Chapter 1 - Introduction to Information Technology

1.1 - Computers Are Everywhere

Essential Question

- How has the digital revolution changed communication?

Competencies

- 6670.34 Investigate the history and emerging advances of information technology.
- 6670.35 Describe the impact of information technology on business and society.

After completing this section, you will be able to:

- List the phases of the digital revolution.
- Describe embedded computers.
- Identify communication technologies.
- Discuss emerging technologies.

Terms

- augmented printing
- augmented reality (AR)
- bandwidth
- cloud computing
- computer
- digital revolution
- e-mail
- embedded computers
- emerging technologies
- information technology (IT)
- quick response (QR) codes
- interactive books
- smartphone
- software as a service (SaaS)
- software-defined storage

Digital Revolution

- **Information technology (IT)** _____ all work done with computers
- **Digital revolution** is the ever-expanding progression of technical, economic, and cultural _____ brought about by computers
- **Computer** is a device that _____ input, processes data, stores data, and produces usable output according to sets of stored instructions
- Giant Computers
    - Phase occurred from the _____s through the _____s
    - Characterized by room-sized computers
    - Connect via “dumb” terminals

Personal Computers

- Phase occurred from _____s through _____s

- Complete desktop-sized computers
- Communication via telephone lines

Networked Computers

- Phase occurred from mid-_____s to early _____s
- **E-mail** is communication sent to a computer address where the message is stored to be read at a later time by the recipient
- Internet
    - Began in 1960s as a US Department of Defense project called _____
    - Last restrictions for commercial use lifted in 1995

Networked Computers

- _____ Wide Web
    - Launched in 1991
    - Part of the Internet
- _____ Computing
    - Cell phones, tablets, e-readers, GPS devices
    - Capable of using Wi-Fi to minimize cost of transmissions

_____ **Computing**

- Involves storing and retrieving data from Internet-based spaces
- Began in early 2000s
- Similar to giant computer with personal computing devices like terminals

Embedded Computers

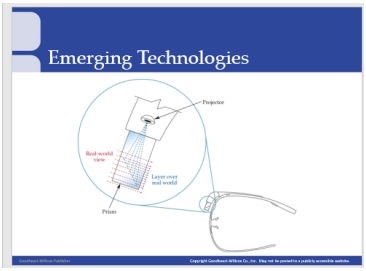
- _____ **computers** are small digital computers found inside other devices
- Not readily visible
- Location
    - Easily incorporated into many devices
    - Any programmable devices likely contain an embedded computer
- Continuous Operation
    - Expected to run continuously for _____ without error
    - Some must be kept running for safety reasons; others for lack of access

Communication Technologies

- A _____ is a handheld computer that contains a telephone, software applications, and the ability to quickly connect to the Internet
- Speed
    - _____ is a measure of the amount of data that can travel on a network
    - High bandwidth called broadband communications
- Reach
    - All that is required is an _____ connection

    - Global communication
- Advantages
    - Global _____ via social media, global discussions
    - Economic growth via wider access to money
- Disadvantages
    - Epidemic of crime and attacks on computers
    - Privacy and _____ at risk via ease of access

Emerging Technologies



- **Emerging technologies** are innovations that represent significantly new fields or technologies
- Visual Displays
    - Google Glass; smartphone apps
    - **Augmented reality (AR)** is a view of the live world that has been _____ with computerized graphics, sound, or other outputs
- Visual Displays
    - **Augmented printing** is a form of AR in which the user holds a mobile device over a _____ page, and instantly associated videos or other content appears on the screen
    - Printed page is connected to the virtual world
- Medical Technology
    - Diagnoses can be done remotely
    - Three-dimensional _____ for organ-transplant surgery
- _____ **Books**
    - Enhanced e-books that contain integrated multimedia features
    - Enhanced educational opportunities
- New and Emerging Classes of Software
    - **Software as a Service (SaaS)**
        - Software that resides in the cloud and is accessed by users _____ downloading or installing it on their local computers
        - Some of the software is free; others require a monthly subscription fee
    - **Software-Defined Storage**
        - Cloud-based _____ storage
        - Dropbox, Apple iCloud, Google Drive, Amazon Cloud
- New and Emerging Classes of Software
    - _____ **response (QR) codes**
        - Two-dimensional bar codes
        - Contain information that can be read in two directions
        - Encoded with a web or e-mail address, but may contain numeric, alphanumeric, binary, and kanji data types
- Software-Defined Networking
    - Local modification to network
    - Modifies OSI model

1.2 Computers in the Workplace

Essential Question

- How does changing technology affect current and future employment?

Competencies

- 6670.40 Investigate current and future trends in information technology.

After completing this section, you will be able to:

- Explain how advances in information technology have affected productivity.
- Describe the use of information technology in current employment.
- Discuss the future outlook for employment in information technology.

Terms

- telecommuting
- worker productivity

Worker Productivity

- **Worker productivity** is a measure of how _____ and quickly one can complete tasks
- Changing Tools
    - Workers are becoming loyal to their _____, not their employers
    - People used to read books and manuals to learn; now they use the Internet and search engines
- Eliminating Distance
    - Employees can communicate with colleagues around the world
    - _____ is working for a company from home using information technologies
- Technical Knowledge
    - Number of worldwide Internet devices in use in 1984 was only 1,000
        - 1,000,000 by 1994
        - 1,000,000,000 in 2008
        - 75,440,000,000 projected for 2025
    - Employers expect a solid foundation in hardware
    - Possible that what students learn in their first year will be _____ by their third year

Current Employment

- _____ basic understanding of computers
- Jobs have disappeared

    - Replaced by technology
    - Examples is printing press typesetter
- New jobs have appeared
    - Computer programmers
    - Help desk operators

Future Employment

- Emerging technologies grow from _____
- New jobs will emerge as time goes on
- Advanced Medical Research
    - Moving from treating and curing to preventing
    - Leads to more personalized health care
- Automotive Industry
    - Vehicles are becoming more energy efficient
    - More complex _____ computers are being developed
- Finance
    - Real-time data to model _____ growth
    - Computer programs to perform financial analysis
- Home Health Care
    - Increased by 50 percent over last few years
    - _____ connection to patients
- _____ Collar Jobs
    - Designing, manufacturing, selling, installing, and maintaining environmentally friendly technologies
    - Clean energy and other environmentally friendly jobs

1.3 - Challenges of a Digital Society

Essential Question

- Why is it important to close the digital divide?

Competencies

- 6670.41 Examine social, ethical, and legal issues associated with information technology.

After completing this section, you will be able to:

- Identify cultural and social issues related to information technology.
- Discuss ways to close the digital divide.

Terms

- cybersecurity
- data mining
- digital divide
- digital middle class

Cultural and Societal Issues

- Digital Middle Class
    - Group of heavy technology adopters and users _____ new technology
    - Users expect more capability to be available to maximize access to the Internet
    - Small businesses _____ the movement
- Data Mining
    - Method of searching through huge amounts of data to find patterns
    - Buying _____ of customers is analyzed and trends are made visible to translate into marketing data
    - Concerns about what data are being collected
- Cybersecurity
    - _____ of information is a great concern to society
    - Branch of IT that protects computer systems

Closing the Digital Divide

- **Digital divide** is the _____ between those individuals, communities, and countries having access to the information technologies that transform life and those who do not have this access
- Educational, social, and economic _____ across all demographics
- Educational
    - Schools provide access to technology
    - Students use online textbooks
- _____
    - Free Wi-Fi in many areas invite customers
    - Free training in libraries and local colleges
- _____
    - Operate without electricity grid
    - Smartphones access financial services