CHAPTER 8

Wireless, Mobile Computing and Mobile Commerce

CHAPTER OUTLINE

Chapter Opening Case: The Battle for the Mobile Wallet

Pay

PayPal

Google wallet

Source: Slavoljub Pantelic/ Shutterstock

8.1 Wireless Technologies

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How many smart phones are now being used worldwide?

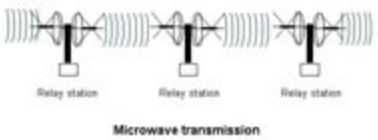
Capabilities of Wireless Devices

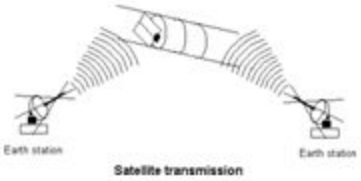
- Cellular telephony
- Bluetooth
- Wi-Fi
- Digital camera
- Global positioning system
- MP3 music player
- Address book
- E-mail access
- Short message service
- Instant messaging
- Text messaging
- Organize
- Video player
- Internet access

What problems might companies have with personal smartphones?

Wireless Transmission Media

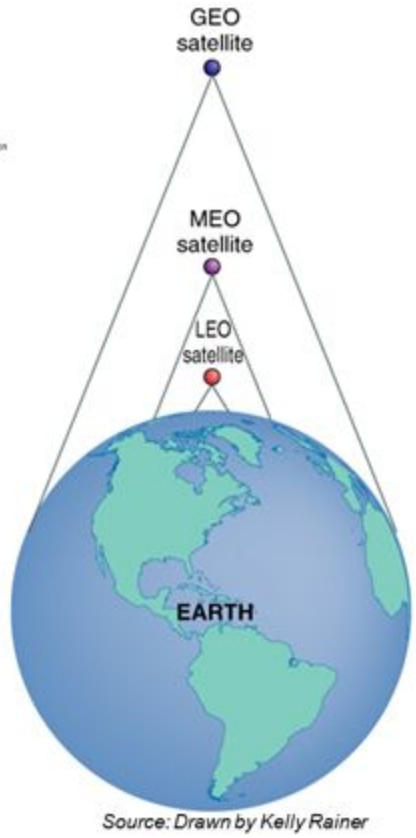
Microwave Transmission





Satellite transmission

- Geostationary Orbit (GEO)
  - Internet over Satellite
- Middle Earth Orbit (MEO)
  - Global Positioning System
- Low Earth Orbit (LEO)
  - Satellite Communications



Source: Drawn by Kelly Rainer

How the Global Positioning System Works

Wireless Transmission Media (continued)

Radio

Satellite Radio

Infrared

8.2 Wireless Computer Networks and Internet Access

1. Short range wireless networks
2. Medium range wireless networks
3. Wide area wireless networks

8.2.1 Short Range Wireless Networks

Bluetooth

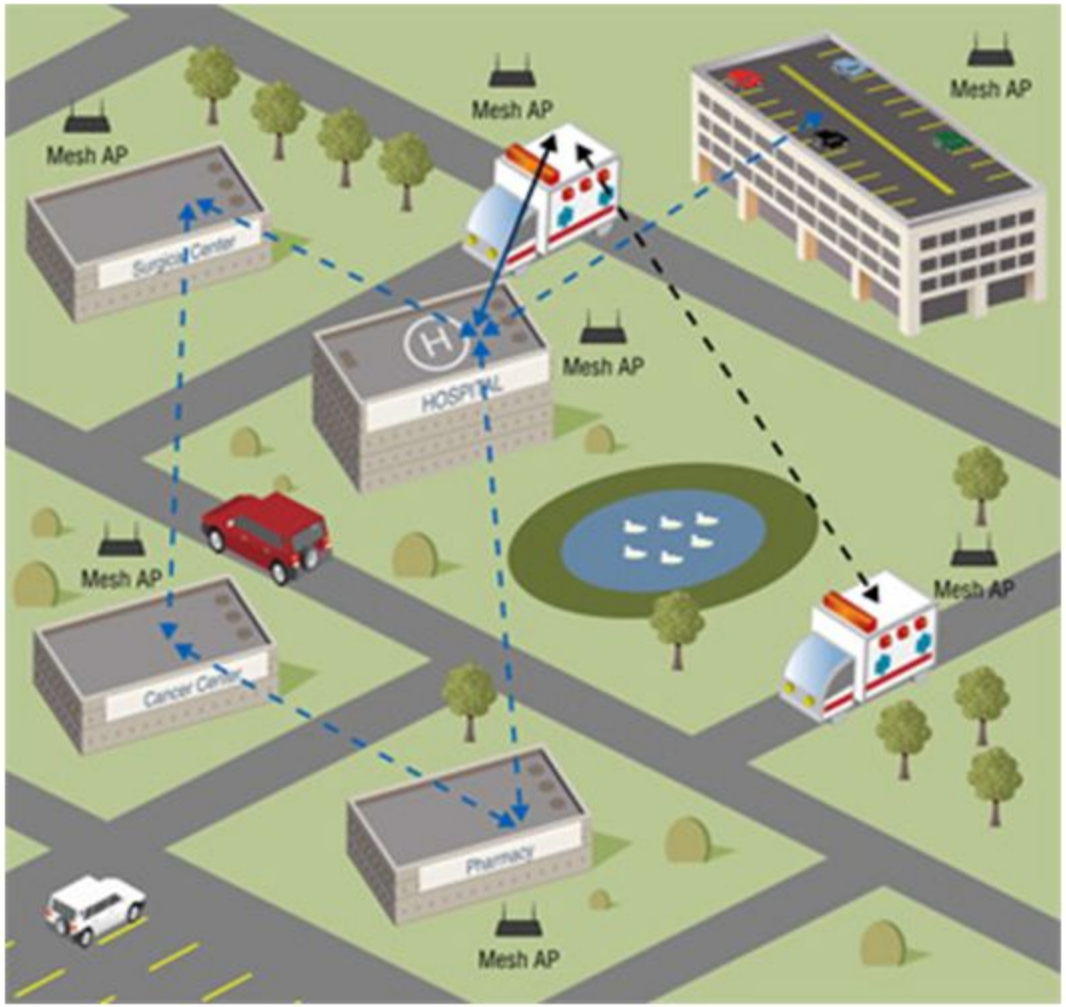
Near-field Communications

8.2.2 Medium Range Wireless Networks

Wireless fidelity (Wi-Fi)

- Wireless access point
- Hotspot
- Wireless network interface card

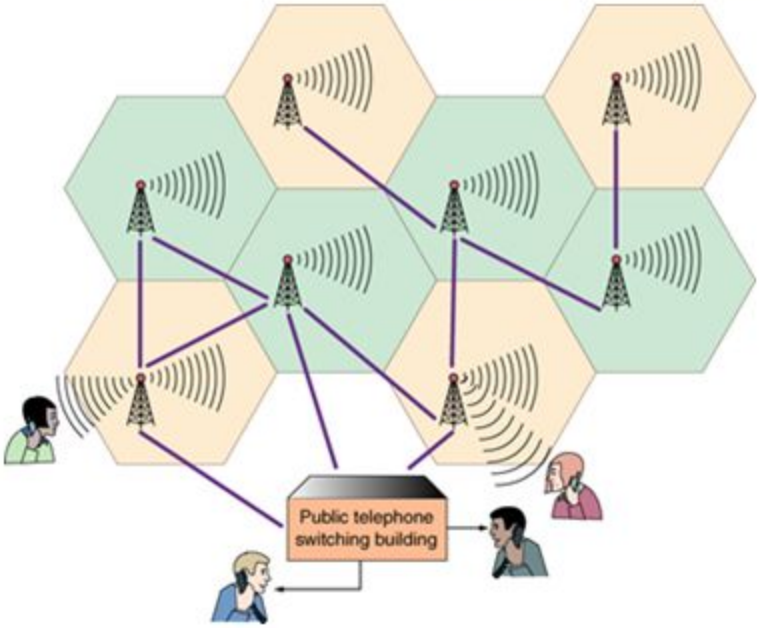
8.2.2 Medium Range Networks: Wireless Mesh Networks



8.2.3 Wide-Area Wireless Networks

Cellular Radio

- 1st Generation
- 2nd Generation
  - 3rd Generation (3G)
- 4th Generation (4G)



Wireless Broadband or WiMax (WiFi on steroids)

8.3 Mobile Computing

Basis of mobile computing:

- **Mobility**
- **Broad reach**

Five value-added mobile computing attributes:

1. **Ubiquity**
2. **Convenience**
3. **Instant connectivity**
4. **Personalization**
5. **Localization of products and services**

8.4 Mobile Commerce

The development of m-commerce is driven by the following factors:

- **Widespread availability of mobile devices**
- **No need for a PC**
- **The "Cell phone culture"**
- **Declining prices**
- **Bandwidth improvement**

Mobile Commerce Applications

- **Location-Based Applications and Services**
- **Financial Services**
- **Intrabusiness Applications**
- **Accessing Information**
- **Telemetry Applications**

Location-Based Applications

Shopping from Wireless Devices

Location-based Advertising

Location-based Services

Financial Services

- **Wireless Electronic Payment System**
- **Mobile Banking**
- **Wireless Bill Payments**
- **Mobile Wallet**
- **Micropayments**

Frederic Lucano/Stone/Getty Images, Inc.

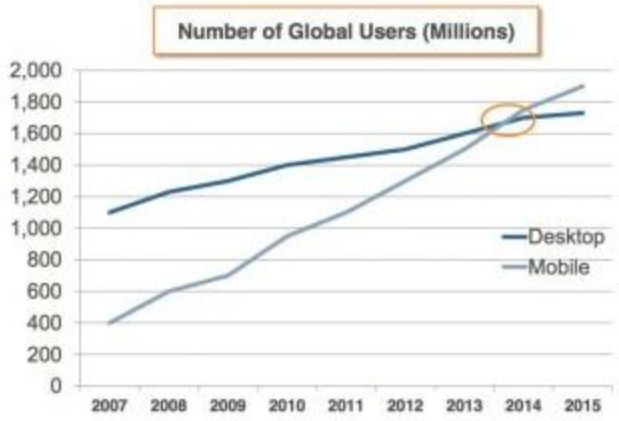
Intrabusiness Applications

Example: UPS

Accessing Information

Mobile Internet

Apps vs. Web Browser: who's winning?



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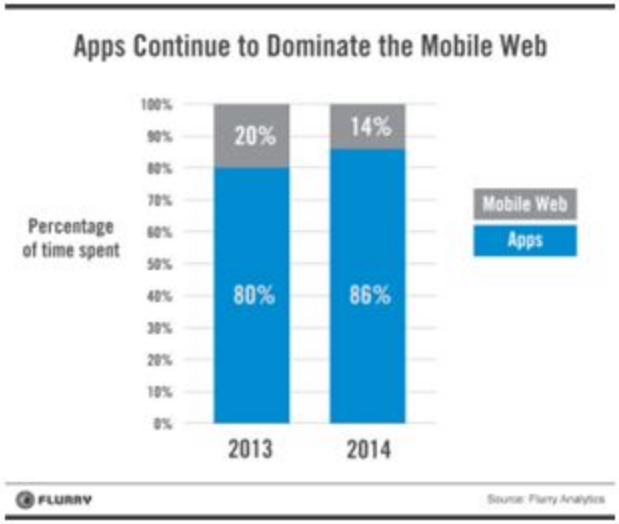

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Telemetry

Examples of Telemetry Applications

- Medicine
- Automobiles
- Find My iPhone

Telemedicine predicted in 1924

OnStar®

8.5 Pervasive Computing

- **Radio frequency identification (RFID)**
- **Wireless Sensor Networks (WSNs)**

Bar Code, QR Code, RFID

Source: Media Bakery

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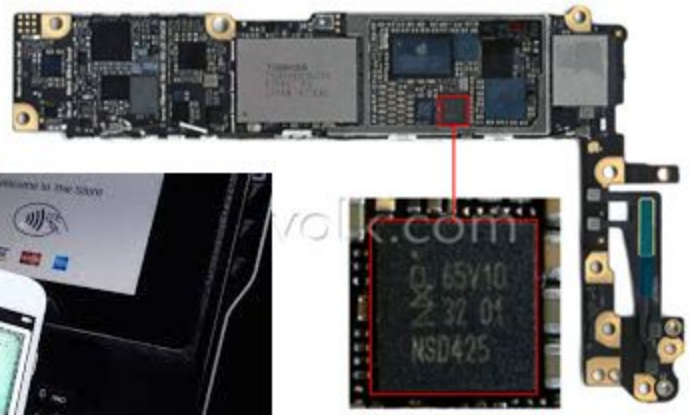

NFC NXP Chip

Small RFID Reader and Tag

See video

Coming soon to a supermarket near you

8.6 Wireless Security

Four major threats

1. Rogue access point
2. War driving
3. Eavesdropping
4. RF (Radio frequency) jamming

Chapter Review

Describe the four main types of wireless transmission media.

- **Microwave**
- **Satellite**
- **Radio**
- **Infrared**

Chapter Review

Discuss the basic purposes of short-range, medium-range, and long-range networks, and explain how businesses can use at least one technology employed by each type of network.

- **Short-range: near field communications**
- **Medium-range: WiFi technologies**
- **Long-range: Cellular networks**

Chapter Review (continued)

Discuss the five major m-commerce applications, and provide a specific example of how each application can benefit a business.

- **Location-Based Applications and Services**
- **Financial Services**
- **Intrabusiness Applications**
- **Accessing Information**
- **Telemetry Applications**

Chapter Review (continued)

Define pervasive computing, describe one technologies that underlies this technology, and provide at least one example of how a business can utilize each one.

Radio Frequency Identification

Chapter Review (continued)

Identify the four major threats to wireless networks, and explain, with examples, how each one can damage a business.

1. **Rogue access point**
2. **War driving**
3. **Eavesdropping**
4. **RF (Radio frequency) jamming**