



Ethics in Information Technology

Chapter 8

The Impact of Information Technology on Productivity and Quality of Life

George W. Reynolds

Learning Objectives

- 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?
- 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?

Impact of IT on the Standard of Living and Worker Productivity

- Gross domestic product (GDP)
 - Measurement of the material standard of living
 - Represents 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

IT Investment and Productivity

- **Productivity**

- Amount of output produced per unit of input
- Measured in different ways
- Is increased by modern management techniques and automated technology

- **Innovation**

- Key factor in productivity improvement

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.

Factors Affecting National Productivity Rates

- Business cycles of expansion and contraction
- Outsourcing to contractors skews productivity
- Regulations simplify hiring and firing workers
 - Makes it easier for markets to relocate workers to more productive firms and sectors
- Competitive markets for goods and services
- Service based economy makes it difficult to measure output of some services
- IT investments don't always yield tangible results but produce intangible benefits

Telework/Telecommuting

- Work arrangement in which employee works away from the office
- Facilitated through following factors
 - Advances in technology enable communications
 - Highly skilled workers demand more flexibility
 - Laws that encourage telework
- Requires that organizations prepare guidelines and policies
- All positions and individuals are not suited for telework

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 can reduce 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 against 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.

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.

Factors Beyond the GDP-Based Measurement of Standard of Living

Average number of calories consumed per person per day

Availability of clean drinking water

Average life expectancy

Literacy rate

Availability of basic freedoms

Factors Beyond the GDP-Based Measurement of Standard of Living

Number of people per doctor

Infant mortality rate

Crime rate

Rate of home ownership

Availability of educational opportunities

Digital Divide

- Describes the gulf between those who do and those who don't have access to modern information and communications technology
- Access to IT and communications technology :
 - Enables resolution of health, crime, and other emergencies
 - Provides educational and economic opportunities
 - Influences cultural, social, and political conditions

Initiatives to Bridge the Digital Divide

Education Rate (E-Rate) program

- Helps schools and libraries obtain broadband Internet services to advance the availability of educational and informational resource
- Provides cost discounts for eligible telecommunications services

Low cost computers

- **One Laptop per Child (OLPC):** Aims to provide children around the world with low-cost laptops
- Classmate PC and Raspberry Pi - Inexpensive computers developed by Intel and Raspberry Pi Foundation respectively

Mobile phones

- Has resulted in an increased investment in the infrastructure required to support wireless communications

Advantages of Cell Phones over Personal Computers

- Available in wide range of capabilities and costs, but are cheaper than personal computers
- Portable and convenient
- Have extended battery life
- No learning curve required to master the use of a cell phone
- No costly or burdensome applications required
- No technical-support challenges to overcome

Impact of IT on Healthcare Costs

- Development and use of new medical technology accounts for much of the increase in healthcare spending per person in excess of general inflation
- To gain control over soaring healthcare costs:
 - Raise patient awareness
 - Manage technology costs

Electronic Health Records (EHR)

- Computer readable record of health-related information on an individual
- Summary of health information generated by each patient encounter in any healthcare delivery setting
- Effective use improves patient care and reduces costs

Electronic Health Records (EHR)

- **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

- Providing a means to access and update EHRs
- Enabling nurses to scan bar codes on patient wristbands
- Using wireless devices to communicate with healthcare employees

Telehealth

- Employs electronic information processing and telecommunications to:
 - Support at-a-distance health care
 - Provide professional patient health-related training, and support healthcare administration
- Improves patient access to healthcare information
- Enables doctors to keep a close watch on patients' conditions

Telehealth

- **Telemedicine:** Provides medical care to people at a location different from the 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
 - Helps recognizing problems in advance to avoid life threatening situations

Telehealth

- **Live telemedicine**

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

- **Remote monitoring:** Involves:

- Regular, ongoing measurement of an individual's vital signs and other health measures
- Transmission of this data to a healthcare provider

Telemedicine: 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?

Telemedicine: Ethical Issues

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

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

- 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

- 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