Chapter 4

Networking: Discovery, Communication, Collaboration

Information Technology For Management 6th Edition

Turban, Leidner, McLean, Wetherbe

Lecture Slides by L. Beaubien, Providence College

John Wiley & Sons, Inc.

Learning Objectives

- Discuss the characteristics and standards of network computing
- Explain the benefits of interoperability and converged networks
- Describe the role of intranet and extranet portals and how they support supply chain management
- Understand the role of discovery, communication, and collaboration capabilities for organizations

Learning Objectives (Continued)

- Describe how new communication technologies are replacing or filling the gaps left by conventional technologies
- Describe how IT-based collaboration and communication support group work and decision making
- Describe the fundamental principals and capabilities of group work technologies
- Evaluate the managerial, social, and ethical issues related to the use of network computing, messaging, and collaboration

Local Area Network (LAN)

- **LAN** consists of the following components:
  - **LAN file server** is a repository of various software and data files for the network
  - **Nodes** are the client machines on the LAN
  - Wired or wireless communication media that connects the devices

Local Area Network (Continued)

- **LAN network interface card (NIC)** is a special adapter that links an individual device to the communication medium and specifies:
  - The rate of data transmission;
  - The size of the message units;
  - Addressing information attached to each message
  - The network topology
- **Network operating system (NOS)** manages the server and routes and manages communications on the network.

Wide Area Network (WAN)

- **Wide area networks (WANs)** are networks that cover large geographic areas.
  - WANs typically connect multiple LANs
  - WANs have large capacity and combine multiple channels (fiber optic, satellite, microwave, etc.)
  - WANs are provided by common carriers, such as telephone companies (Sprint, AT&T, etc.)
- **Value-added network (VAN)** are private, data-only networks managed by outside third-parties that provide these networks to multiple organizations.

Going Wireless

- Wifi - simple wireless networks
- WLAN - expanding the wireless connection
- WiMax - Long-range wireless

Network Topologies

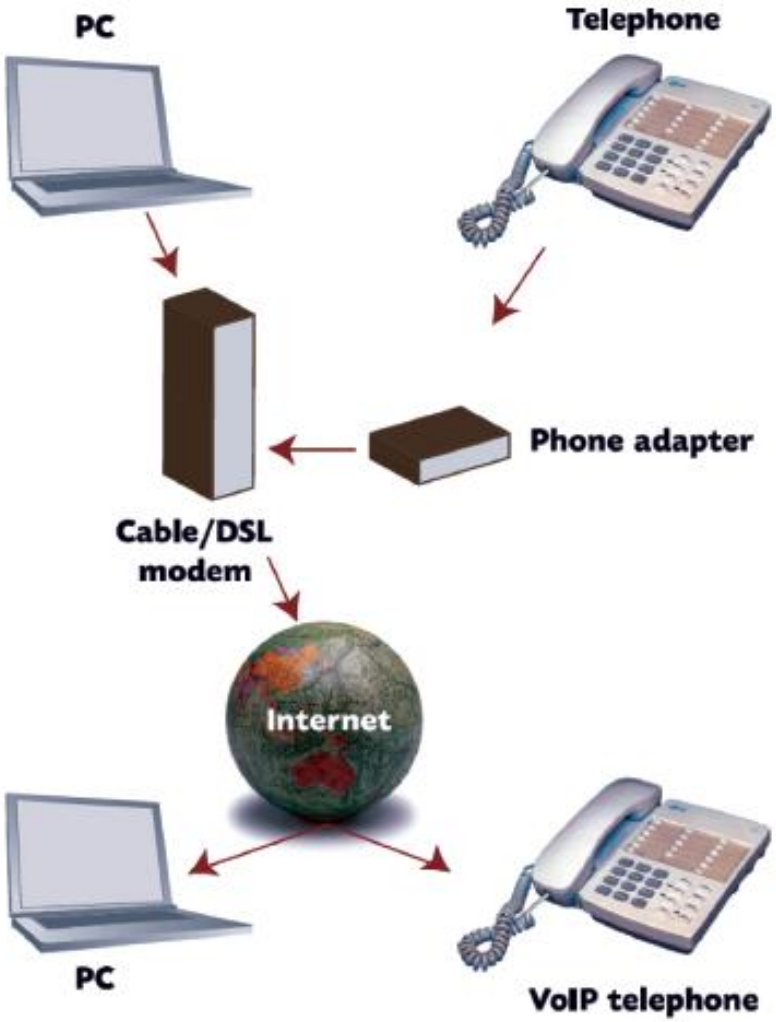
- **Star**, all network nodes connect to a single computer, typically the file server
- **Bus**, all network nodes connect to the *bus,* which is a single communications channel, such as twisted pair, coaxial cable, or fiber optic cable
- **Ring**, network nodes are connected to adjacent nodes to form a closed loop

Enterprise Networking

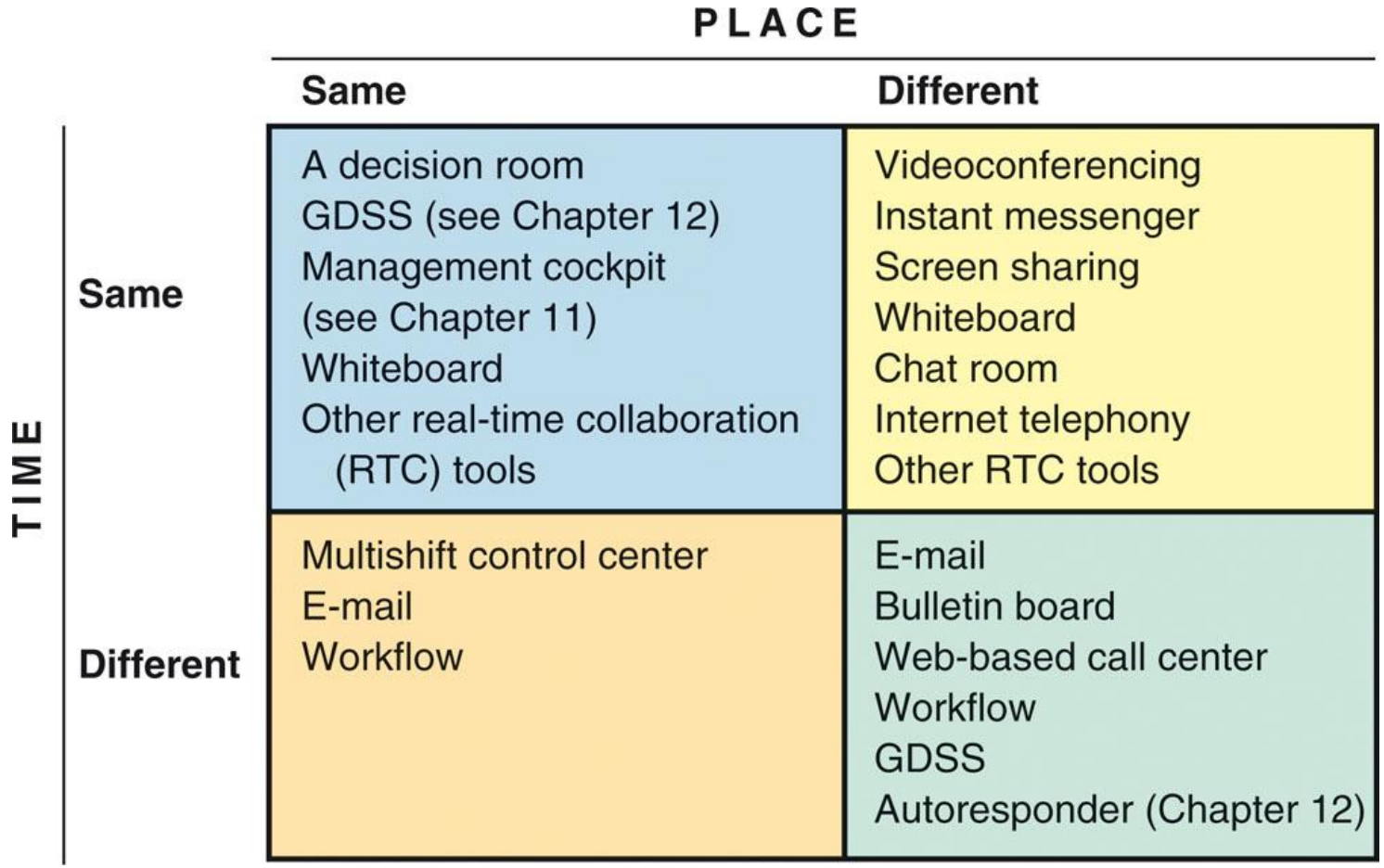
- **Enterprise network** is an organization's interconnected network of multiple LANs and also can include multiple WANs

- **Backbone networks** are corporate high-speed central networks to which multiple smaller networks such as LANs called *embedded LANs* and smaller WANs connect

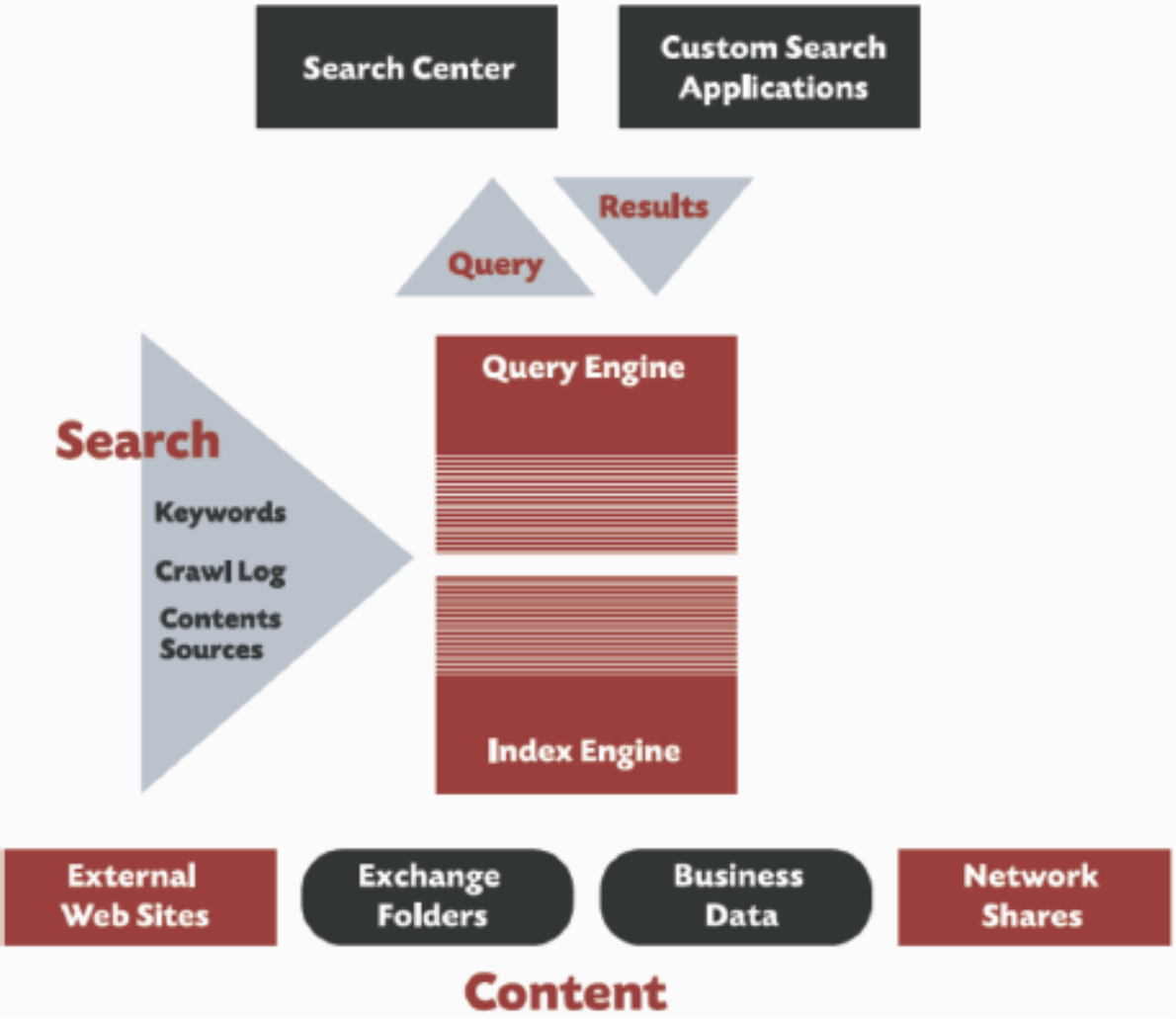
The Network Computing Infrastructure



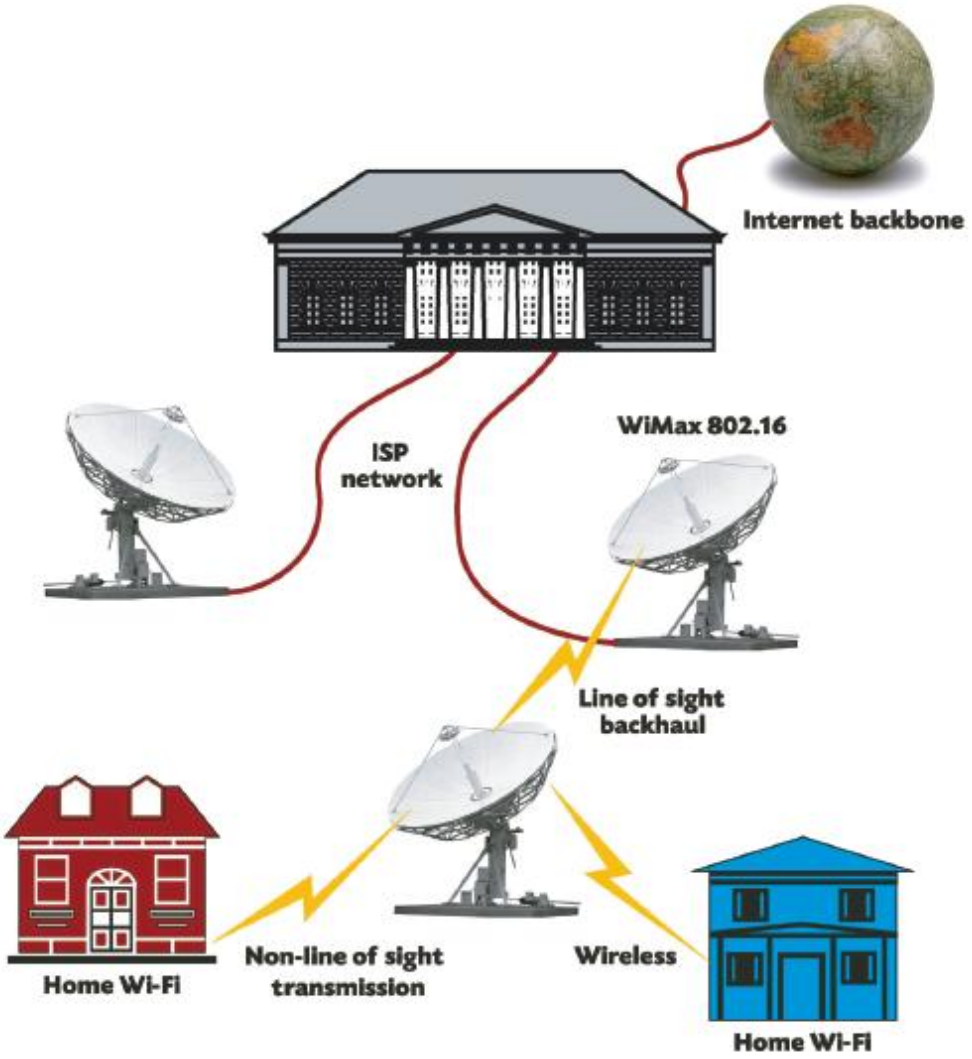
Framework for IT support of Communication



Finding Information



The Dis-connected Connected



Managerial Issues

- **Organizational Impacts:** Changes in Communication forms
- **Future of Technology Support:** Movement toward more collaboration
- **Extending Organizational Boundaries:** Growing Reach of Organizations
- **Virtual Work:** Dispersed Organizations and the worker
- **Single view of the Truth:** improving information integrity
- **Social and Ethical Issues**

Chapter 4

Chapter 4B

Mobile, Wireless and Pervasive Computing

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Lecture Slides by L. Beaubien, Providence College

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Learning Objectives

- Discuss the characteristics and attributes of mobile computing and m-commerce
- Describe the drivers of mobile computing
- Understand the technologies that support mobile computing
- Describe wireless standards and transmission networks
- Discuss m-commerce applications in financial and other services, advertising, and providing of content
- Describe the applications of m-commerce within organizations

Learning Objectives (Continued)

- Describe consumer and personal applications of m-commerce
- Describe some non-Internet m-commerce applications
- Describe location-based commerce (l-commerce)
- Discuss the key characteristics and current uses of pervasive computing
- Describe the major inhibitors and barriers of mobile computing and m-commerce

Mobile Computing – Value Chain

M-commerce is a complex process involving a number of operations and entities (customers, merchants, mobile operators, etc.).

Link	Function	Provider
Transport	Maintenance and operation of the infrastructure supporting data communication between mobile users and application providers	Technology platform vendors
Enabling services	Server hosting, data backup, and system integration	Infrastructure equipment vendors
Transaction support	Mechanisms for assisting with transactions, security, and billing	Application platform vendor
Presentation services	Conversion of content of Internet-based applications to applications suitable for mobile devices	Application developer
Personalization support	Gathering of users' preferences, information, and devices in order to provide individualized applications	Content developer
User applications	General and specialized applications for mobile users	Mobile service provider
Content aggregators	Design and operation of portals that offer categorized information and search facilities	Mobile portal provider

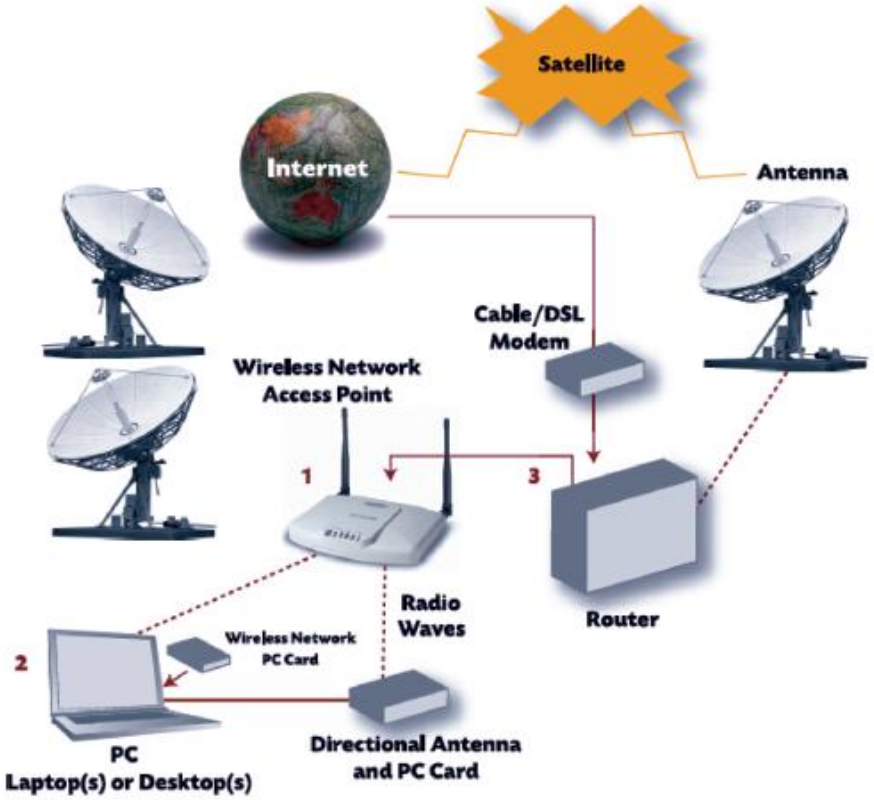
Problems with Wi-Fi

- **Roaming** – users cannot roam from hotspot to hotspot if the hotspots use different Wi-Fi network services
- **Security** – because Wi-Fi uses radio waves, it is difficult to protect
- **Cost** – commercial Wi-Fi services are low cost but not free and each service has its own fees and separate accounts for users to logon

WiMax

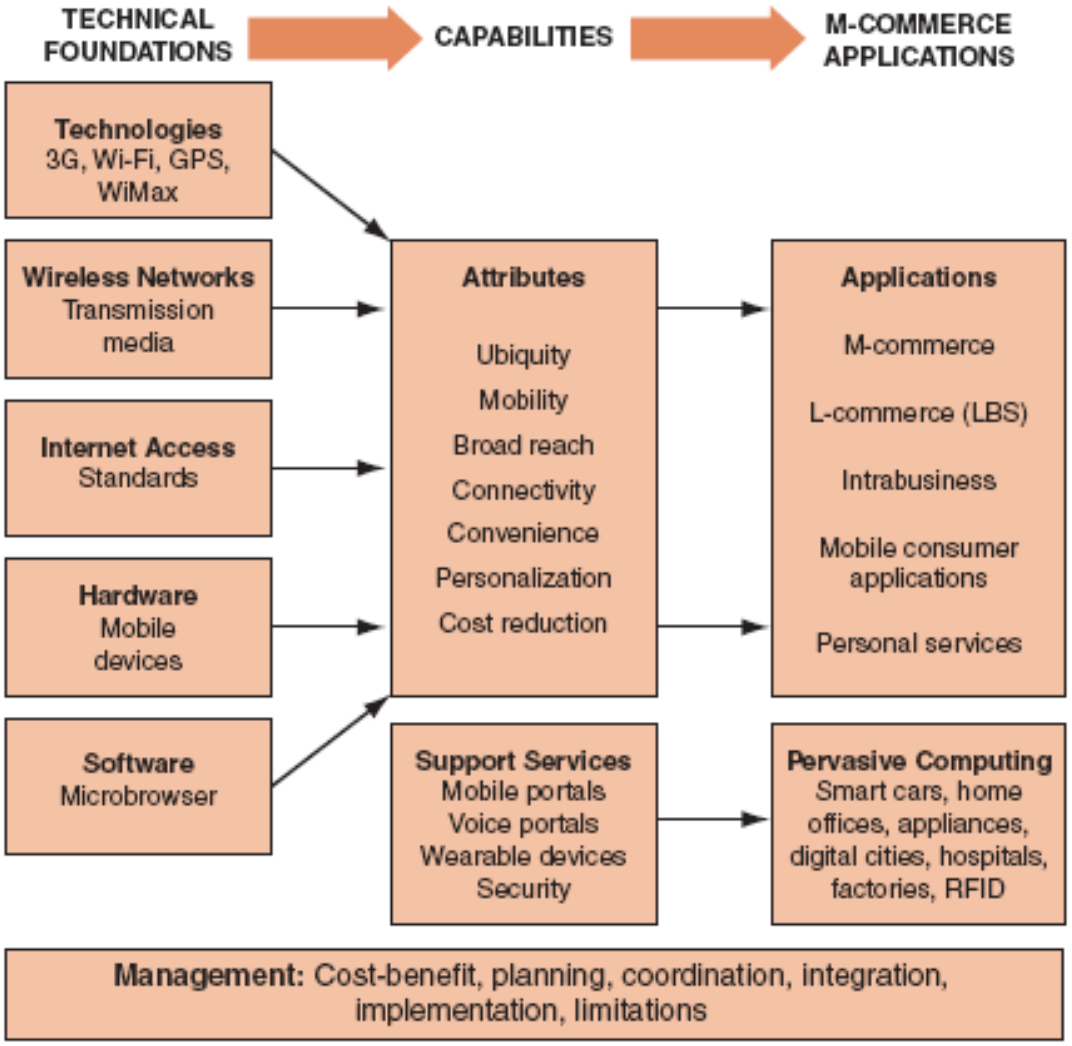
- **Worldwide Interoperability for Microwave Access**, popularly known as **WiMax**, is the name for IEEE standard 802.16
  - Wireless access range of up to 31 miles;
  - Data transfer rate of 75 Mbps;
  - Secure system that offers voice and video.

Mobile Computing Infrastructure – WWAN's

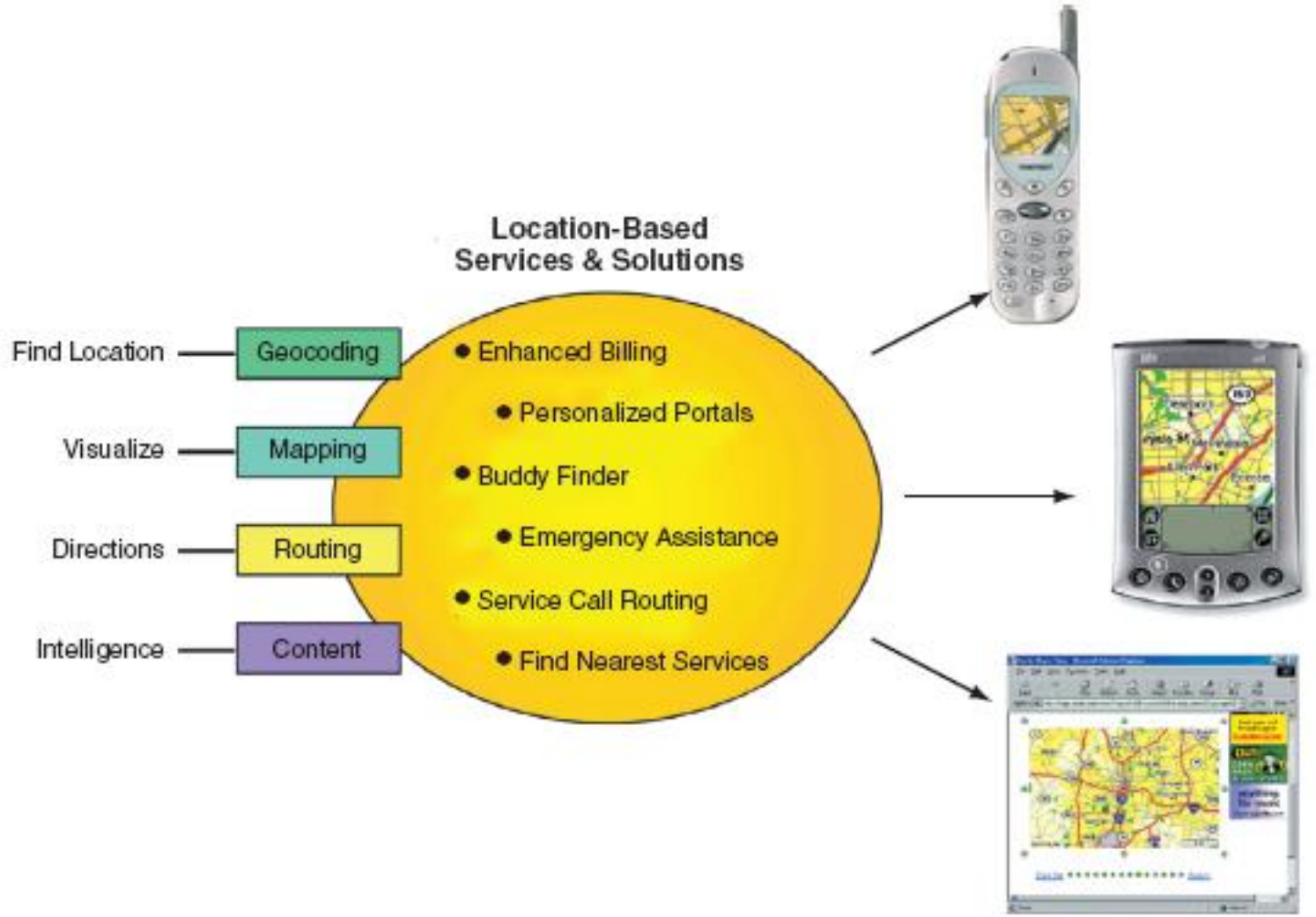


1. Radio-equipped access point connected to the internet (or via a router). It generates and receives radio waves (up to 400 feet).
2. Several client devices, equipped with PC cards, generate and receive radio waves.
3. Router is connected to the internet via a cable or DSL modem, or is connected via a satellite.

Landscape of Mobile Computing



Mobile Computing – L-Commerce Applications



Managerial Issues

- **Comparing wireless to synchronized mobile devices.** In many cases, transmitting data in the evening or using a docking device is sufficient. In others, real time communication is needed, justifying a wireless system.
- **Timetable.** Although there has been much hype about m-commerce, only a small number of large-scale mobile computing applications have been deployed to date. The most numerous applications are in e-banking, stock trading, emergency services, and some B2B tasks. Companies still have time to carefully craft an m-commerce strategy.
- **Setting applications priorities.** Finding and prioritizing applications is a part of an organization's e-strategy. Although location-based advertising is logically attractive, its effectiveness may not be known for several years. Therefore, companies should be very careful in committing resources to m-commerce. For the near term, applications that enhance the efficiency and effectiveness of mobile workers are likely to have the highest payoff.

Managerial Issues (Continued)

- **Just a buzzword?** In the short run, mobile computing, m-commerce, and especially l-commerce, may be just buzzwords due to the many limitations they now face. However, in the long run, the concepts will be increasingly popular. Management should monitor the technological developments and make plans accordingly.
- **Choosing a system.** The multiplicity of standards, devices, and supporting hardware and software can confuse a company planning to implement mobile computing. An unbiased consultant can be of great help. Checking the vendors and products carefully, as well as who is using them, is also critical.

Chapter 4B