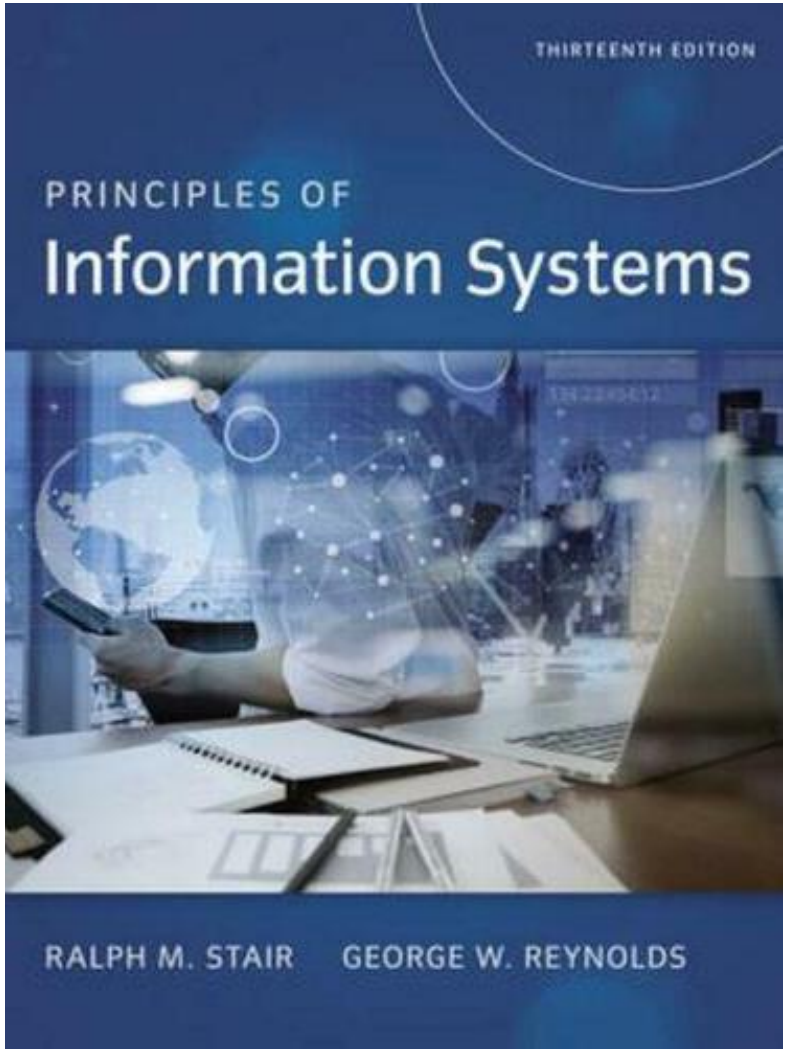
IS101 Principles of Information Systems

Cybercrime and Information System Security;
Ethical, Legal, and Social Issues of Information Systems

Lecturer: Dr Maya Krayneva

Textbook: Stair, R., & Reynolds, G. (2016). *Principles of information systems* (13th ed.). Cengage Learning.



Chapter 13: Cybercrime and Information System Security

Types of Exploits

Security strategy

Computer Forensics

Types of Exploits (1)

Common attacks include:

- **Ransomware** (malware that stops you from using your computer or accessing your data until you meet certain demands such as paying a ransom)
- **Viruses** (a piece of programming code, spreads)
- **Worms** (a harmful program, duplicates itself)
- **Trojan horses** (hidden malicious code)
- **Blended threat** (combination of threats)
- **Spam** (misuse of email systems)

Types of Exploits (2)

Distributed denial-of-service attacks
(overload of a target site)

- **Botnet (zombies):** large group of computers controlled by hackers from one or more remote locations, owners unaware of control

→ collective processing power like that of a supercomputer

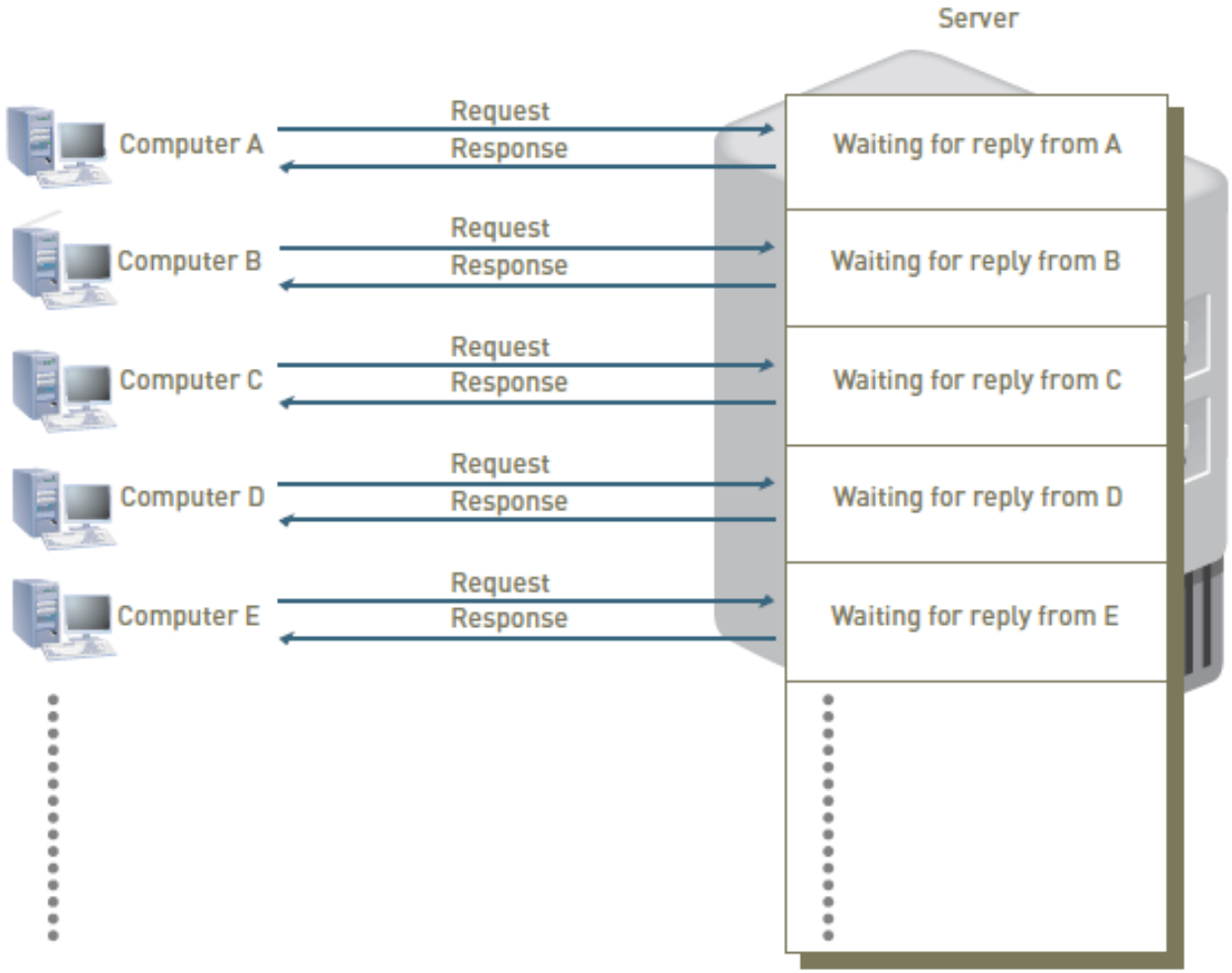
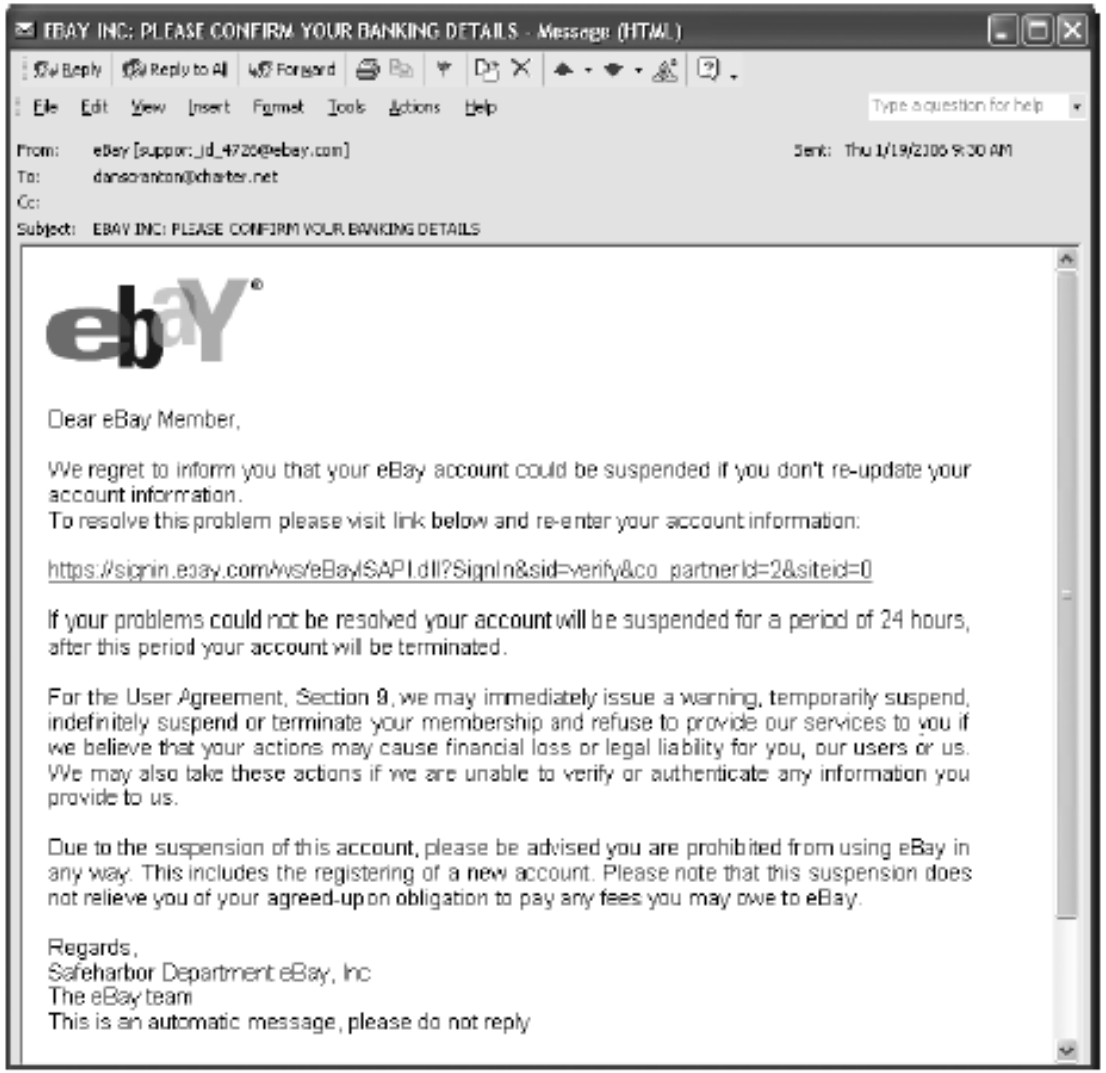


FIGURE 13.2
Distributed denial-of-service attack
A DDoS attack floods a target site with demands for data and other small tasks.

Types of Exploits (3)

- **Rootkits** (administrator-level access)
- **Advanced persistent threat** (undetected network attack, stealing data over a long period of time)
- **Phishing** (fraudulently using email to try to get the recipient to reveal personal data) and **Spear-phishing** (sent to a certain organization's employees)


EBAY INC: PLEASE CONFIRM YOUR BANKING DETAILS - Message (HTML)

Reply | Reply to All | Forward

File Edit View Insert Format Tools Actions Help

From: eBay [support_id_4726@ebay.com]
To: dansoranton@charter.net
Cc:
Subject: EBAY INC: PLEASE CONFIRM YOUR BANKING DETAILS

Dear eBay Member,

We regret to inform you that your eBay account could be suspended if you don't re-update your account information.
To resolve this problem please visit link below and re-enter your account information:

https://signin.ebay.com/ws/eBayISAPI.dll?SignIn&sid=verify&co_partnerId=2&siteid=0

If your problems could not be resolved your account will be suspended for a period of 24 hours, after this period your account will be terminated.

For the User Agreement, Section 9, we may immediately issue a warning, temporarily suspend, indefinitely suspend or terminate your membership and refuse to provide our services to you if we believe that your actions may cause financial loss or legal liability for you, our users or us. We may also take these actions if we are unable to verify or authenticate any information you provide to us.

Due to the suspension of this account, please be advised you are prohibited from using eBay in any way. This includes the registering of a new account. Please note that this suspension does not relieve you of your agreed-upon obligation to pay any fees you may owe to eBay.

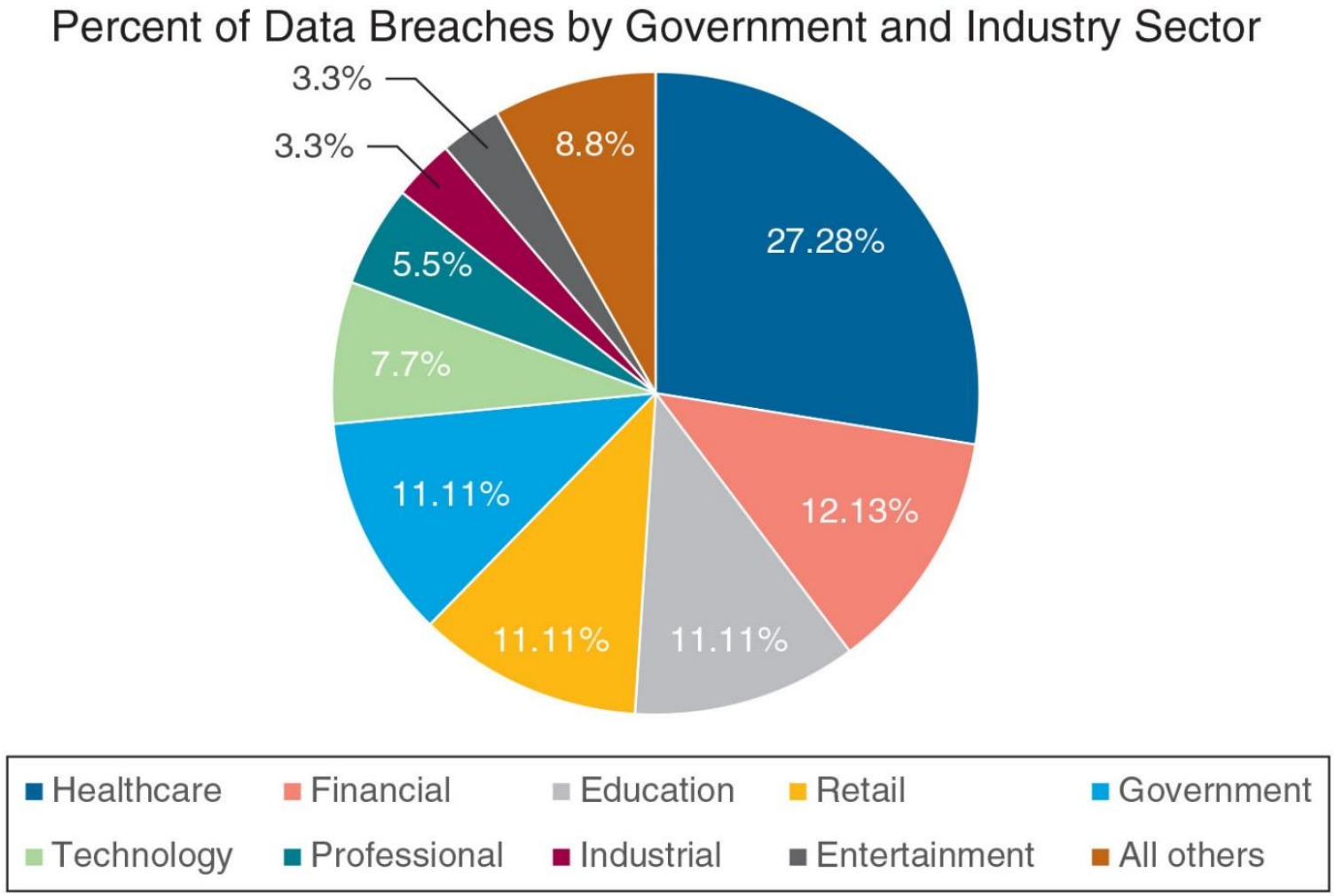
Regards,
Safeharbor Department eBay, Inc
The eBay team
This is an automatic message, please do not reply

FIGURE 13.3
Example of phishing email
Phishing attacks attempt to get the recipient to reveal personal data.

Types of Exploits (4)

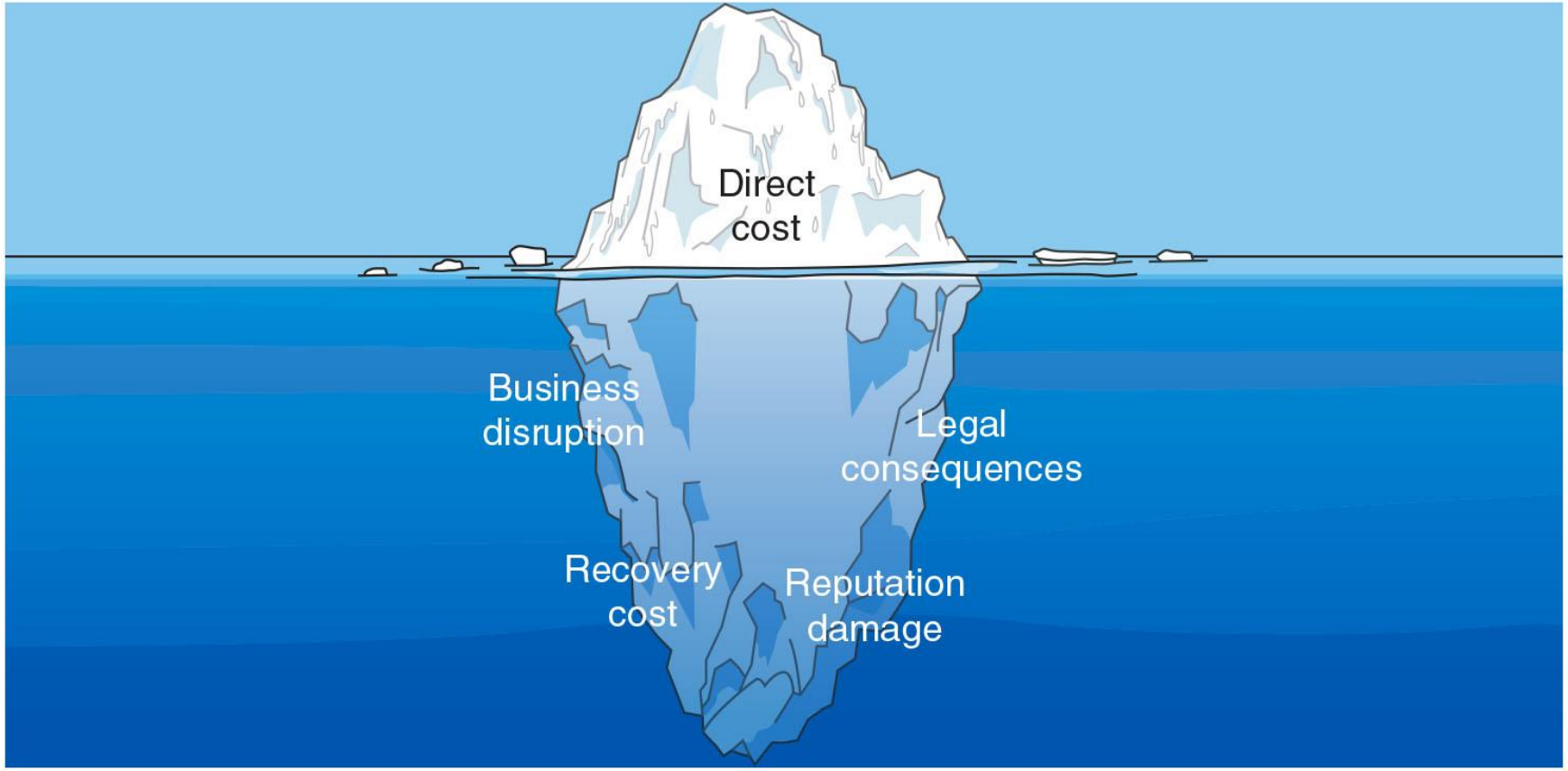
- **Smishing** (variation of phishing that involves the use of texting)
- **Vishing** (use of voice mail message telling to call a phone number or access a Web site)
- **Identity theft** (theft of personal information)
- **Cyberespionage** (malware that secretly steals data in the computer systems of organizations, such as government agencies, military contractors, political organizations, and manufacturing firms)
- **Cyberterrorism** (disable critical national infrastructure to achieve political, religious, or ideological goals)

Cyberattacks That Pose Serious Threats



Data breaches in government and industrial sectors in 2017

Consequences of a Successful Cyberattack



Security strategy

Start with a **risk assessment** (example: Table 13.5, p. 578**)**

- Identify and prioritize threats the organization faces

Define a **disaster recovery plan**

- Ensures data and technology assets availability

Review **security policies** guiding employees

- Follow recommended processes and practices

Perform **security audits**

- Ensure established policies being followed

Regulatory standards compliance

Intrusion detection system (IDS)

- Software and/or hardware that monitors system and network resources and activities

Firewall

- A system of software, hardware, or a combination of both that stands guard between an organization's internal network and the Internet and limits network access based on the organization's **access policy**

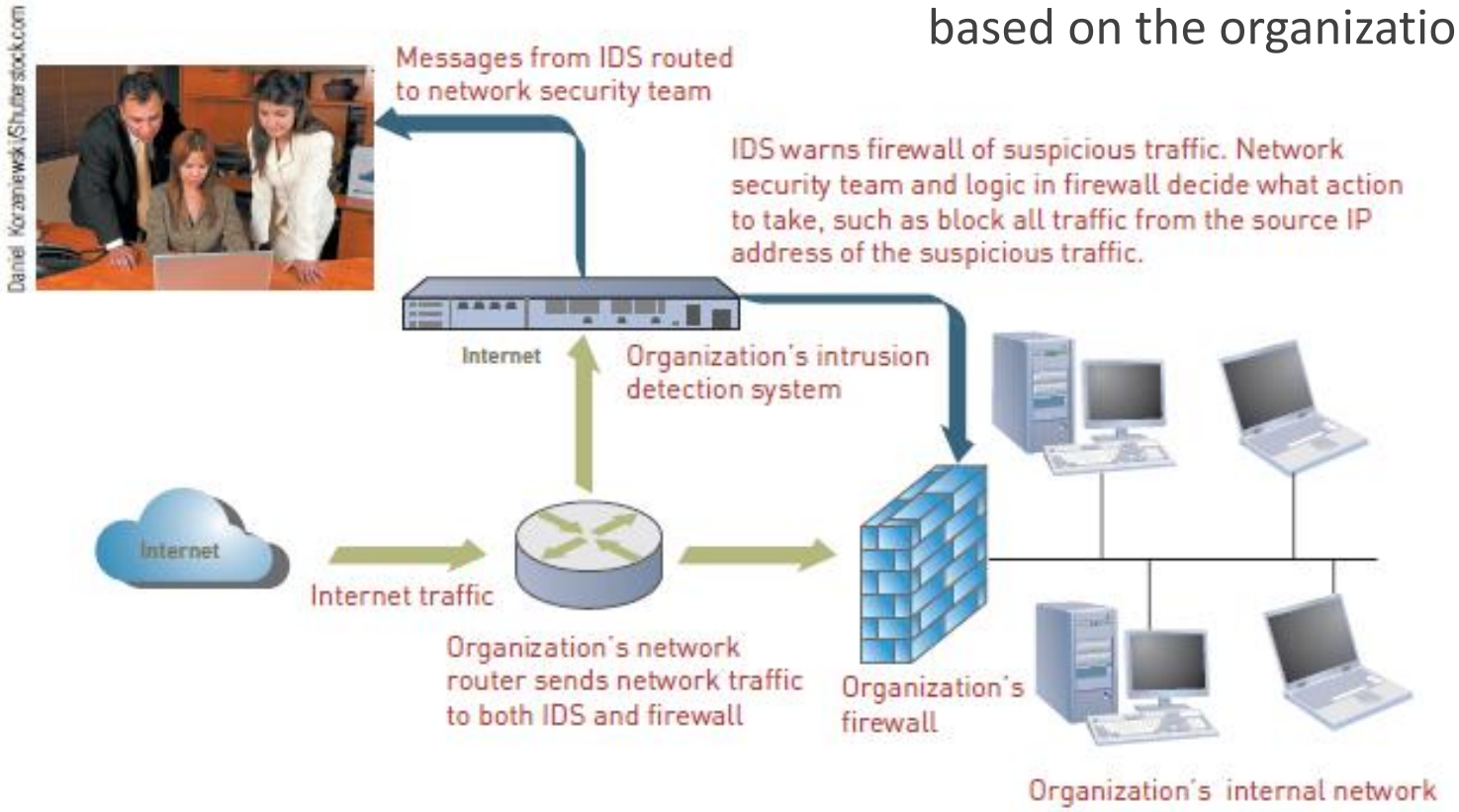
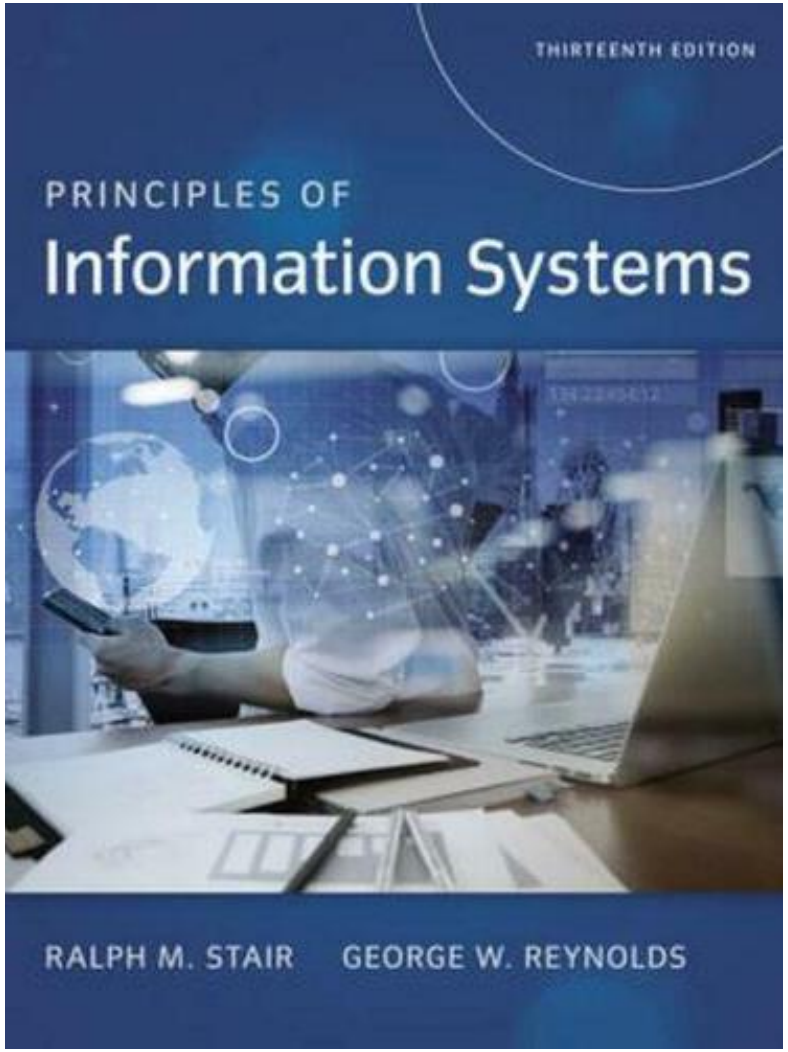


FIGURE 13.5
Intrusion detection system
An IDS notifies network security personnel when it detects network traffic that attempts to circumvent the security measures of a networked computer environment.

Computer Forensics

Computer Forensics

A discipline that combines elements of **law and computer science** to identify, collect, examine, and preserve data from computer systems, networks, and storage devices in a manner that **preserves the integrity** of the data gathered.



Chapter 14: Ethical, Legal, and Social Issues of Information Systems

Health Concerns

Avoiding Health and Environmental Problems

Ethical Issues

Privacy Issues

Health Concerns

Seated immobility thromboembolism (SIT)

- Formation of blood clots in the legs or lungs

Repetitive strain injury (RSI)

- An injury or disorder of the muscles, nerves, tendons, ligaments, or joints caused by repetitive motion

Carpal tunnel syndrome (CTS)

- Inflammation of the nerve that connects the forearm to the palm of the wrist

Occupational stress

- Anxieties about job insecurity, loss of control, incompetence, and demotion

Avoiding Health and Environmental Problems

Two primary causes of computer-related health problems are:

- A poorly designed work environment
- Failure to take regular breaks to stretch the muscles and rest the eyes

Work stressors are hazardous activities associated with unfavorable conditions of a poorly designed work environment

- Repetitive motion, awkward posture, and eye strain are examples

Ergonomics is the science of designing machines, products, and systems to maximize safety, comfort, and efficiency of people who use them

- Flexibility is a major component of ergonomics and an important consideration in the design of computer devices

Avoiding Health and Environmental Problems

Checklist to determine if properly seated at a correctly positioned keyboard:

- Your elbows are near your body in an open angle to allow circulation to the lower arms and hands
- Your arms are nearly perpendicular to the floor
- Your wrists are nearly straight
- The height of the surface holding your keyboard and mouse is 1 or 2 inches above your thighs
- The keyboard is centered in front of your body
- The monitor is about one arm's length (20 to 26 inches) away
- The top of your monitor is at eye level
- Your chair has a backrest that supports the curve of your lower (lumbar) back

FIGURE 14.4
Ergonomics
Developing certain ergonomically correct habits can reduce the risk of adverse health effects when using a computer.

Avoiding Health and Environmental Problems

TABLE **14.5** Avoiding common discomforts associated with heavy use of computers

Common Discomforts Associated with Heavy Use of Computers	Preventative Action
Red, dry, itchy eyes	Change your focus away from the screen every 20 or 30 minutes by looking into the distance and focusing on an object for 20 to 30 seconds.
	Make a conscious effort to blink more often.
	Consider the use of artificial tears.
	Use an LCD screen, which provides a better viewing experience for your eyes by eliminating most screen flicker while still being bright without harsh incandescence.
Neck and shoulder pain	Use proper posture when working at the computer.
	Stand up, stretch, and walk around for a few minutes every hour.
	Shrug and rotate your shoulders occasionally.
Pain, numbness, or tingling sensation in hands	Use proper posture when working at the computer.
	Do not rest your elbows on hard surfaces.
	Place a wrist rest between your computer keyboard and the edge of your desk.
	Take an occasional break and spread fingers apart while keeping your wrists straight.Taken an occasional break with your arms resting at your sides and gently shake your hands.

Ethical Issues in Information Systems

Ethical issues: deal with what is generally considered **right or wrong**

Ethical behavior conforms to generally accepted social norms

- **Morals** are one's personal beliefs about right and wrong
- **Law** is a system of rules that tells us what we can and cannot do
- A **code of ethics**: States the principles and core values essential to a set of people and, therefore, govern their behavior

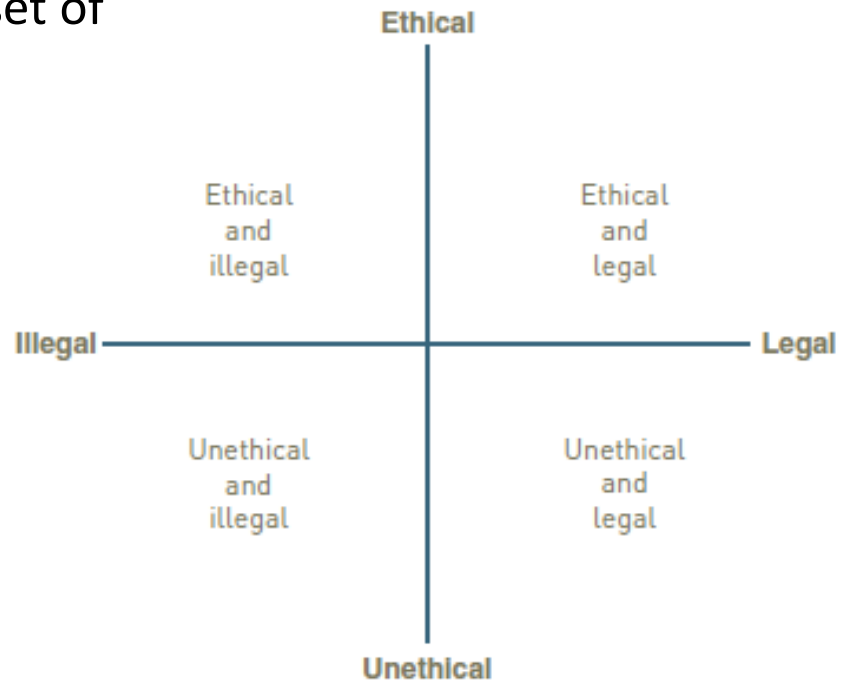


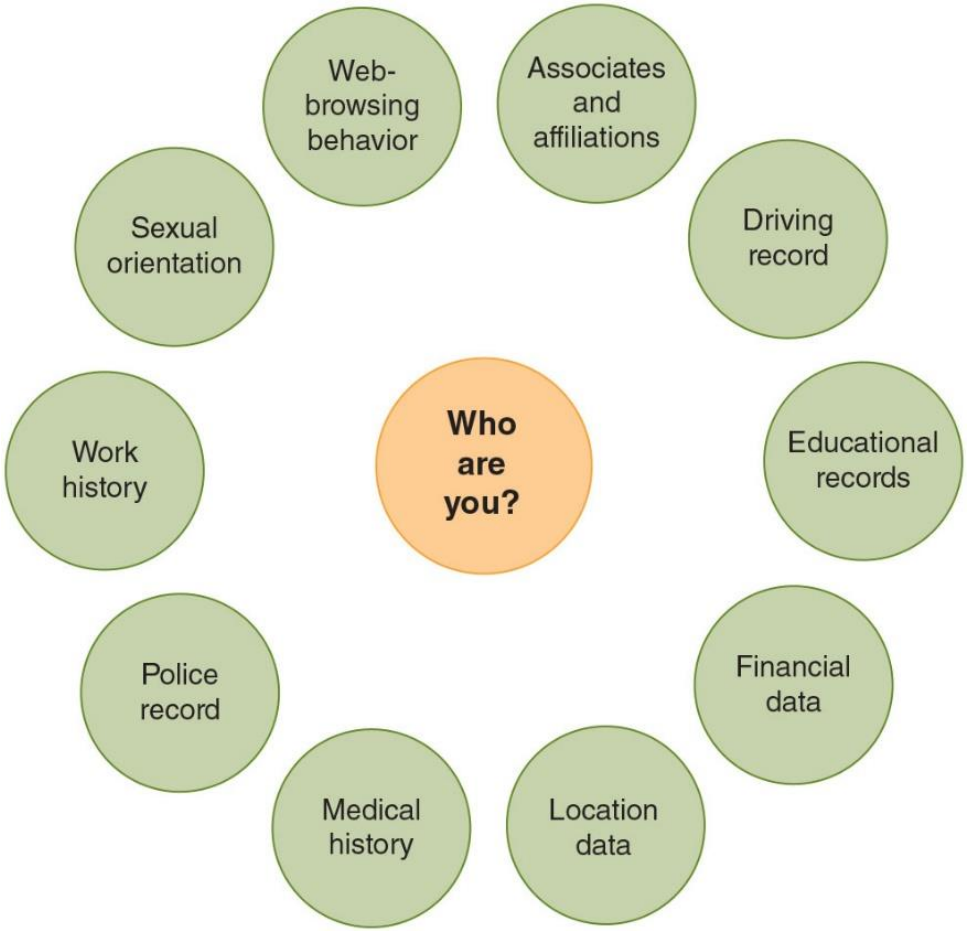
FIGURE 14.7
Legal versus ethical
Just because an activity is defined as legal does not mean that it is ethical.

Privacy Issues

Issue of **privacy** deals with the **right to be left alone or to be withdrawn** from public view

Data is constantly being collected and stored on each of us

- The data is often distributed over easily accessed networks without our knowledge or consent
- Who owns this information and knowledge?



Governments and organizations gather a variety of data about people

Measures Protecting Personal Data: practices, regulations, policies, acts

- Fair information practices
- General Data Protection Regulation (GDPR)
- Fair Credit Reporting Act, Right to Financial Privacy Act, Fair and Accurate Credit Transactions Act
- Health Insurance Portability and Accountability Act (HIPAA)
- Communications Decency Act (CDA)
- Family Educational Rights and Privacy Act (FERPA)
- Children's Online Privacy Protection Act (COPPA)
- Children's Internet Protection Act (CIPA)
- Foreign Intelligence Surveillance Act (FISA)

Group exercises

Form groups and let every group focus on resolving one case

- Hiring a Black Hat Hacker (p. 576)
- Spear-Phishing Attack! (pp. 588)
- Cutting Down on Cyberloafing (p. 605)
- Demanding Role of the Care Manager (p. 621)