Ethics in Information Technology, Fourth Edition

Chapter 8

The Impact of Information Technology on Productivity and Quality of Life

Objectives

- As you read this chapter, consider the following questions:
    - What impact has IT had on the standard of living and worker productivity?
    - What is being done to reduce the negative influence of the digital divide?
    - What impact can IT have on improving the quality of healthcare and reducing its costs?

Objectives (cont'd.)

- What ethical issues are raised because some entities can afford to make significant investments in IT while others cannot and thus are blocked in their efforts to raise productivity and quality?

The Impact of IT on the Standard of Living and Worker Productivity

- Gross domestic product (GDP)
  - Measurement of the material standard of living
  - Equals total annual output of a nation's economy
- Standard of living in U.S. and developed countries
  - Has improved for a long time
  - Rate of change varies as a result of business cycles
- Productivity
  - Amount of output produced per unit of input
  - Measured in many different ways

The Impact of IT on the Standard of Living and Worker Productivity (cont'd.)

- United States
  - Labor productivity growth 2% annually
  - Living standards have doubled about every 36 years
  - Modern management techniques and automated technology increase productivity

- Innovation
  - Key factor in productivity improvement
  - IT has an important role

IT Investment and Productivity

- Relationship between IT investment and productivity growth is complex
  - Rate of productivity from 1995 to 2005 is only slightly higher than the long-term U.S. rate
  - Possible lag time between:
    - Application of innovative IT solutions
    - Capture of significant productivity gains
- Other factors besides IT influence worker productivity rates
- Difficult to quantify how much the use of IT has contributed to worker productivity

IT Investment and Productivity (cont'd.)

- Factors that affect national productivity rates
  - Business cycles of expansion and contraction
  - Outsourcing to contractors can skew productivity
  - Regulations make it easier to hire and fire workers
  - More competitive markets for goods and services
  - Difficult to measure output of some services
  - IT investments don't always yield tangible results

IT Investment and Productivity (cont'd.)

TABLE 8-1 Fundamental drivers for productivity performance

Reduce the amount of input required to produce a given output by:	Increase the value of the output produced by a given amount of input by:
Consolidating operations to better leverage economies of scale	Selling higher-value goods
Improving performance by becoming more efficient	Selling more goods to increase capacity and use of existing resources

Source Line: Course Technology/Cengage Learning.

IT Investment and Productivity (cont'd.)

- Telework/Telecommuting
  - Employee works away from the office
  - Advances in technology enable communications
  - Highly skilled workers demand more flexibility
  - Laws passed to encourage telework
  - Organizations must prepare guidelines and policies
  - Some positions are not suited to telework
  - Some individuals are not suited to be teleworkers

TABLE 8-2   Advantages/disadvantages of teleworking for employees

Advantages	Disadvantages
People with disabilities who otherwise find public transportation and office accommodations a barrier to work may now be able to join the workforce.	Some employees are unable to be productive workers away from the office.
Teleworkers avoid long, stressful commutes and gain time for additional work or personal activities.	Teleworkers may suffer from isolation and may not really feel "part of the team."
Telework minimizes the need for employees to take time off to stay home to care for a sick family member.	Workers who are out of sight also tend to be out of mind. The contributions of teleworkers may not be fully recognized and credited.
Teleworkers have an opportunity to experience an improved work/family balance.	Teleworkers must guard from working too many hours per day because work is always there.
Telework reduces ad hoc work requests and disruptions from fellow workers.	The cost of the necessary equipment and communication services can be considerable if the organization does not cover these.

Source Line: Course Technology/Cengage Learning.

IT Investment and Productivity (cont'd.)

TABLE 8-3 Advantages/disadvantages of teleworking for organizations

Advantages	Disadvantages
As more employees telework, there is less need for office and parking space; this can lead to lower costs.	Allowing teleworkers to access organizational data and systems from remote sites creates potential security issues.
Allowing employees to telework can improve morale and reduce turnover.	Informal, spontaneous meetings become more difficult if not impossible.
Telework allows for the continuity of business operations in the event of a local or national disaster and supports national pandemic-preparedness planning.	Managers may have a harder time monitoring the quality and quantity of the work performed by teleworkers, wondering, for instance, if they really "put in a full day."
The opportunity to telework can be seen as an additional perk that can help in recruiting.	Increased planning is required by managers to accommodate and include teleworkers.
There may be an actual gain in worker productivity.	There are additional costs associated with providing equipment, services, and support for people who work away from the office.
Telework can decrease an organization's carbon footprint by reducing daily commuting.	Telework increases the potential for lost or stolen equipment.

Source Line: Course Technology/Cengage Learning.

The Digital Divide

- **Standard of living**
  - Level of material comfort measured by the goods, services, and luxuries available
- **Digital divide**
  - Gulf between those who do/don't have access to:
    - Cell phones
    - Personal computers
    - The Internet
  - Gulf among age groups, economic classes, and cities/rural areas

The Digital Divide (cont'd.)

- Digital divide must be bridged to improve resolution of:
  - Health emergencies
  - Crime emergencies
  - Other emergencies
- Access to IT and communications technology:
  - Enhances learning
  - Provides educational and economic opportunities
  - Influences cultural, social, and political conditions

The Digital Divide (cont'd.)

- Education Rate (E-Rate) program
  - Created by the Telecommunications Act of 1996
  - Goal to help schools and libraries obtain:
    - Access to state-of-the-art services and technologies
    - Discounted rates
  - Supported with up to $2.25 billion per year from fees charged to telephone customers
  - Administered by the Universal Service Administrative Company (USAC)
  - Has not gone well but continues today

The Digital Divide (cont'd.)

- Low-cost computers for developing countries
  - One Laptop per Child (OLPC)
    - Provides low-cost laptop computers for education
  - Classmate PC from Intel
  - Eee notebook from Asus
- Mobile phone
  - Tool to bridge the digital divide
  - Costs less than PC and more broadly available

The Impact of IT on Healthcare Costs

- Rapidly rising cost of healthcare is major challenge
  - Spending increasing at 6.3% per year
  - Grow from $2.6 trillion to $4.6 trillion by 2019
- Increase (above inflation) due to new medical technology
  - Diagnostic procedures and treatments
  - Patients sometimes overuse medical resources
- Patient awareness must be raised
- Technology costs must be managed
- Improved use of IT can lead to cost reductions

Electronic Health Records

- Electronic health record (EHR)
  - Computer readable record of health-related information on an individual: patient demographics, medical history, family history, immunization records, lab data, health problems, progress notes, medications, vital signs, and radiology reports
  - Summary of health information generated by each patient encounter in any healthcare delivery setting
  - Effective use of EHR improves patient care and reduces costs

Electronic Health Records (cont'd.)

- Lack of patient data transparency results in:
  - Diagnostic and medication errors
  - Ordering of duplicate tests
  - Compromise of patient safety
  - At least 98,000 people die in hospitals each year due to preventable medical mistakes

Electronic Health Records (cont'd)

- Health Information Technology for Economic and Clinical Health Act (HITECH)

  – Requires government to develop standards for nationwide exchange and use of health information

  – Provides $20 billion in incentives

  – Saves $10 billion through improvements in quality of care

  – Strengthens protection of identifiable health information

Use of Mobile and Wireless Technology in the Healthcare Industry

- Healthcare industry is a leader in adopting mobile and wireless technology

  – Means to access/update EHR at bedsides

  – Scan barcodes to match patient with medications

  – Communicate with healthcare employees

Telemedicine

- Employs modern telecommunications and information technologies

- Provides medical care to people who live far away from healthcare providers

- Store-and-forward telemedicine
  - Acquires data, sound, images, and video from patient and transmits to medical specialist for evaluation at a later time
  - Does not require presence of patient

Telemedicine (cont'd.)

- Live telemedicine
  - Requires the presence of patient and healthcare provider at the same time
  - Involves a video conference link between the two sites

Telemedicine (cont'd.)

- Use of telemedicine raises new ethical issues:
  - Must physicians providing advice to patients at remote location be licensed at that location?
  - Must healthcare system be required to possess a license from a state in which it has a virtual facility?
  - Must minimum set of technology standards be met?
  - What sort of system certification and verification is necessary?
  - Does patient involvement with remote doctors have negative impact on the local doctor's relationship?

Medical Information Web Sites for Laypeople

- People need reliable information on a wide range of medical topics to:

  - Learn more about healthcare services
  - Take more responsibility for their health

- Web sites are not substitutes for professional medical advice, diagnosis, or treatment

- Some healthcare providers and employers offer online tools that go beyond basic health information

TABLE 8-5   Health information Web sites

URL	Site
www.americanheart.org	American Heart Association
www.cancer.org	American Cancer Society
www.cdc.gov	Centers for Disease Control and Prevention
www.diabetes.org	American Diabetes Association
www.heartburn.about.com	Information on the causes of heartburn and how to prevent it
www.heartdisease.about.com	Basic information about heart disease and cardiology
www.medicinenet.com	Source for medical information on a variety of topics, including symptoms, procedures, tests, and medications, as well as a medical dictionary
www.nia.nih.gov/Alzheimers	National Institute on Aging—Alzheimer's Disease Education and Referral Center
www.niddk.nih.gov	National Institute of Diabetes and Digestive and Kidney Diseases
www.oncolink.upenn.edu	Abramson Cancer Center of the University of Pennsylvania
www.osteo.org	National Institutes of Health—Osteoporosis and Related Bone Diseases National Resource Center
www.urologychannel.com	Information about urologic conditions, including erectile dysfunction, HIV, AIDS, kidney stones, and STDs; site contains overviews, symptoms, causes, diagnostic procedures, and treatment options
www.webmd.com	Access to medical reference material and online professional publications

Source Line: Course Technology/Cengage Learning.

Summary

- Gross national product (GNP) measures material standard of living

- Progressive management uses IT to innovate products, processes, and services

- Telework opportunities can be used to:
  - Reduce costs
  - Increase productivity
  - Reduce organization's carbon footprint
  - Prepare for potential local or widespread disasters

Summary (cont'd.)

- The digital divide exists:
  - Between more and less developed countries
  - Within countries, among:
    - Age groups
    - Economic classes
    - People who live in cities versus those in rural areas
- New information technologies can be used with little capital cost to reduce the digital divide

Summary (cont'd.)

- Healthcare costs are soaring out of control
  - 6.3% annual growth rate
  - Will reach $4.6 trillion by 2019
- Improved use of IT in the healthcare industry can lead to significantly reduced costs
  - Electronic health records (EHRs)
  - Telemedicine
  - Web-based health information