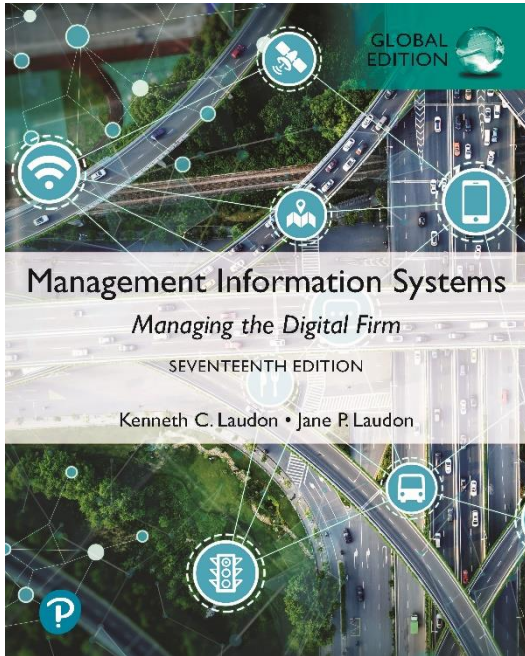


Management Information Systems: Managing the Digital Firm

Seventeenth Edition, Global Edition



Chapter 5

IT Infrastructure and Emerging
Technologies

Learning Objectives

5.1 What is IT infrastructure

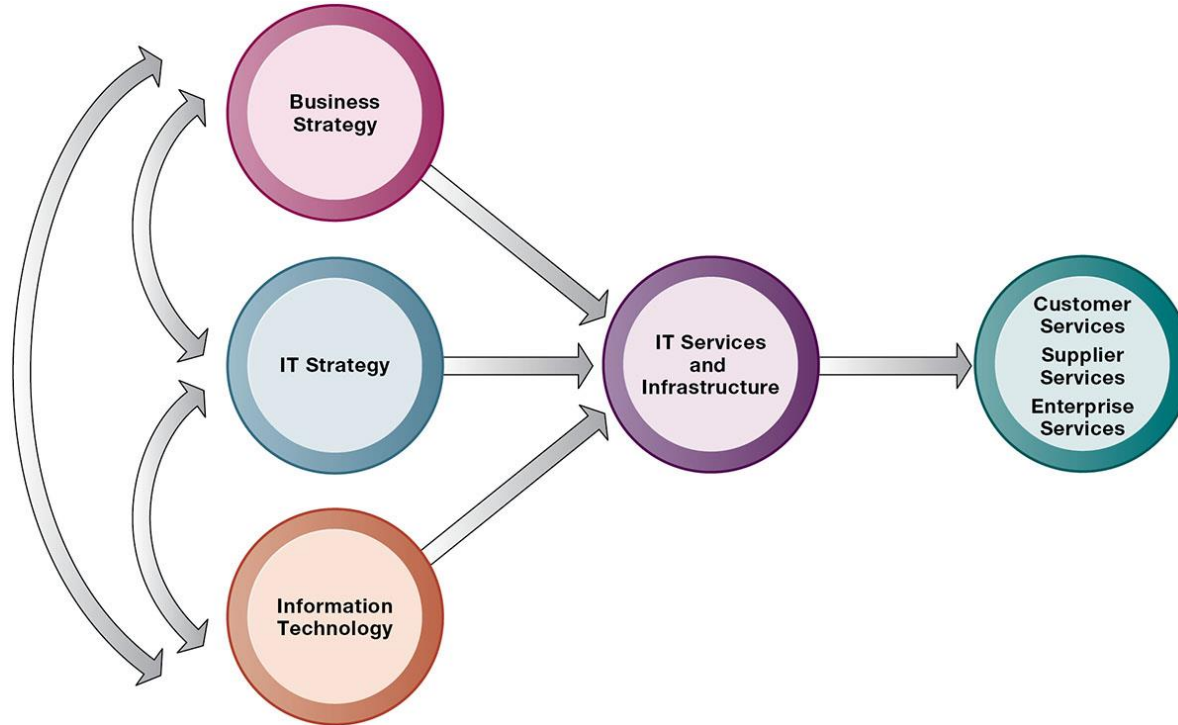
5.2 What are the current trends in computer hardware platforms?

5.3 What are the current computer software platforms and trends?

Defining IT Infrastructure

- Set of physical devices and software required to operate an enterprise
- Set of firm-wide services including:
 - Computing platforms providing computing services
 - Physical facilities management services
 - IT management, education, and other services
- “Service platform” perspective
 - More accurate view of value of investments

Figure 5.1 Connection Between the Firm, IT Infrastructure, and Business Capabilities



Evolution of IT Infrastructure

- General-purpose mainframe and minicomputer era: 1959 to present
- Personal computer era: 1981 to present
- Client/server era: 1983 to present
- Enterprise computing era: 1992 to present
- Cloud and mobile computing: 2000 to present

Technology Drivers of Infrastructure Evolution (1 of 2)

- Moore's law and microprocessing power
 - Computing power doubles every 2 years
 - Nanotechnology
- Law of Mass Digital Storage
 - The amount of data being stored each year doubles
- Metcalfe's Law and network economics
 - Value or power of a network grows exponentially as a function of the number of network members

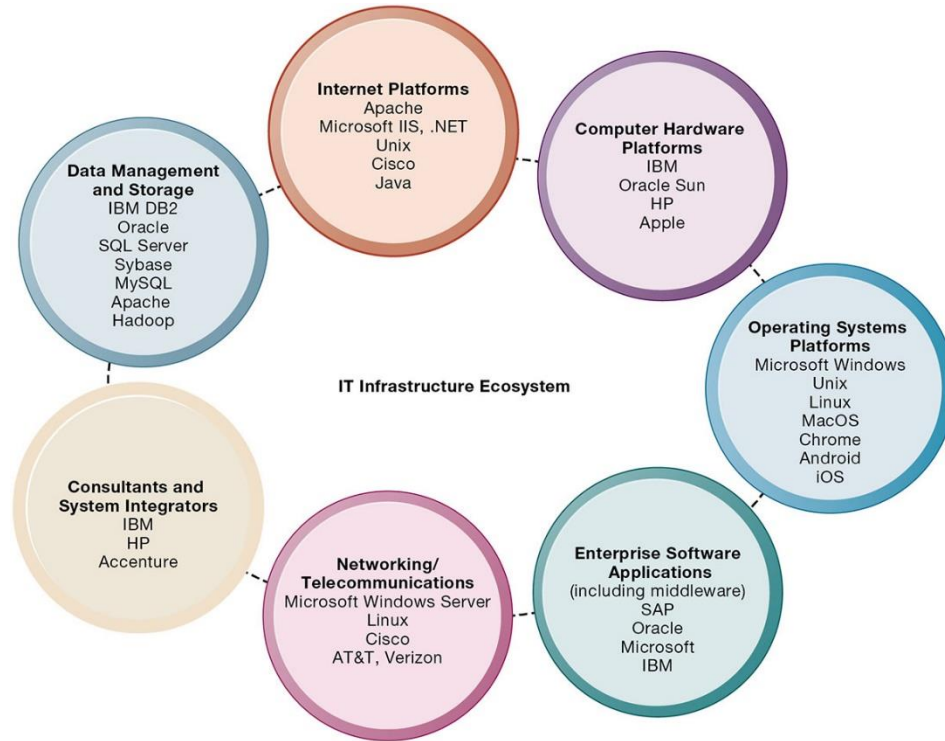
Technology Drivers of Infrastructure Evolution (2 of 2)

- Declining communication costs and the Internet
 - Exponential growth in size of the Internet
- Standards and network effects
 - Technology standards
 - Specifications that establish the compatibility of products and the ability to communicate in a network
 - Unleash powerful economies of scale and result in price declines

What Are the Components of IT Infrastructure?

1. Computer hardware platforms
2. Operating system platforms
3. Enterprise software applications
4. Data management and storage
5. Networking/telecommunications platforms
6. Internet platforms
7. Consulting system integration services

Figure 5.8 The IT Infrastructure Ecosystem



Consulting and System Integration Services

- Even large firms do not have resources for full range of support for new, complex infrastructure
- Leading consulting firms: Accenture, IBM Global Services, HP, Infosys, Wipro Technologies
- Software integration: ensuring new infrastructure works with legacy systems
- Legacy systems: older TPS created for mainframes that would be too costly to replace or redesign

What Are the Current Trends in Computer Hardware Platforms? (1 of 5)

- The mobile digital platform
 - Smartphones
 - Tablet computers
 - Digital e-book readers and apps (Kindle)
 - Wearable devices
- Consumerization of IT and BYOD (bring your own device)
 - Forces businesses and IT departments to rethink how IT equipment and services are acquired and managed

What Are the Current Trends in Computer Hardware Platforms? (2 of 5)

- Quantum computing
 - Uses quantum physics to represent and operate on data
 - Dramatic increases in computing speed
- Virtualization
 - Allows single physical resource to act as multiple resources (i.e., run multiple instances of OS); also enables multiple physical resources (such as storage devices) to appear as a single logical resource (such as in software-defined storage (SDS))
 - Reduces hardware and power expenditures
 - Facilitates hardware centralization

What Are the Current Trends in Computer Hardware Platforms? (3 of 5)

- Cloud computing
 - On-demand computing services obtained over network
 - Infrastructure as a service (IaaS)
 - Software as a service (SaaS)
 - Platform as a service (PaaS)
 - Cloud can be public or private
 - Allows companies to minimize IT investments
 - Drawbacks: Concerns of security, reliability
 - Hybrid cloud computing model

Figure 5.9 Cloud Computing Platform

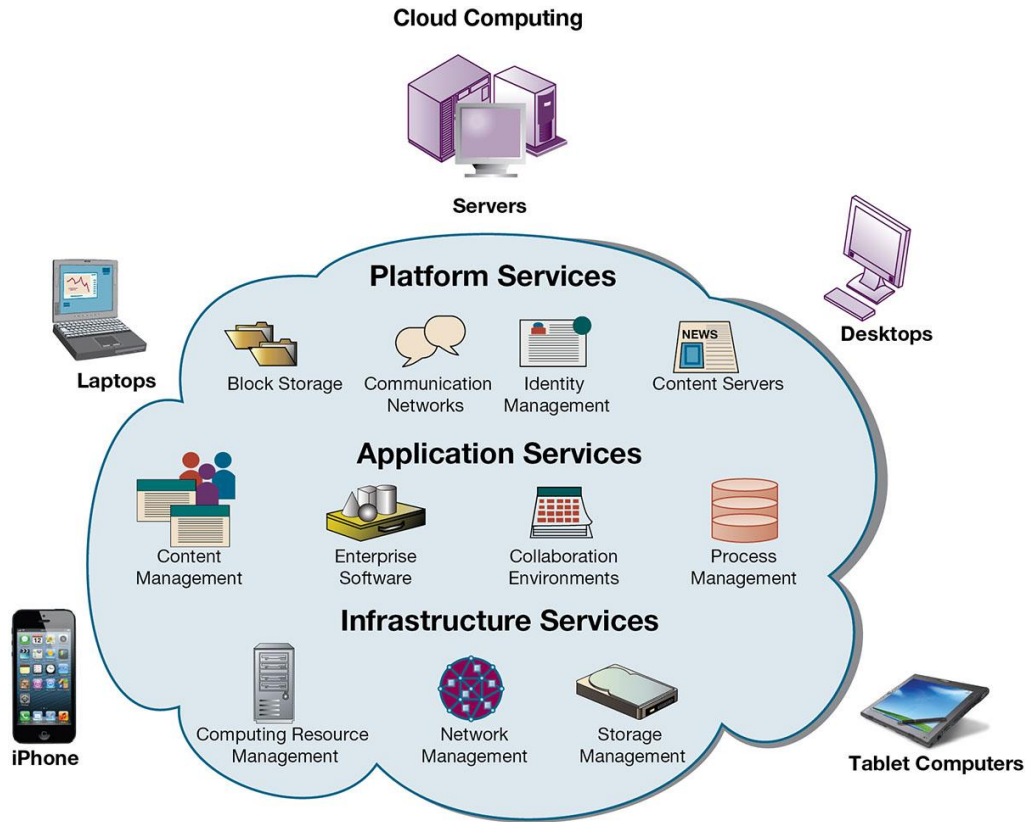
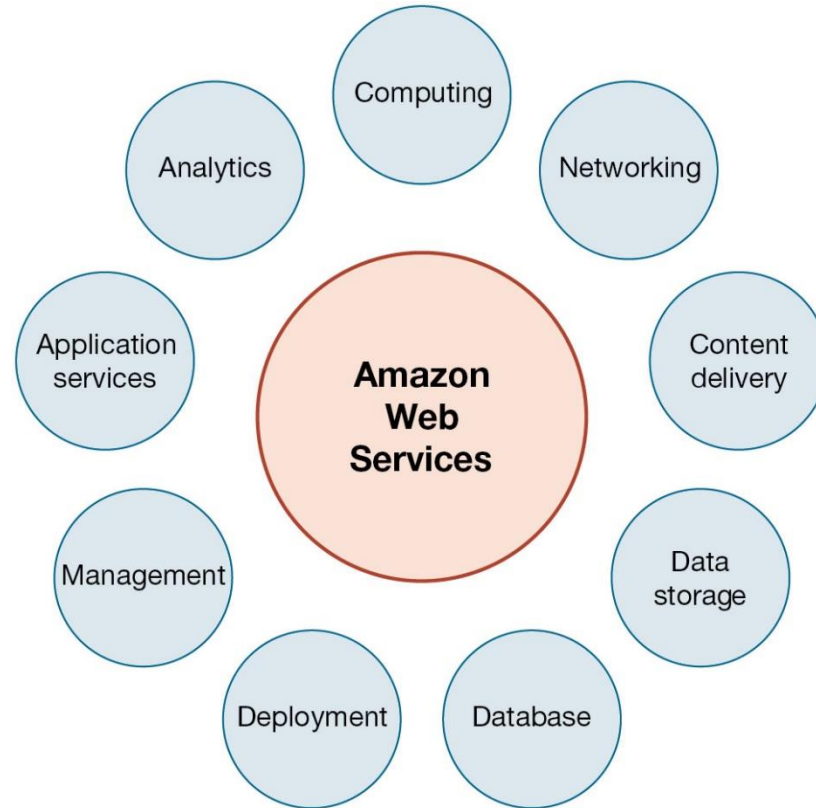


Figure 5.10 Amazon Web Services



What Are the Current Trends in Computer Hardware Platforms? (4 of 5)

- Edge computing
 - Servers at the edge of the network, near the source of the data
 - Reduces latency and network traffic

What Are the Current Trends in Computer Hardware Platforms? (5 of 5)

- Green computing (Green IT)
 - Practices and technologies for manufacturing, using, disposing of computing and networking hardware
 - Reducing power consumption a high priority
 - Green data centers
- High-performance, power-saving processors
 - Multicore processors: a single chip with two or more processing units (**cores**) that can work simultaneously, allowing faster and more efficient multitasking and performance.
 - Power-efficient microprocessors: designed to deliver computational performance while minimizing power consumption

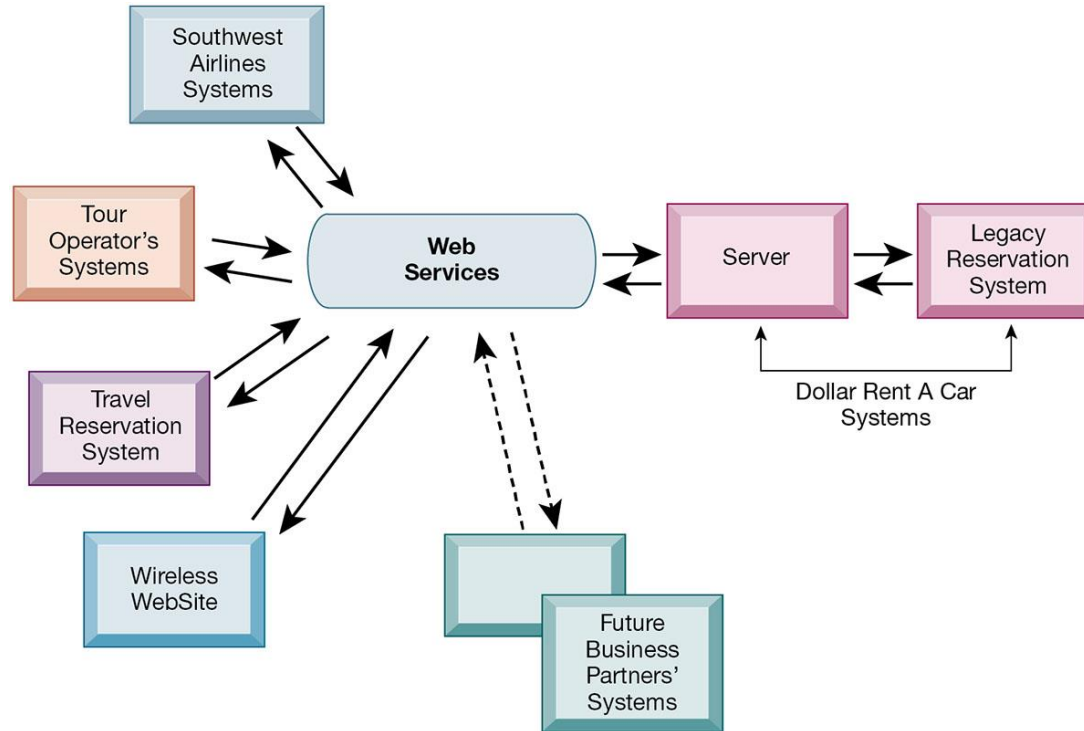
What Are the Current Computer Software Platforms and Trends? (1 of 3)

- Linux and open-source software
 - Produced by community of programmers
 - Examples: Apache web server, Mozilla Firefox browser, OpenOffice
 - Linux
- Software for the web: Java, HTML, and HTML5
 - Java Virtual Machine
 - Web browsers
 - HTML and HTML5
 - Ruby and Python

What Are the Current Computer Software Platforms and Trends? (2 of 3)

- Web services and service-oriented architecture
 - Web services
 - XML: Extensible Markup Language
 - SOA: service-oriented architecture
 - Set of self-contained services that communicate with one another to create a working software application
 - Software developers reuse these services in other combinations to assemble other applications as needed

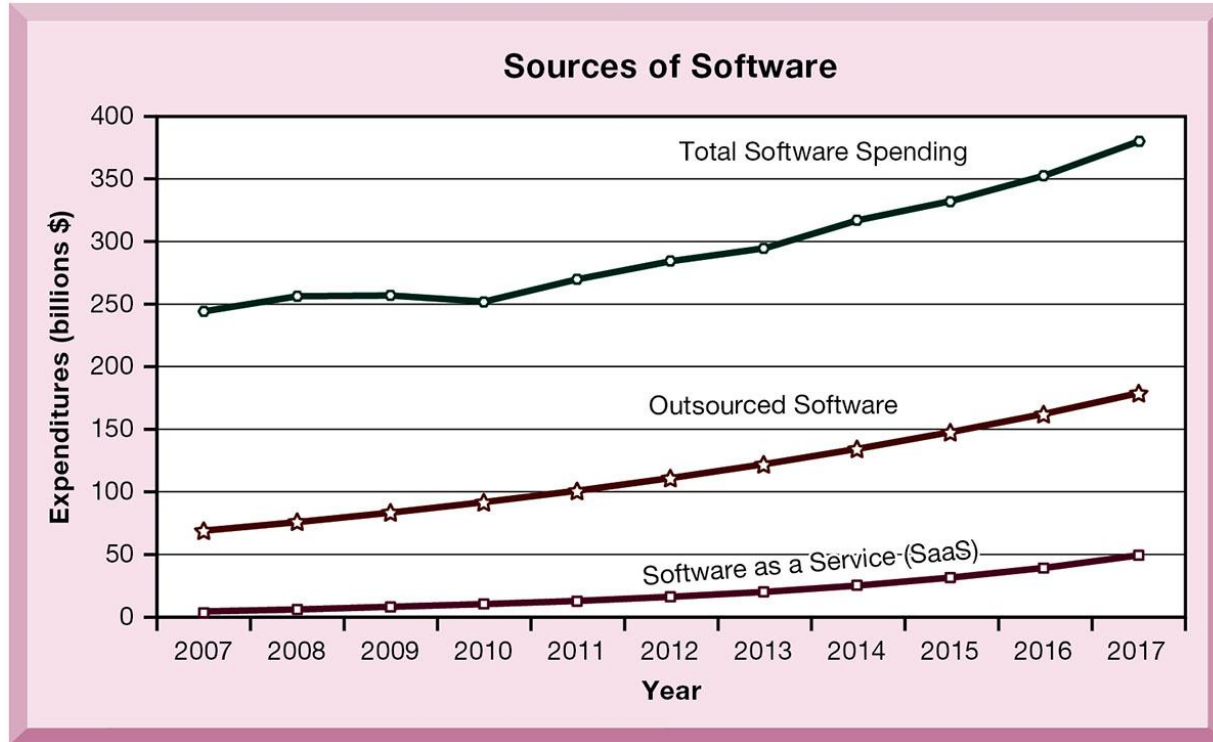
Figure 5.11 How Dollar Rent A Car Uses Web Services



What Are the Current Computer Software Platforms and Trends? (3 of 3)

- Software outsourcing and cloud services
 - Software packages and enterprise software
 - Software outsourcing
 - Cloud-based software services and tools
 - Service Level Agreements (SLAs): formal agreement with service providers
- Mashups and apps

Figure 5.12 Changing Sources of Firm Software



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