NEW PERSPECTIVES

Chapter 9
The Computer Industry: History, Careers, and Ethics
Computer Concepts 2014

9 Chapter Contents

9 FastPoll True/False Questions
Answer A for True and B for False

- 090100 Charles Babbage invented the first digital circuits.
- 090200 The ABC, Harvard Mark I, COLOSSUS, and ENIAC can be classified as computer prototypes.
- 090300 UNIVAC was one of the first personal computers.
- 090400 Transistors were an important technology in radios and second-generation computers.
- 090500 Integrated circuits were a key technology in third-generation computers.
- 090600 The dot com bubble refers to the period when domain names were added to the Internet.

9 FastPoll True/False Questions
Answer A for True and B for False

- 090700 VARs are online discount computer dealers.
- 090800 The Internet is regulated in the U.S. by the FDIC.
- 090900 Many computer professionals work in IT departments.
- 091000 The computer industry employs very few contract workers.
- 091100 The Association for Computing Machinery has identified five major computing disciplines.
- 091200 In the computer industry, certification works just as well as a 4-year degree.

9 FastPoll True/False Questions
Answer A for True and B for False

- 091300 A metasearch tool can search more than one online database at a time.
- 091400 The Digital Millennium Copyright Act was replaced by the USA Patriot Act.
- 091500 CRTs are safer to use than LCDs.
- 091600 Carpal Tunnel Syndrome is classified as a sedentary lifestyle risk factor.

9 Section A: Computer History

- Manual Calculators
- Mechanical Calculators
- Computer Prototypes
- Generations of Computers
- Personal Computers

9 Question

- 092100 If you were around when third-generation computers were invented, you would have been listening to what type of popular music?
  - A. Grateful Dead
  - B. Beatles
  - C. Elvis
  - D. Aerosmith

9 Manual Calculators

- Devices that assist in the process of numeric calculations, but require the human operator to keep track of the algorithm

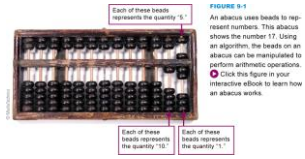


FIGURE 9-1
An abacus uses beads to represent numbers. This abacus shows the number 17. Using an algorithm, the beads on an abacus can be manipulated to perform arithmetic operations. Click this figure in your interactive eBook to learn how an abacus works.

9 Manual Calculators

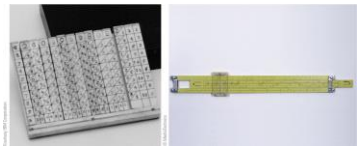


FIGURE 9-2
Napier's Bones (left) evolved into the slide rule (right). Watch a video showing how a slide rule works.

9 Mechanical Calculators

- Implement algorithms autonomously
  - Schickard's Calculator
  - Pascaline
  - Leibniz Calculator
  - de Colmar's Arithmometer
  - Difference Engine
  - Analytical Engine
  - Hollerith Tabulating Machine

9 Mechanical Calculators

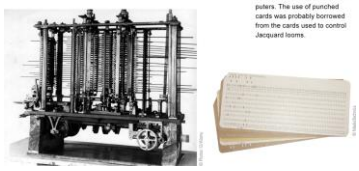


FIGURE 9-3
Babbage's Analytical Engine was designed to process programs and data stored on punched cards, much like those used in 1970s mainframe computers. The use of punched cards was probably borrowed from the cards used to control Jacquard looms.

9 Computer Prototypes

- Experimental devices that typically must be further developed and perfected
  - Atanasoff-Berry Computer (ABC)
  - Z3

9 Computer Prototypes

- Harvard Mark I (IBM Automatic Sequence Controlled Calculator) COLOSSUS
- ENIAC

FIGURE 9-5
Constructed of relay switches, rotating shafts, and clutches, the Harvard Mark I sounded like a "roomful of ladies knitting." The device was 51 feet long and 8 feet tall and weighed about 5 tons.

9 Generations of Computers

- UNIVAC is considered the first commercially successful digital computer
- First-generation computers
  - Vacuum tubes
- Second-generation computers
  - Transistors

FIGURE 9-6
Transistors first sparked a revolution in the entertainment industry by providing a small, power-efficient technology for portable radios. Later, transistors were incorporated in computers to replace large, hot, power-hungry vacuum tubes.

9 Generations of Computers

- Third-generation computers
  - Integrated circuits
    - RCA Spectra 70
    - IBM 360
    - DEC PDP-8
    - IBM AS/400
- Fourth-generation computers
  - Microprocessor

FIGURE 9-10
Jack Kilby's original integrated circuit was a key development for creating today's small, fast, and efficient computers.

FIGURE 9-11
The Intel 4004 microprocessor was small. Its chip (lower right) was only 1/8" by 1/16". Even in the chip carrier (top left), the microprocessor was less than 1" in length.

9 Personal Computers

- Mark-8
- MITS Altair
- Apple I / Apple II
- VisiCalc

FIGURE 9-12
Although it was sold as a kit, required assembly, and was too limited to perform significant computational tasks, the Altair was snapped up by hobbyists interested in learning how computers worked.

FIGURE 9-13
The Apple II was the most popular computer of its time.

9 Personal Computers

- IBM PC
  - IBM PC XT
- Apple Lisa
- Xerox Alto
- Apple Macintosh

FIGURE 9-14
The IBM PC, which was launched in 1981, evolved into today's popular Windows-based PCs.

FIGURE 9-15
The Apple Macintosh computer popularized graphical user interfaces.

9 Section B: The Computer and IT Industries

- Industry Overview
- Economic Factors
- Product Life Cycles
- Market Share
- Marketing Channels
- Industry Regulation

9 Question

- 092200 Understanding the computer industry can be useful when purchasing a computer or making investment decisions. Which one of the following is the LEAST important aspect of the computer marketplace for consumers and investors?
  - A. Market share
  - B. Market valuation
  - C. Market channels
  - D. Market synthesis

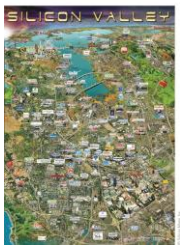
9 Industry Overview

- The computer industry encompasses companies that manufacture computers and computer components
- The information technology industry refers to companies that develop, produce, sell, or support computers, software, and computer-related products
  - Equipment manufacturers, chipmakers, software publishers, IT service companies, and computer retailers

9 Industry Overview

- Dot coms refer to the group of Internet-based companies
- Silicon Valley was the birthplace of integrated circuits, microprocessors, and personal computers
- Outsourcing vs. offshoring

FIGURE 9-18
Silicon Valley is home to many companies in the IT industry.

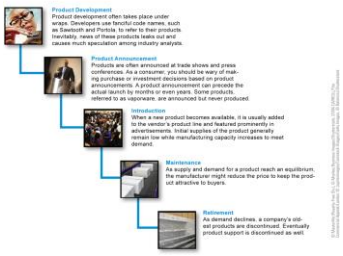


9 Economic Factors

- The IT industry is dynamic, prosperous, and economically beneficial
- The dot com business failures in 2001 and 2002
- Population growth and business globalization contributed to the success of the IT industry

9 Product Life Cycles

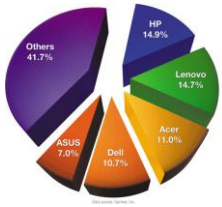
FIGURE 9-22
Hardware Product Life Cycle



9 Market Share

- Refers to a company's share, or total percentage, of the total market

FIGURE 9-24
Worldwide Market Share for Personal Computer Vendors in the Second Quarter of 2012 (Data includes desktop and portable computers, but not tablets such as the iPad.)



9 Marketing Channels

FIGURE 9-25
Computer hardware and software are sold through several marketing channels.

9 Marketing Channels

FIGURE 9-26
At Dell's Web site, customers can order a custom-built computer by simply clicking to add various hardware options. Click for more information about creating and ordering a custom-built computer.

9 Marketing Channels

- Value-added resellers (VARs) combine commercially available products with specialty hardware or software
- Consumers can benefit from a variety of channels
  - Channel conflict occurs when vendors within the channel find other channel vendors pirating their sales

9 Industry Regulation

- Some aspects regulated by government agencies
  - FCC
  - FTC
- Most IT industry leaders oppose further regulation

FIGURE 9-27
IT Industry Regulation


Internet activity is affected by policies of the U.S. Federal Communications Commission (FCC), which regulates interstate and international communications by television, wire, radio, satellite, and cable.

The U.S. Federal Trade Commission (FTC) and Department of Justice police the business practices of the IT industry, just as they police other industries.

9 Section C: Careers for Computer Professionals

- Jobs and Salaries
- Education and Certification
- Job Hunting Basics
- Resumes and Web Portfolios
- Professional Networking Sites
- Job Listings

9 Question

- 092300 Suppose you're considering a computing career. Which one of the following would give you the LEAST marketable resume for a career in the computer industry?
  - A. An associate degree in computer information systems and a network certificate
  - B. A Ph. D. in information technology with 4 years of work experience at Apple
  - C. A four-year degree in software engineering
  - D. An MBA with an emphasis on information systems

9 Jobs and Salaries

- Information Systems department
  - Chief Information Officer
  - Systems Analyst
  - Computer Programmer
  - Security Specialist
  - Database Administrator
  - Network Specialist/Administrator
  - Computer Operator
  - Technical Support Specialist
  - Web site designer

9 Jobs and Salaries

- Outside the IS department
  - Technical Writer
  - Computer Salesperson
  - Quality Assurance Specialist
  - Computer Engineer
  - Manufacturing Technician

9 Jobs and Salaries

- Contract workers are typically hired as consultants and are not official employees
- Telecommuting allows workers in many industries to work from home and makes financial sense

9 Education and Certification

- Computer engineering
- Computer science
- Information systems
- Information technology
- Software engineering
- The Peterson's Web site is a comprehensive resource for educational services
  - www.petersons.com

9 Education and Certification

- A certification exam is an objective test that verifies your level of knowledge about a particular technology or subject
  - General computer knowledge
  - Software applications
  - Database administration
  - Networking
  - Computer hardware
  - Computer security

FIGURE 9-33
Your local bookstore and the Internet provide sources for independent study materials that can help you prepare for an IT certification exam.

9 Job Hunting Basics

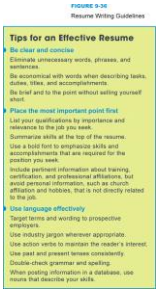
- Job hunting steps
- The Internet is a great resource for finding a job

FIGURE 9-34
Job Hunting Steps

9 Resumes and Web Portfolios

- You can prepare your resume in formats suitable for different computer platforms and delivery methods
  - Print
  - E-mail
  - HTML

9 Resumes and Web Portfolios



9 Resumes and Web Portfolios

- A Web portfolio is a hypertext version of your resume, which might contain links to relevant Web sites
- You can post your Web portfolio on your personal Web site

9 Professional Networking Sites

- Every person who has serious career ambitions should have a LinkedIn account
  - Complete your profile
  - Request recommendations
  - Add connections
  - Join groups

9 Job Listings

- Sources of job listings
  - Newspaper's Help Wanted section
  - School's career placement office
  - Local state employment agency
  - Online newspapers
  - Company Web sites
  - Employment services

9 Job Listings

9 Section D: Professional Ethics

- Ethics Basics
- IT Ethics
- Ethical Decision Making
- Whistleblowing

9 Question

- 092400 It is not unusual to encounter situations at work that call for ethical decisions. Which one of the following is the LEAST useful way to prepare for such situations?
  - A. Accumulate as much proprietary information as possible that pertains to your company and its employees.
  - B. Become familiar with relevant laws and legal decisions.
  - C. Take time to look at one or more codes of ethics.
  - D. Get to know your employer's policies.

9 Ethics Basics

- Professional ethics refers to on-the-job choices and actions that reflect a person's values
- Laws try to promote ethical behavior
  - Laws and ethics are not necessarily the same
- Ethical values apply to any career field
- Ethical decisions can vary from one field to another

9 IT Ethics

- Situations that require computer professionals to make ethical decisions often involve
  - Software copyrights
  - Privacy
  - Conflict of interest
  - Use of work computers
  - Software quality
  - Hacking
  - Social responsibility

FIGURE 9-42
Copyrights can trigger ethical dilemmas.

9 IT Ethics

- Confidentiality is the obligation not to disclose willingly any information that should be kept private
  - Applies to individuals and organizations
  - Proprietary information
- It is never good practice to use facilities at work for personal activities

9 IT Ethics

- Computer professionals have to keep up with the latest threats from viruses and intrusion attempts
  - Hacking
- Computer professionals should consider the repercussions of shortened software test cycles
- Software developers should consider whether they will be responsible for how their software is used

9 Ethical Decision Making

- Talk to people whose judgment you respect
- Consider what the most ethical person you know would decide to do
- Think about what you would do if your actions were made public
- Look at the problem from the opposite perspective
- Consult a code of professional ethics

9 Ethical Decision Making

- A code of ethics is a set of guidelines designed to help professionals make decisions

FIGURE 9-49
Many IT professional organizations offer codes of ethics.

"Ten Commandments" from the Computer Ethics Institute Professional Code

- Thou shalt not use a computer to harm other people.
- Thou shalt not interfere with other people's computer work.
- Thou shalt not snoop around in other people's files.
- Thou shalt not use a computer to steal.
- Thou shalt not use a computer to bear false witness.
- Thou shalt not use or copy software for which you have not paid.
- Thou shalt not use other people's computer resources without authorization.
- Thou shalt not appropriate other people's intellectual output.
- Thou shalt think about the social consequences of the program you write.
- Thou shalt use a computer in ways that show consideration and respect.

9 Ethical Decision Making

- Codes of ethics are published online and are available to the public

FIGURE 9-50
The ACM posts a code of ethics at its Web site.

9 Whistleblowing

- Disclosure by an employee of confidential information which relates to some danger, fraud, or other illegal or unethical conduct
  - Speaks out against on-the-job activities
- Whistleblowers are often fired or forced out of their jobs

9 Whistleblowing

- Before whistleblowing:
  - Examine your motives
  - Try the normal chain of command
  - Collect evidence to back up your accusations
  - Record events as they unfold
  - Act ethically
  - Be ready to accept repercussions
  - Establish a support network
  - Consult a lawyer
  - Consider your strategy

9 Section E: Work Area Safety and Ergonomics

- Radiation Risks
- Repetitive Stress Injuries
- Eye Strain
- Back Pain
- Sedentary Lifestyle

9 Question

- 092500 Which one of the following is the best way to avoid health hazards while working with computers?
  - A. Use a CRT display.
  - B. Take frequent breaks.
  - C. Move your display to a position lower than your chin.
  - D. Elevate your keyboard to chest height.

9 Radiation Risks

- Every electronic device emits some type of radiation

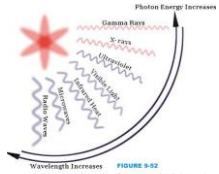


FIGURE 9-52
Some types of radiation, such as light, heat, microwaves, and radio waves, are generally considered safer than Gamma rays, X-rays, and ultraviolet light.

9 Radiation Risks

- CRTs and LCD screens emit radiation
  - LCD screens emit low levels
- Cell phones emit RF energy
  - The scientific community continues to study and debate the amount of RF radiation that should be considered safe for long-term use
  - Use a hands-free headset to reduce exposure

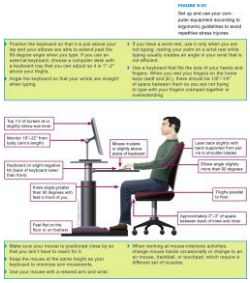
9 Repetitive Stress Injuries

- A repetitive stress injury (RSI) is not a specific disease but a group of similar overuse disorders that affect the tendons, muscles, and nerves
  - Carpal tunnel syndrome

FIGURE 9-54
Carpal tunnel syndrome is a condition affecting the nerve that runs to your thumb, index finger, and middle finger.

9 Repetitive Stress Injuries

- Ergonomics is the study of safe and efficient environments, particularly working environments



9 Eye Strain

- Studies have found links between computer use and eye problems

FIGURE 9-56
You can position your monitor by stretching out your arm parallel to the ground. Your fingertips should almost touch the center of the screen.

9 Eye Strain

- Adjust screen resolution to a comfortable level
  - Native resolution

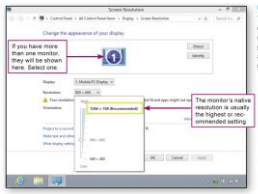


FIGURE 9-57
To find your screen's native resolution when using Windows, check the display settings. In general, the highest resolution available is your screen's native resolution.

9 Back Pain

- Back pain can be caused by many factors, including poor posture and careless lifting of heavy objects
- The key to comfort while working on a computer is keeping your shoulders relaxed so that tense muscles don't generate headaches and stiffness

FIGURE 9-59
Bad posture can lead to back pain

9 Sedentary Lifestyle

- People who live and work in digital cultures tend to spend many hours each day in sedentary pursuits, such as watching television and using computers
- Sitting still for long periods of time, especially in positions that limit blood circulation can be a health risk
- Your chair should not prevent good circulation to your legs

9 Sedentary Lifestyle

- Try to take breaks periodically
- Break reminder software can help you remember when it is time to take a break from your work

FIGURE 9-60
Once you set your preferences, your break reminder software will display a pop-up window when it is time for you to take a break.

9 What Do You Think?

- 093100 Does the Turing Test of machine intelligence make sense to you?
  - A. Yes B. No C. Not sure
- 093200 If a computer can beat human contestants in Jeopardy!, is it showing signs of intelligence?
  - A. Yes B. No C. Not sure
- 093300 Do you believe that computers might someday have the capacity to think?
  - A. Yes B. No C. Not sure

NEW PERSPECTIVES

Chapter 9 Complete

Computer Concepts 2014