



# INFORMATION TECHNOLOGY FOR MANAGEMENT:

TRANSFORMING ORGANIZATIONS  
IN THE DIGITAL ECONOMY

EFRAIM TURBAN

DOROTHY LEIDNER

EPHRAIM MCLEAN

JAMES WETHERBE

5TH EDITION

Wiley Asia Student Edition



# Contents

## PART I

### IT In The Organization

#### **1 Information Technology: Strategic Application in a Digital Economy and Business Environment 1**

*Siemens AG 2*

##### **1.1 Doing Business in the Digital Economy 3**

##### **1.2 Business Pressures, Organizational Responses, and IT Support 12**

##### **1.3 Information Systems: Definitions and Examples 20**

##### **1.4 Information Technology Developments and Trends 26**

##### **1.5 Why Should You Learn About Information Technology? 34**

##### **1.6 Plan of the Book 35**

*Minicases: (1) Dartmouth College /*

*(2) Wal-Mart 40*

#### **Appendix 1A Porter's Models 44**

#### **2 Understanding and Managing Information Technologies 48**

*Building an E-Business at FedEx Corporation 48*

##### **2.1 Information Systems: Concepts and Definitions 51**

##### **2.2 Classification and Evolution of Information Systems 53**

##### **2.3 Transaction Processing versus Functional Information Systems 58**

##### **2.4 How IT Supports Organizational Activities 60**

##### **2.5 How IT Supports Supply Chain, CRM, PRM Operations 63**

##### **2.6 Information Systems Infrastructure and Architecture 66**

##### **2.7 Web-based Systems 71**

##### **2.8 New Computing Environments 74**

##### **2.9 Managing Information Resources 77**

*Minicases: (1) Maybelline / (2) J. P. Morgan 83*

#### **Appendix 2A Build-to-Order Production 87**

## PART II

### The Web Revolution

#### **3 Collaboration, Discovery, and Communication 89**

*Safeway Collaborates in Designing Stores 90*

##### **3.1 Network Computing—An Overview 91**

##### **3.2 Discovery 95**

##### **3.3 Communication 104**

##### **3.4 Collaboration 108**

##### **3.5 Collaboration-Enabling Tools: From Workflow to Groupware 116**

##### **3.6 E-Learning and Virtual Work 120**

##### **3.7 Some Ethical and Integration Issues 124**

*Minicases: (1) General Motors / (2) Cisco 131*

#### **4 E-Commerce and E-Business 137**

*Buy Chocolate Online? try godiva.com 138*

##### **4.1 Overview of E-Commerce and E-Business 139**

##### **4.2 Major EC Mechanisms 143**

##### **4.3 Business-to-Consumer Applications 146**

##### **4.4 Online Advertising 153**

##### **4.5 B2B Applications 157**

##### **4.6 Intrabusiness and Business-to-Employees EC 161**

##### **4.7 E-Government and Consumer-to-Consumer EC 161**

##### **4.8 E-Commerce Support Services 164**

##### **4.9 Ethical and Legal Issues in E-Business 170**

##### **4.10 Failures and Strategies for Success 174**

*Minicases: (1) FreeMarkets.com / (2) Hi-Life Corporation 181*

#### **5 Comparing Wireless, Pervasive, and Mobile Computing 185**

*Nextbus 186*

##### **5.1 Mobile Computing and Commerce: Overview, Benefits, and Drivers 187**

##### **5.2 Mobile Computing Infrastructure 193**

##### **5.3 Mobile Applications in Financial Services 202**

##### **5.4 Mobile Shopping, Advertising, and Content-Providing 204**

- 5.5** Mobile Intrabusiness and Enterprise Applications **208**
- 5.6** Mobile B2B and Supply Chain Applications **214**
- 5.7** Mobile Consumer and Personal Service Applications **214**
- 5.8** Location-Based Commerce **218**
- 5.9** Pervasive Computing **222**
- 5.10** Inhibitors and Barriers of Mobile Computing **232**  
*Minicases: (1) Hertz / (2) Washington Township (OH)* **239**

### **PART III Organizational Applications**

#### **6 Functional Information Systems, Transaction Processing, and Integration 244**

*Dartmouth-Hitchcock Medical Center* **245**

- 6.1** Functional Information Systems **247**
- 6.2** Transaction Processing Information Systems **249**
- 6.3** Managing Production/Operations and Logistics **255**
- 6.4** Managing Marketing and Sales Systems **260**
- 6.5** Managing the Accounting and Finance Systems **269**
- 6.6** Managing Human Resources Systems **276**
- 6.7** Integrating Functional Information Systems **282**  
*Minicases: (1) Dollar General / (2) 99 Cents Only Stores* **289**

#### **7 Supply Chains, ERP, and CRM: Understanding Enterprise Systems 293**

*ChevronTexaco* **294**

- 7.1** Essentials of Enterprise Systems and Supply Chains **295**
- 7.2** Supply Chain Problems and Solutions **299**
- 7.3** Computerized Enterprise Systems: MRP, MRP II, SCM and Software Integration **309**
- 7.4** Enterprise Resource Planning and Supply Chain Management **311**
- 7.5** CRM and Its support by IT **318**  
*Minicases: (1) Northern Digital / (2) QVC* **327**

#### **8 Information Systems: Global and Interorganizational Perspectives 331**

*Dell* **332**

- 8.1** Interorganizational Systems **334**
- 8.2** Global Information Systems **336**

- 8.3** B2B Exchanges, Hubs, and Directories **341**
- 8.4** Virtual Corporations and IT Support **344**
- 8.5** Electronic Data Interchange (EDI) **345**
- 8.6** Extranets, XML, and Web Services **349**
- 8.7** IOS Implementation Issues **354**  
*Minicases: (1) Volkswagen / (2) Six Flags* **361**

### **PART IV Managerial and Decision Support Systems**

#### **9 Managing Knowledge 365**

*KM Portal at Frito-Lay Assists Dispersed Sales*

*Teams* **366**

- 9.1** Introduction to Knowledge Management **367**
- 9.2** Knowledge Management Initiatives **372**
- 9.3** Approaches to Knowledge Management **374**
- 9.4** Information Technology in Knowledge Management **376**
- 9.5** Knowledge Management Systems Implementation **380**
- 9.6** Roles of People in Knowledge Management **388**
- 9.7** Ensuring Success of KM Efforts **391**  
*Minicases: (1) DaimlerChrysler / (2) Buckman Labs* **400**

#### **10 Data Warehousing, Analyzing, Mining, and Visualization 406**

*Harrah's Entertainment* **407**

- 10.1** Data Management: A Critical Success Factor **409**
- 10.2** Data Warehousing **417**
- 10.3** Information and Knowledge Discovery with Business Intelligence **422**
- 10.4** Data Mining Concepts and Applications **428**
- 10.5** Data Visualization Technologies **432**
- 10.6** Marketing Databases in Action **440**
- 10.7** Web-Based Data Management Systems **443**  
*Minicases: (1) Homeland Security / (2) Sears* **451**

#### **11 Intelligent Systems: Management Support for Decision Making 456**

*New Balance* **457**

- 11.1** Managers and Decision Making **459**
- 11.2** Decision Support Systems **465**
- 11.3** Group Decision Support Systems **471**

- 11.4** Enterprise and Executive Decision Support Systems **471**
- 11.5** Intelligent Support Systems: The Basics **476**
- 11.6** Expert Systems **480**
- 11.7** Other Intelligent Systems **484**
- 11.8** Web-Based Management Support Systems **492**
- 11.9** Advanced and Special Decision Support Topics **492**
  - Minicases: (1) Netherlands Railway / (2) Singapore and Malaysia Airlines* **500**

**PART V**

**Implementing and Managing IT**

**12 Establishing Strategic Advantage through Information Technology** **505**

- Dell's Direct Path to Success* **506**
- 12.1** Strategic Advantage and Information Technology **508**
- 12.2** Porter's Value Chain Model **513**
- 12.3** Strategic Resources and Capabilities **515**
- 12.4** IT Planning—A Critical Issue for Organizations **519**
- 12.5** Strategic IT Planning (Stage 1) **521**
- 12.6** Information Requirements Analysis, Resource Allocation, and Project Planning (Stages 2–4) **528**
- 12.7** Planning IT Architectures **531**
- 12.8** Some Issues in IT Planning **536**
  - Minicase (1) Cisco Systems / (2) National City Bank* **547**

**13 Economics of IT** **552**

- State of Iowa* **553**
- 13.1** Financial and Economic Trends and the Productivity Paradox **554**
- 13.2** Evaluating IT Investment: Benefits, Costs, and Issues **560**
- 13.3** Methods for Evaluating and Justifying IT Investment **566**
- 13.4** IT Economics Strategies: Chargeback and Outsourcing **574**
- 13.5** Economics of Web-Based Systems and E-Commerce **580**
- 13.6** Other Economic Aspects of Information Technology **582**
  - Minicases: (1) Intranets / (2) Kone Inc.* **589**

**14 IT Acquisition and Implementation** **594**

- How Sterngold Acquired an e-Commerce System* **595**
- 14.1** The Landscape and Framework of IT Application Acquisition **597**
- 14.2** Identifying, Justifying, and Planning Information System Applications (Step 1) **600**
- 14.3** Acquiring IT Applications: Available Options (Step 3) **602**
- 14.4** Outsourcing and Application Service Providers **608**
- 14.5** Vendor and Software Selection and Other Implementation Issues **611**
- 14.6** Connecting to Databases and Business Partners: Integration (Step 4) **614**
- 14.7** Business Process Redesign **615**
- 14.8** The Role of IT in Business Process Redesign **617**
- 14.9** Restructuring Processes and Organizations **621**
  - Minicase (1) Pioneer Inc. / (2) McDonald's* **628**

**15 Information Resource Management and Security Issues** **632**

- Cybercrime in the New Millennium* **633**
- 15.1** The IS Department and End Users **634**
- 15.2** The CIO in Managing the IS Department **639**
- 15.3** IS Vulnerability and Computer Crimes **641**
- 15.4** Protecting Information Resources: From National to Organizational Efforts **652**
- 15.5** Securing the Web, Intranets, and Wireless Networks **660**
- 15.6** Business Continuity and Disaster Recovery Planning **667**
- 15.7** Implementing Security: Auditing and Risk Management **670**
- 15.8** Information Technology in Counterterrorism **676**
  - Minicases: (1) Home Depot / (2) Zions Bancorporation* **683**

**16 Information Technology: Its Organizational and Societal Impact** **688**

- Movie Piracy* **689**
- 16.1** Introduction **691**
- 16.2** IT Is Eliminating the Barriers of Time, Space, and Distance **692**
- 16.3** Information Is Changing from a Scarce Resource to an Abundant Resource **696**

**16.4** Machines Are Performing Functions Previously Performed by Humans **703**

**16.5** Information Technology Urges People to Reexamine Their Value Systems **711**

**16.6** Conclusion **716**

*Minicases: (1) ChoicePoint: / (2) Australian Fishing Community* **720**

## **Technology Guides (Online)**

### **T1 Hardware**

**T1.1** What Is a Computer System?

**T1.2** The Evolution of Computer Hardware

**T1.3** Types of Computers

**T1.4** The Microprocessor and Primary Storage

**T1.5** Input/Output Devices

### **T2 Software**

**T2.1** Types of Software

**T2.2** Application Software

**T2.3** Systems Software

**T2.4** Programming Languages

**T2.5** Software Development and CASE Tools

**T2.6** Software Issues and Trends

### **T3 Data and Databases**

**T3.1** File Management

**T3.2** Databases and Database Management Systems

**T3.3** Logical Data Organization

**T3.4** Creating Databases

**T3.5** Emerging Database Models

**T3.6** Data Warehouses

**T3.7** Physical Database Organization

**T3.8** Database Management

**T3.9** An Emerging Technology: IP-based Storage

### **T4 Telecommunications**

**T4.1** Telecommunications Concepts

**T4.2** Communications Media (Channels)

**T4.3** Network Systems: Protocols, Standards, Interfaces, and Topologies

**T4.4** Network Architecture: Open Systems and Enterprise Networking

**T4.5** Telecommunications Applications

### **T5 The Internet and the Web**

**T5.1** What Is the Internet?

**T5.2** Basic Characteristics and Capabilities of the Internet

**T5.3** Browsing and the World Wide Web

### **T6 A Technical View of Systems Analysis and Design**

**T6.1** Developing an IT Architecture

**T6.2** Overview of the SDLC

**T6.3** Alternative Methods and Tools for Systems Development

**T6.4** Component-Based Development and Web Services

**Glossary 725**

**Photo Credits 737**

**Name Index 739**

**Subject Index 747**