for unit assessment.

Instructions

You will pick one of the reports you prepared for activity 3.2 and 3.3. Use the feedback from your colleagues you had shared your report with, refine the report and take a stand and prepare your own report. The instructor for the unit will be coordinating to ensure you are actively participating. Again, participation will earn marks. You then send the final copy to your instructor for assessment and grading.

Grading Scheme

Report -10 %

Feedback

The report will have based on the accuracy of the ethical, legal and professional issues that affect the society and how best you have handled in your reports.
Unit Readings and Other Resources

The readings in this unit are to be found at course level readings and other resources.

The listed reading materials and other resources provided are relevant to the activities for this unit. Some are more detailed for one application/ experience/ usage/ system/ service.

- List at least five codes of ethics developed by IEEE and ACM institutions to guide the ethical use of computing (see [http://www.acm.org/about/se-code](http://www.acm.org/about/se-code)- software engineering code of ethics and professional practice and [http://www.cmpe.boun.edu.tr/~say/c150/intro/lit10.html](http://www.cmpe.boun.edu.tr/~say/c150/intro/lit10.html) - computer ethics and [https://www.acm.org/about-acm/acm-code-of-ethics-and-professional-conduct](https://www.acm.org/about-acm/acm-code-of-ethics-and-professional-conduct) - ACM code of ethics and professional conduct)
- Conference on Computing and Values, New Haven, CT.
Internet materials


https://www.acm.org/about-acm/acm-code-of-ethics-and-professional-conduct - ACM code of ethics and professional conduct

Course Summary

Course Assessment

There will be a final exam which will be done at the end of the semester. The exam will cover all the units for this course.

Instructions

The exam will be administered as per the participating institution examinations policy

Grading Scheme

The final exam will be marked out of 70%. The end of unit assessment marks of 20% and the mid term examinations marks of 10% will have the total marks be out of 100%.

Feedback

The marks will be processed as per the institution’s examinations policy.