Chapter Fourteen

Computers at Work

After reading this chapter, you should be able to:

- Explain how the emerging information economy differs from earlier social and economic systems

- Describe how computers have changed the way people work in factories, offices, homes, and a variety of industries

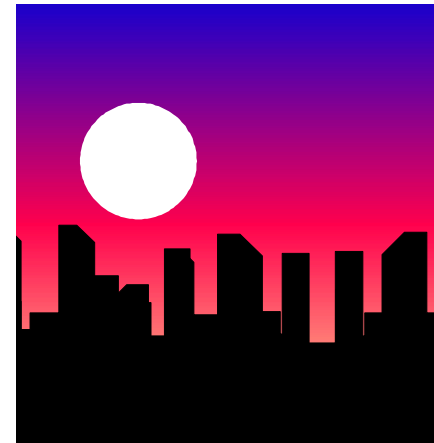# After reading this chapter, you should be able to:

- Describe how modern managers use computers as tools

- Describe several ways computers have changed the quality of jobs, both positively and negatively

- Speculate on how our society will adjust as more and more jobs are automated

Chapter Outline

- Into the Information Age

- Where Computers Work

- Management by Computer

- Computers and Jobs
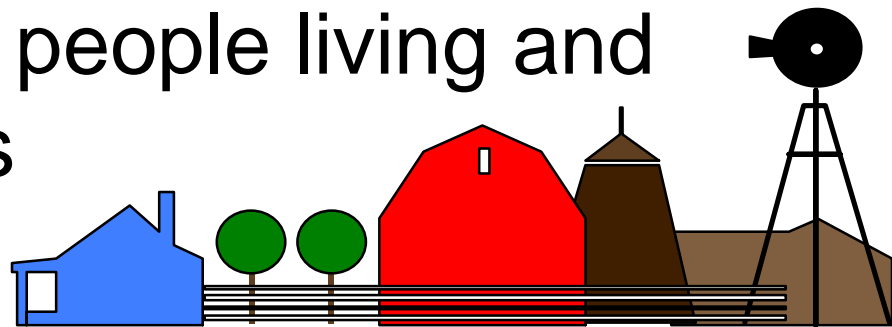
- Considering Computer Careers

Into the Information Age

- There have been three monumental changes in civilization. These paradigm shifts represent changes in thinking that resulted in a new way of seeing the world:
  - The Agricultural Economy
  - The Industrial Economy
  - The Information Economy

14.5

The Agricultural Economy

- Gradually, hunter and gatherer societies learned to domesticate animals, grow their own grains, and use agricultural tools

- This agricultural economy is characterized by people living and working on farms

14.6

The Industrial Economy

- Slowly, technological advances in factories promised a higher standard of living

- This industrial economy is characterized by families moving from farms into cities to work

The Information Economy

- Advances in information technology have attracted people from factories
  - Today, clerical workers outnumber factory workers

- Incomes in an information economy are dependent upon computers

Examples of Computers in the Workplace

- Entertainment: all aspects of entertainment production

- Publishing: writing and transmitting text and graphics

Examples of Computers in the Workplace

- Medicine: patient records, monitoring patients, and assisting physicians
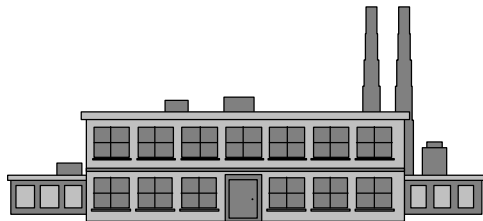
Examples of Computers in the Workplace

- Transportation: reservations, navigation, and training
- Science: collect, analyze, and share findings

14.11

Where Computers Work

- Computers are part of the modern workplace. They have given rise to the:

Automated Factory

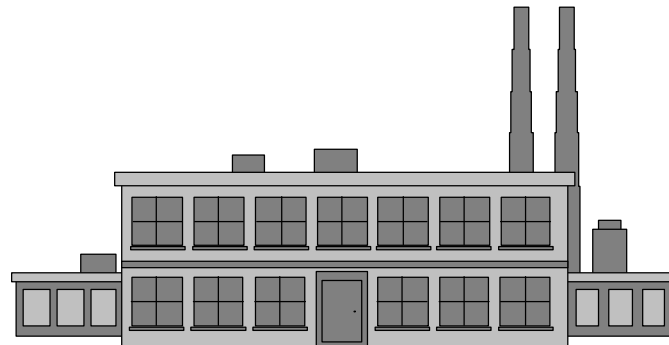**Automated Office**

Electronic Cottage

The Automated Factory

- In an automated factory, robots are used to:
  - Paint, weld, and perform other repetitive assembly-line jobs
  - Track inventory
  - Control production quality

14.13

The Automated Factory

- Advantages of robots in factories are that they:
  - Reduce idle time because of tighter integration of planning with manufacturing
  - Reduce waste in facilities, raw materials, and labor

The Automated Office

- Office automation has evolved from mainframes to desktop computers and has given rise to:
  - Enterprise computing: integrates PCs and other computers into a seamless system

14.15

The Automated Office

– Workgroup computing: encourages computer-supported cooperative work

– The paperless office: promotes the use of digital storage media and on-line publishing, instead of paper use

14.16

The Electronic Cottage

- Telecommunication technology has brought work into the home

- The telecommuter gets to work via a modem, not a car
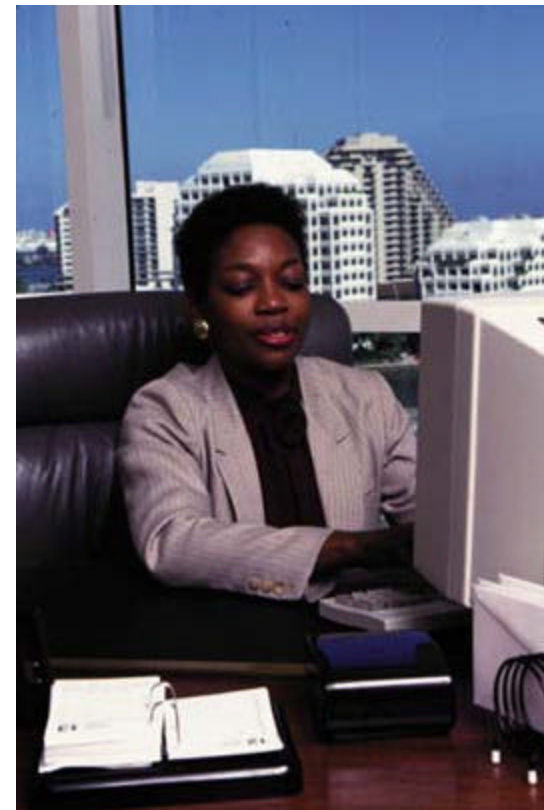
The Electronic Cottage

- Advantages of telecommuting:
  - Increases productivity
  - Allows for more flexible work schedules
  - Reduces automobile commuters (decreasing pollution and need for parking lots)
  - Saves time spent commuting to work

Management by Computer

- Computers are not only tools of clerical workers in an automated office, but also are a resource to managers

- Managers use computers in the following ways:
  - Management Information Systems
  - Decision Support Systems
  - Other Management Tools
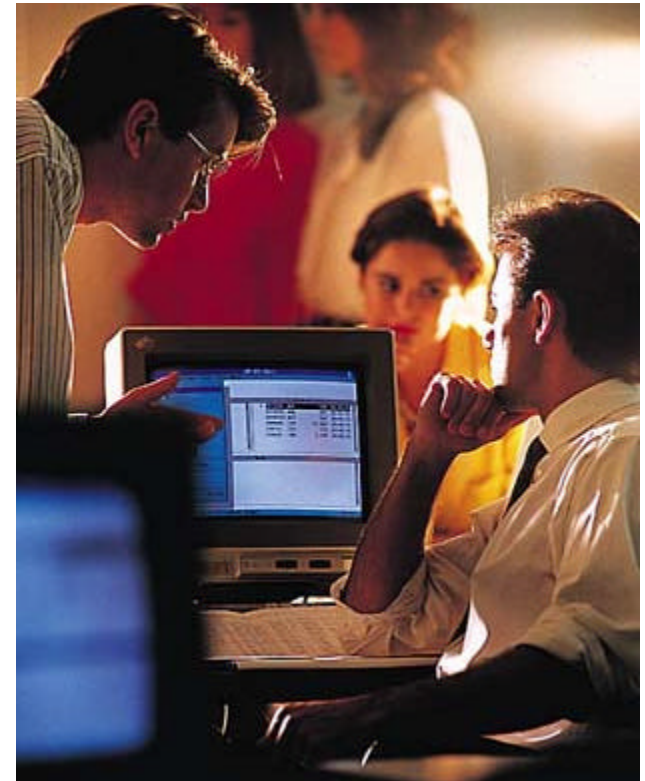
Management Information Systems (MISs)

- Modern managers use computers to help them with routine planning, organizing, staffing, directing, and controlling their organizations
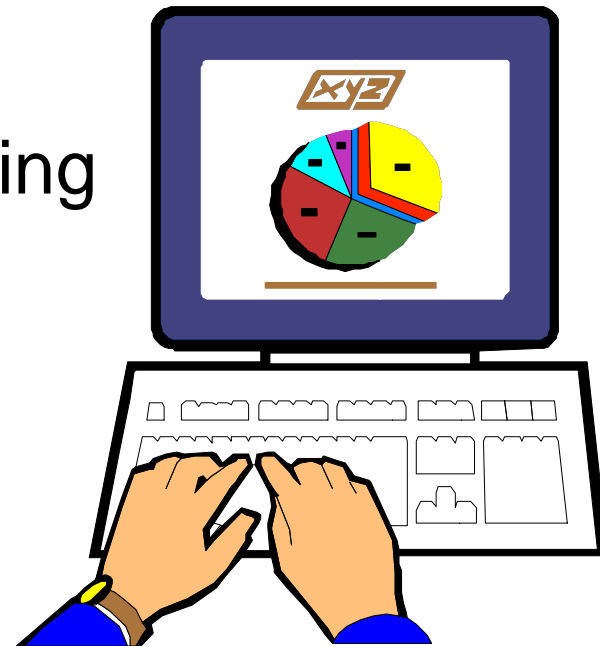
Management Information Systems (MISs)

- How MISs are used:
  - Organize and analyze financial transactions, sales figures, inventories
  - Examine trends and relationships
  - Produce reports
  - Focus on day-to-day operations
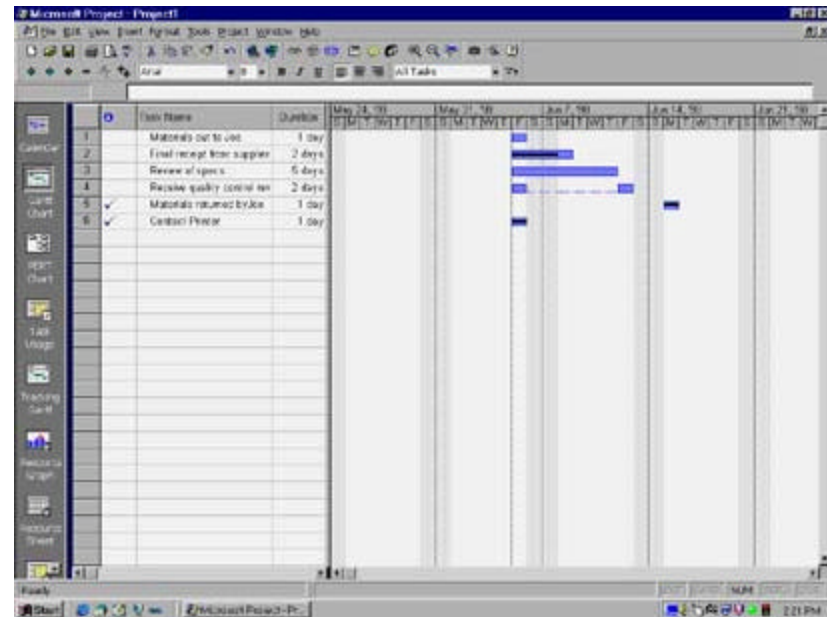
Decision Support Systems (DSSs)

- Modern managers use computers for nonroutine decision making

- How DSSs are used:
  - Forecasting and answering "what if?" questions
  - Creating mathematical models of business systems

14.22

Other Management Tools

- Project management software: coordinate, schedule, and track complex work projects

- Expert systems: expert advice on limited subjects

Other Management Tools

- Spreadsheets: manage budgets, make financial projections, etc

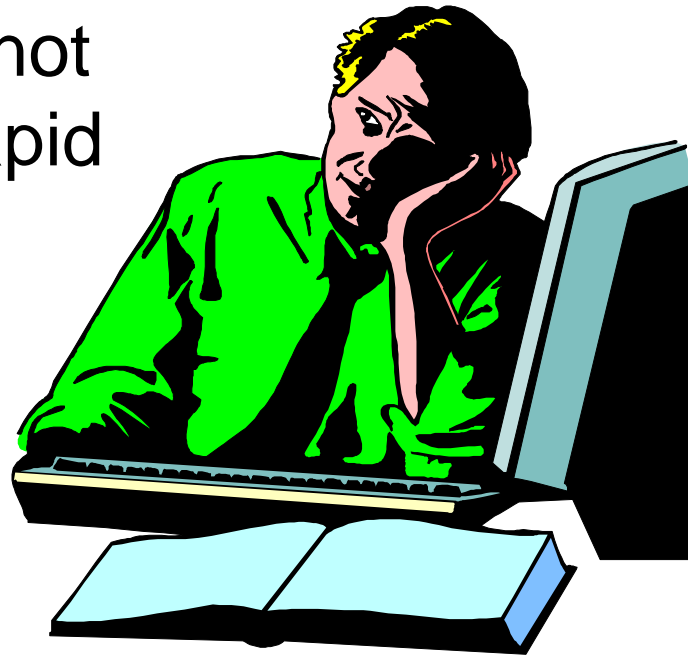- The Internet and on-line information services: instant information from worldwide sources

14.24

Computers and Jobs

- Some of the controversies surrounding computers in the workplace involve productivity versus:

  – Profit: unreliable systems and maintenance cut into profits

14.25

Computers and Jobs

- PCs: workers are distracted by PCs, lose time due to computer problems, and cannot keep up with the rapid changes

- People: the ways people work and interact often are not considered

14.26

Successful Computer Systems

- Analysts believe that the most successful computer systems are those that are:
    - Human centered
    - Designed to retain and enhance human skills and control
    - Designed with input from the people who will use the system in their jobs
    - Likely to give users greater job satisfaction

Computers and Job Quality

- For some people, computers have caused more problems than they have solved

- Some of these problems include:
  - De-skilling and Up-skilling
  - Monitoring and Surveillance
  - The Electronic Sweatshop

14.28

De-Skilling and Up-Skilling

- De-skilling: computers have transformed the work so that it now requires less-skilled employees
  - Clerks using automated cash registers
  - Data-entry clerks

De-Skilling and Up-Skilling

- Up-skilling: computers have transformed the work so that it now requires highly skilled employees
  - Clerks using advanced software

Monitoring and Surveillance

- Computer technology can be used to track, record, and evaluate worker performance

- Monitoring often occurs without the worker's knowledge

14.31

Monitoring and Surveillance

- Problems associated with worker monitoring and surveillance:
  - Loss of worker privacy
  - Reduced morale (workers experience stress and anxiety)
  - Devalued skills (emphasis is put on skills that can be measured by computer)
  - Loss of quality (workers know that only quantity is measured by the employer)

The Electronic Sweatshop

- An electronic sweatshop is where computer monitoring and surveillance are commonplace

- Data-entry clerks often work under these harsh conditions:
  - The clerk has a single job, to enter data into the database

The Electronic Sweatshop

– The workplace is often a windowless room filled with hundreds of clerks sitting at computer terminals

– Minimum wages are paid for a mindless task

– All keystrokes entered and time spent on the phone are monitored electronically

14.34

Employment and Unemployment

- Job automation is an important issue for millions of workers whose jobs are threatened by machines

- Whether we will see more employment or unemployment, we must consider:
    - Workers Against Machines
    - Forecasting the Future
    - A New Economy

14.35

Workers Against Machines

- The 19th-century Luddites attacked textile machinery that threatened their jobs

- Some suggest that technology will inhibit economic growth

- Computers in the workplace may be creating two classes of workers:

  - A growing mass of poor, uneducated people
  - A shrinking class of affluent, educated people

Forecasting the Future

- Some suggest that, for now, technology will stimulate economic growth

- For instance:

  – More technology may automate more jobs and create more unemployment

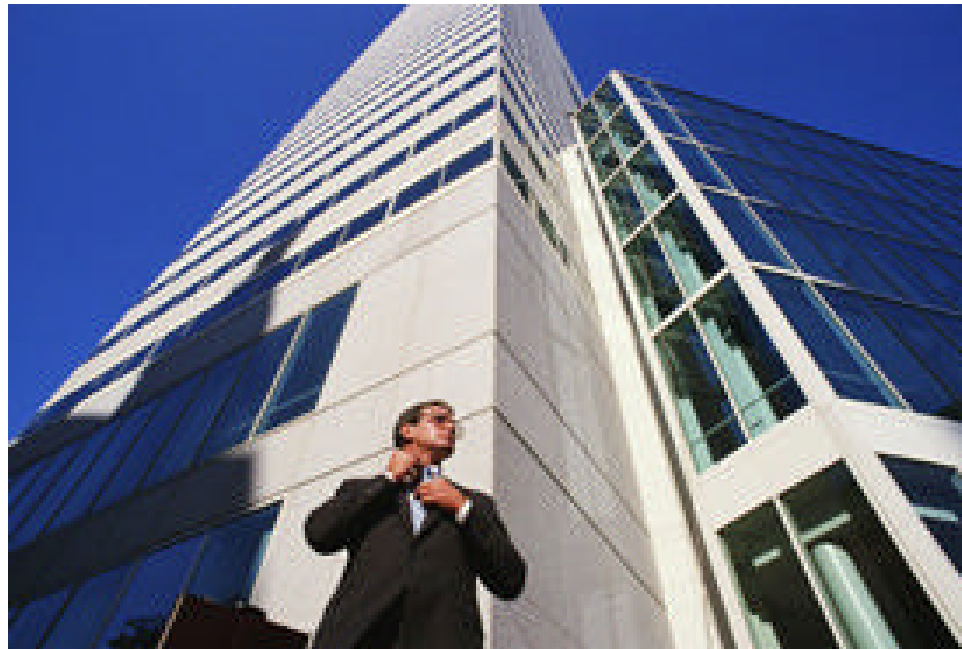 – The demand for professionals will likely increase

Forecasting the Future

- Education is key to the trained work force that will be needed

What Will We Need for the Future?

- In the long run, education may not be enough

What Will We Need for the Future?

- Machines will probably do more of our work, resulting in jobless growth (productivity increases because machines are working—not people)

- Without employment, what becomes of our political, economic, and social systems?

14.40

Considering Computer Careers

- Tips for a computer-related career:
    - Learn touch-typing
    - Use computers regularly
    - Don't forsake the basics
    - Combine your passions

14.41

Considering Computer Careers

- Tips for a computer-related career:
  - Ask questions
  - Cultivate community
  - If you can't find your dream job, build it yourself
  - Prepare for change