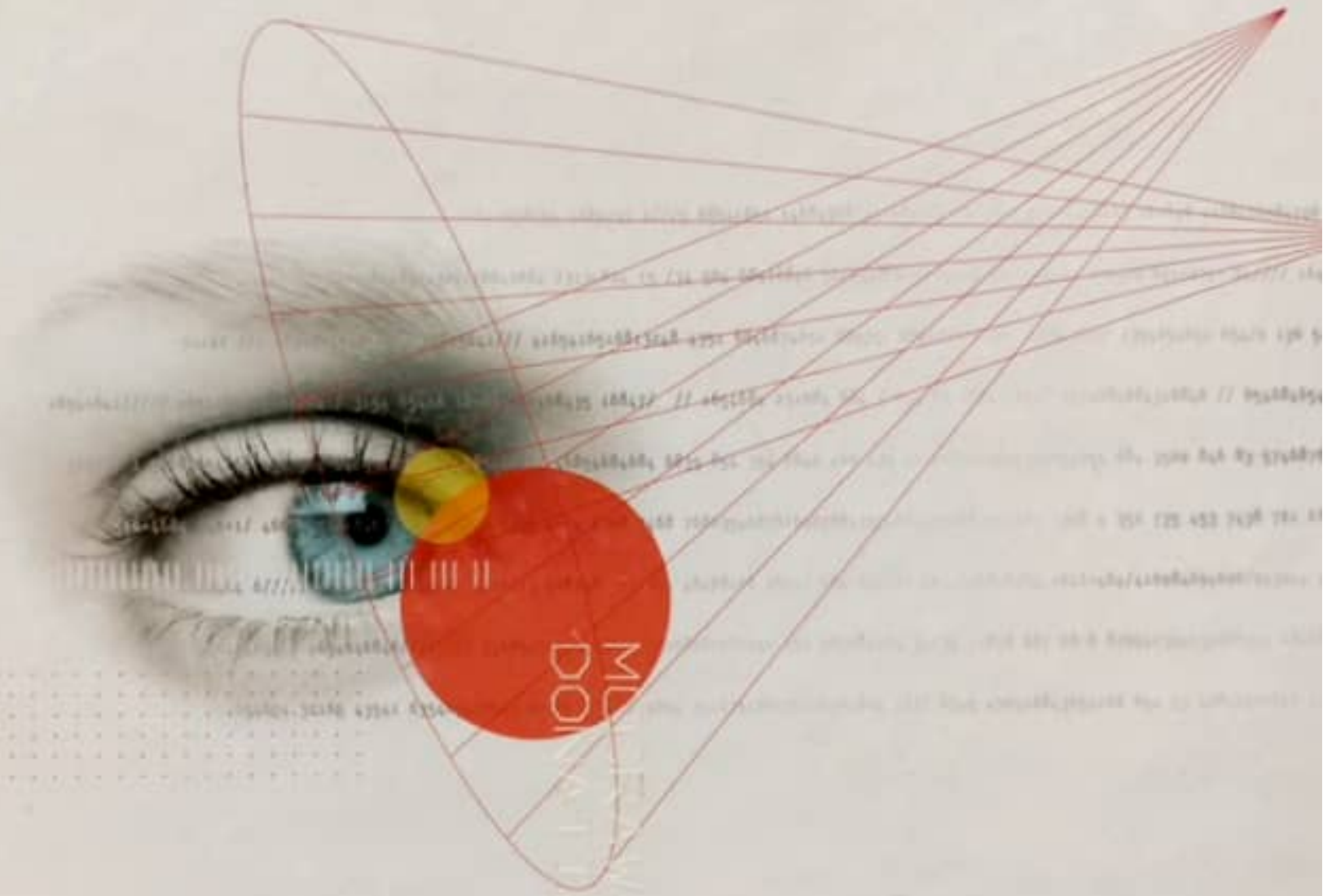

# > Management Information Systems

for the Information Age >>

_Stephen Haag / Maeve Cummings / Amy Phillips ///

/// / Sixth Edition // // /

สแกนด้วย CamScanner

# BRIEF CONTENTS


CHAPTER ONE 2
The Information Age in Which You Live: Changing the Face of Business

CHAPTER TWO 70
Major Business Initiatives: Gaining Competitive Advantage with IT

CHAPTER THREE 122
Databases and Data Warehouses: Building Business Intelligence

CHAPTER FOUR 178
Decision Support and Artificial Intelligence: Brainpower for Your Business

CHAPTER FIVE 238
Electronic Commerce: Strategies for the New Economy

CHAPTER SIX 278
Systems Development: Phases, Tools, and Techniques

CHAPTER SEVEN 316
Enterprise Infrastructure and Integration: Building the Dynamic Enterprise

CHAPTER EIGHT 354
Protecting People and Information: Threats and Safeguards

CHAPTER NINE 432
Emerging Trends and Technologies: Business, People, and Technology Tomorrow

EXTENDED LEARNING MODULE A 38
Computer Hardware and Software

EXTENDED LEARNING MODULE B 102
The World Wide Web and the Internet

EXTENDED LEARNING MODULE C 160
Designing Databases and Entity-Relationship Diagramming

EXTENDED LEARNING MODULE D 218
Decision Analysis with Spreadsheet Software

EXTENDED LEARNING MODULE E 276
Network Basics

EXTENDED LEARNING MODULE F 314
Building a Web Page with HTML

EXTENDED LEARNING MODULE G 352
Object-Oriented Technologies

EXTENDED LEARNING MODULE H 390
Computer Crime and Forensics

EXTENDED LEARNING MODULE I 454
Building an E-Portfolio

EXTENDED LEARNING MODULE J 494
Implementing a Database with Microsoft Access




สแกนด้วย CamScanner

EXTENDED LEARNING MODULE K 496
**Careers in Business**

EXTENDED LEARNING MODULE L 498
**Building Web Sites with FrontPage**

EXTENDED LEARNING MODULE M 500
**Programming in Excel with VBA**

Group Projects 502

สแกนด้วย CamScanner

*Preface* xvi

CHAPTER ONE 2

**The Information Age in Which You Live: Changing the Face of Business**

OPENING CASE STUDY: DISRUPTIVE TECHNOLOGIES DISRUPT BLOCKBUSTER LATE FEES 3

INTRODUCTION 4

INFORMATION AS A KEY RESOURCE 6

*Data, Information, and Business Intelligence* 6
*Personal Dimensions of Information* 6
*Organizational Dimensions of Information* 8

PEOPLE AS THE KEY RESOURCE 10

*Information and Technology Literacy* 10
*Your Ethical Responsibilities* 13

INFORMATION TECHNOLOGY AS A KEY RESOURCE 14

*Key Technology Categories* 15
*Ubiquitous Computing: Decentralized Computing, Shared Information, Mobile Computing, and a Whole Lot More* 17

CREATING THE BUSINESS VISION FOR INFORMATION TECHNOLOGY 18

*Top Line versus Bottom Line* 18
*Databases in Support of Competitive Advantages* 20
*Supporting Decision Making for Competitive Advantage* 21
*Pursuing Major Business Initiatives for Competitive Advantage* 24
*Run, Grow, and Transform* 25

INFORMATION TECHNOLOGY IN YOUR LIFE 26

*Your Career* 26
*Ethics, Security, and Privacy* 27

Closing Case Study One: You and Your Information 30

Closing Case Study Two: Technology Metrics—Measuring Efficiency and Effectiveness 32

*Electronic Commerce:* Using the Internet as a Tool to Find a Job 36

EXTENDED LEARNING MODULE A 38

**Computer Hardware and Software**

INTRODUCTION 39

A QUICK TOUR OF TECHNOLOGY 40

CATEGORIES OF COMPUTERS BY SIZE 42

*Personal Digital Assistants (PDAs)* 42
*Tablet PCs* 42
*Notebook Computers* 43
*Desktop Computers* 43
*Minicomputers, Mainframe Computers, and Supercomputers* 44

SOFTWARE: YOUR INTELLECTUAL INTERFACE 45

*Application Software* 45
*System Software* 48

HARDWARE: YOUR PHYSICAL INTERFACE 51

*Common Input Devices* 52
*Common Output Devices* 54
*Common Storage Devices* 56
*CPU and RAM* 59
*Connecting the Hardware Outside to the Hardware Inside* 61

CHAPTER TWO 70

**Major Business Initiatives: Gaining Competitive Advantage with IT**

OPENING CASE STUDY: BUSINESS INTELLIGENCE IS KEY TO THE SUCCESS OF THE MIAMI DOLPHINS 71

INTRODUCTION 72

PORTER'S FIVE FORCES MODEL 72

*Buyer Power* 73
*Supplier Power* 73
*Threat of Substitute Products or Services* 74
*Threat of New Entrants* 75
*Rivalry among Existing Competitors* 75

THE VALUE CHAIN 76

*Identifying Processes That Add Value* 77
*Identifying Processes That Reduce Value* 77

SUPPLY CHAIN MANAGEMENT 78

*Strategic and Competitive Opportunities with SCM* 80
*IT Support for Supply Chain Management* 81



สแกนด้วย CamScanner

CUSTOMER RELATIONSHIP MANAGEMENT 81
*Strategic and Competitive Opportunities with CRM* 83
*IT Support for Customer Relationship Management* 84
BUSINESS INTELLIGENCE 85
*Strategic and Competitive Opportunities with BI* 86
*IT Support for Business Intelligence* 87
INTEGRATED COLLABORATION ENVIRONMENTS 88
*Strategic and Competitive Opportunities with ICEs* 90
*IT Support for Integrated Collaboration Environments* 90
BACK TO THE BEGINNING 92
**Closing Case Study One: If We Don't Have It, You Get It for Free** 95
**Closing Case Study Two: The Restaurant Business Eats Up Business Intelligence** 96

*Electronic Commerce:* Ordering Products and Services on the Internet 100

EXTENDED LEARNING MODULE B 102
**The World Wide Web and the Internet**
INTRODUCTION 103
WORLD WIDE WEB 104
*Web Sites, Addresses, and Pages* 104
*Understanding Addresses* 105
*Using Web Browser Software* 106
SEARCH ENGINES 108
*Using a Directory Search Engine* 108
*Using a True Search Engine* 110
INTERNET TECHNOLOGIES 111
*The Internet Backbone* 111
*Internet Servers* 112
*Communications Protocols* 113
CONNECTING TO THE INTERNET 114
*Communications Software* 115
*Telecommunications Hardware* 116

CHAPTER THREE 122
**Databases and Data Warehouses: Building Business Intelligence**
OPENING CASE STUDY: KRISPY KREME—SEVEN DOUGHNUTS FOR EVERY MAN, WOMAN, AND CHILD IN THE UNITED STATES EVERY YEAR 123
INTRODUCTION 124
THE RELATIONAL DATABASE MODEL 126
*Collections of Information Created with Logical Structures* 126
*With Logical Ties within the Information* 128
*With Built-In Integrity Constraints* 129
DATABASE MANAGEMENT SYSTEM TOOLS 130
*Data Definition Subsystem* 131
*Data Manipulation Subsystem* 132
*Application Generation Subsystem* 136
*Data Administration Subsystem* 136
DATA WAREHOUSES AND DATA MINING 140
*What Is a Data Warehouse?* 140
*What Are Data-Mining Tools?* 141
*Data Marts: Smaller Data Warehouses* 143
*Data Mining as a Career Opportunity* 144
*Important Considerations in Using a Data Warehouse* 145
INFORMATION OWNERSHIP 146
*Strategic Management Support* 146
*The Sharing of Information with Responsibility* 147
*Information Cleanliness* 148
**Closing Case Study One: Ben & Jerry's, Bigelow Teas, and Business Intelligence** 150
**Closing Case Study Two: Mining Dining Data** 152

*Electronic Commerce:* Searching Online Databases and Information Repositories 157

EXTENDED LEARNING MODULE C 160
**Designing Databases and Entity-Relationship Diagramming**
INTRODUCTION 161
DESIGNING AND BUILDING A RELATIONAL DATABASE 161
*Step 1: Defining Entity Classes and Primary Keys* 163
*Step 2: Defining Relationships among the Entity Classes* 164
*Step 3: Defining Information (Fields) for Each Relation* 172
*Step 4: Using a Data Definition Language to Create Your Database* 175

CHAPTER FOUR 178
**Decision Support and Artificial Intelligence: Brainpower for Your Business**
OPENING CASE STUDY: DECISION SUPPORT SYSTEM—THE RESIDENT SECOND OPINION 179

สแกนด้วย CamScanner

INTRODUCTION 180

DECISIONS, DECISIONS, DECISIONS 181

*How You Make a Decision* 181
*Types of Decisions You Face* 182

DECISION SUPPORT SYSTEMS 183

*Components of a Decision Support System* 184

GEOGRAPHIC INFORMATION SYSTEMS 187

ARTIFICIAL INTELLIGENCE 189

EXPERT SYSTEMS 190

*What Expert Systems Can and Can't Do* 192

NEURAL NETWORKS AND FUZZY LOGIC 193

*Inside a Neural Network* 195
*Fuzzy Logic* 197

GENETIC ALGORITHMS 197

INTELLIGENT AGENTS 200

*Information Agents* 200
*Monitoring-and-Surveillance Agents* 201
*Data-Mining Agents* 202
*User Agents* 203

MULTI-AGENT SYSTEMS AND AGENT-BASED MODELING 204

*Ant Colonies and Swarm Intelligence* 204

Closing Case Study One: Shuttle Debris, Trees, and Sniper Attacks 210

Closing Case Study Two: Using Neural Networks to Categorize People 211

*Electronic Commerce:* Finding Investment Opportunities on the Internet 216

EXTENDED LEARNING MODULE D 218

**Decision Analysis with Spreadsheet Software**

INTRODUCTION 219

LISTS 220

BASIC AUTOFILTER 222

CUSTOM AUTOFILTER 224

CONDITIONAL FORMATTING 226

PIVOT TABLES 228

BACK TO DECISION SUPPORT 235

*AutoFilter* 235
*Conditional Formatting* 235
*Pivot Table* 235

CHAPTER FIVE 238

**Electronic Commerce: Strategies for the New Economy**

OPENING CASE STUDY: IS AMERICA ONLINE (AOL) INCHING TOWARD BECOMING AN INTERNET BANK? 239

INTRODUCTION 240

E-COMMERCE BUSINESS MODELS 242

UNDERSTAND YOUR BUSINESS, PRODUCTS, SERVICES, AND CUSTOMERS 244

*Who Are Your Customers?* 244
*What Is the Value of Your Products and Services as Perceived by Your Customers?* 245

FIND CUSTOMERS AND ESTABLISH RELATIONSHIPS 250

*Business to Consumer* 250
*Business to Business* 252

MOVE MONEY EASILY AND SECURELY 254

*Business to Consumer Payment Systems* 254
*Business to Business Payment Systems* 256
*Security: The Pervading Concern* 258

THE BROADENING OF E-GOVERNMENT 261

*Government to Government (G2G, intra-G2G)* 262
*Government to Business* 262
*Government to Consumer* 263
*International Government to Government (inter-G2G)* 264
*Government Spending on Information Technology* 264

Closing Case Study One: When You're Big, You Can Be Your Own B2B E-Marketplace 267

Closing Case Study Two: Toting the E-Commerce Line with eBags 269

*Electronic Commerce:* Getting Your Business on the Internet 274

EXTENDED LEARNING MODULE E 276

**Network Basics (on CD)**

CHAPTER SIX 278

**Systems Development: Phases, Tools, and Techniques**

OPENING CASE STUDY: MERCEDES-BENZ ONLINE BUILT-TO-ORDER TRUCKS 279

INTRODUCTION 280

สแกนด้วย CamScanner

THE SYSTEMS DEVELOPMENT LIFE CYCLE 280
*Phase 1: Planning* 280
*Phase 2: Analysis* 282
*Phase 3: Design* 283
*Phase 4: Development* 284
*Phase 5: Testing* 285
*Phase 6: Implementation* 286
*Phase 7: Maintenance* 286

SYSTEMS DEVELOPMENT METHODOLOGIES 287
*Waterfall Methodology* 288
*Rapid Application Development Methodology* 288
*Extreme Programming Methodology* 289
*Agile Methodology* 290

OUTSOURCING 290
*Outsourcing Options* 293
*The Advantages and Disadvantages of Outsourcing* 295
*Business Process Outsourcing (BPO)* 297

PROTOTYPING 298
*The Prototyping Process* 300
*The Advantages of Prototyping* 301
*The Disadvantages of Prototyping* 301

END-USER DEVELOPMENT 302
*Which Applications for IT to Offload* 303
*The Right Tool for the Job* 303

Closing Case Study One: Getting Software Development Right 305

Closing Case Study Two: To Outsource or Not to Outsource 306

*Electronic Commerce:* Finding Freeware and Shareware on the Internet 311

EXTENDED LEARNING MODULE F 314
**Building a Web Page with HTML (on CD)**

CHAPTER SEVEN 316
**Enterprise Infrastructure and Integration: Building the Dynamic Enterprise**

OPENING CASE STUDY: ONE VIEW FOR DEL MONTE FOODS 317

INTRODUCTION 318

ENTERPRISE SYSTEMS 318
*What Are Enterprise Systems?* 318
*Enterprise Resource Planning (ERP) Systems* 320
*The Evolution of ERP Systems* 323
*ERP Vendors and Market Trends* 324

DEVELOPING AGILE IT SYSTEMS 326
*Availability* 326
*Accessibility* 326
*Reliability* 327
*Scalability* 327
*Flexibility* 327
*Performance* 327
*Capacity Planning* 328

INFORMATION SYSTEMS INFRASTRUCTURE 328
*Why Architecture Matters* 330
*Why Infrastructure Matters* 330

INFORMATION TECHNOLOGY INFRASTRUCTURE 332
*Decentralized Infrastructure* 332
*Centralized Infrastructure* 333
*Distributed Infrastructure* 334
*Client/Server Infrastructure* 334
*Other Types of Infrastructures* 335
*The Infrastructure Investment* 336
*Supporting an IT Infrastructure* 337
*Real World IT Infrastructures* 338

INTEGRATING THE ENTERPRISE 339
*Why Integration Is Necessary* 340
*Motives for Integration* 341
*Benefits of Integration* 342
*Integration Obstacles* 342

Closing Case Study One: Linux Supports an Infrastructure 344

Closing Case Study Two: Netflix—Transforming the Entertainment Industry 345

*Electronic Commerce:* Living Life on the Internet 349

EXTENDED LEARNING MODULE G 352
**Object-Oriented Technologies (on CD)**

CHAPTER EIGHT 354
**Protecting People and Information: Threats and Safeguards**

OPENING CASE STUDY: THEY KNOW ABOUT 96 PERCENT OF AMERICAN HOUSEHOLDS 355

INTRODUCTION 356

ETHICS 356
*Two Factors That Determine How You Decide Ethical Issues* 357
*Guidelines for Ethical Computer System Use* 358
*Intellectual Property* 359

สแกนด้วย CamScanner

PRIVACY 361
*Privacy and Other Individuals* 362
*Identity Theft* 362
*Privacy and Employees* 364
*Privacy and Consumers* 367
*Privacy and Government Agencies* 371
*Laws on Privacy* 373

SECURITY 374
*Security and Employees* 374
*Security and Outside Threats* 376
*Security Precautions* 378

**Closing Case Study One: Cautionary Tales of Indiscreet E-Mail** 383

**Closing Case Study Two: The Problem of Information Protection** 384

*Electronic Commerce:* Making Travel Arrangements on the Internet 388

EXTENDED LEARNING MODULE H 390
**Computer Crime and Forensics**

INTRODUCTION 391

COMPUTER CRIME 392
*Outside the Organization* 392
*Web Defacing* 399
*The Players* 400
*Inside the Organization* 403

COMPUTER FORENSICS 403
*The Collection Phase* 405
*The Analysis Phase* 408

RECOVERY AND INTERPRETATION 409
*Places to Look for Useful Information* 409
*Ways of Hiding Information* 412

WHO NEEDS COMPUTER FORENSIC INVESTIGATORS? 415
*Proactive Computer Forensic Education for Problem Prevention* 415
*Reactive Computer Forensics for Incident Response* 416
*A Day in the Life of a Computer Forensic Expert* 417

CHAPTER NINE 422
**Emerging Trends and Technologies: Business, People, and Technology Tomorrow**

OPENING CASE STUDY: THE FUTURE: TECHNOLOGY OUT, PRINGLES IN 423

INTRODUCTION 424

THE CHANGING INTERNET 425
*Software-as-a-Service* 425
*Push, Not Pull, Technologies and Personalization* 426
*Voice over Internet Protocol (VoIP)* 428

PHYSIOLOGICAL INTERACTION 428
*Automatic Speech Recognition* 429
*Virtual Reality* 429
*Cave Automatic Virtual Environments* 431
*Biometrics* 432

INCREASING PORTABILITY AND MOBILITY 435
*Digital Cash* 436
*Wearable Computers* 437
*Multi-State CPUs and Holographic Storage Devices* 438

THE WIRELESS ARENA 439
*The Next Generation of Cell Phone Technology* 439
*RFID (Radio Frequency Identification)* 440

MOST IMPORTANT CONSIDERATIONS 442
*The Necessity of Technology* 443
*Closing the Great Digital Divide* 443
*Technology for the Betterment of Society* 444
*Exchanging Privacy for Convenience* 444
*Ethics, Ethics, Ethics* 445

**Closing Case Study One: Wildseed—A Cell Phone for Every Fashion** 446

**Closing Case Study Two: T2C—Not Another New E-Commerce Business Model** 448

*Electronic Commerce:* Continuing Your Education Through the Internet 452

EXTENDED LEARNING MODULE I 454
**Building an E-Portfolio**

INTRODUCTION 455

THE ELECTRONIC JOB MARKET—EXTENDING YOUR REACH 455

CONVERGENCE OF ONLINE NETWORKING AND RÉSUMÉ DEVELOPMENT 457
*Start to Network* 457
*Perform a Self-Assessment* 459
*Research Careers, Industries, and Companies* 459

RÉSUMÉ BUILDING—A LIFELONG PROCESS 461
*Content, Content, Content* 462
*Electronic File Formats* 467
*What Is the Right Résumé Style?* 472

สแกนด้วย CamScanner

DEVELOPING YOUR JOB SEARCH E-PORTFOLIO 473
*Self-Promotion* 473
*Give Them What They Want* 474
*The Shape of an E-Portfolio* 475
*E-Gallery* 475

WEB DESIGN CONSIDERATIONS 476
*Basic Web Design Principles* 476
*Design Your Homepage* 481

PREPARING WEB CONTENT 484
*HTML versus Generated Code* 485
*Test, Test, Test* 488

EXTENDED LEARNING MODULE J 494
**Implementing a Database with Microsoft Access (on CD)**

EXTENDED LEARNING MODULE K 496
**Careers in Business (on CD)**

EXTENDED LEARNING MODULE L 498
**Building Web Sites with FrontPage (on CD)**

EXTENDED LEARNING MODULE M 500
**Programming in Excel with VBA (on CD)**

Glossary 526
Notes 540
Photo Credits 547
Index 548

สแกนด้วย CamScanner