

# Module I Foundation Concepts

Chapter 1

Chapter 1	Real World Case 2: Duke Energy: Introducing e-Business Throughout the Business Enterprise 19
Foundations of Information Systems in Business 3	Trends in Information Systems 20
	The e-Business Enterprise 22
Section I: Foundation Concepts: Information Systems and Technologies 4	Types of Information Systems 24 Operations Support Systems 24
Why Information Systems Are Important 4	Management Support Systems 26
The Real World of Information Systems 4	Other Classifications of Information Systems 26
Real World Case 1: General Electric Company: Implementing e-Business and e-Commerce Initiatives 5 Analyzing General Electric Company 6	Managerial Challenges of Information Technology 28 Success and Failure with IT 28 Developing e-Business Solutions 29 Ethics and IT 30
What You Need to Know 6  An IS Framework for Business Professionals 6  What Is an Information System? 7	Challenges of IT Careers 31 The IS Function 32
Information Technologies 7  System Concepts: A Foundation 8  What Is a System? 8  Feedback and Control 9  Other System Characteristics 9	Real World Case 3: Ford and UPS Logistics: The Business Value of Information Technology 37
	Real World Case 4: Hewlett-Packard and Staff-Leasing: Success and Failure with Customer Relationship Management 38
Components of an Information System 10	
Information System Resources 11	Chapter 2
People Resources 11	Competing with Information
Hardware Resources 12 Software Resources 12	Technology 39
Data Resources 13	<del>-</del> -
Network Resources 14	Section I: Fundamentals of Strategic
Information System Activities 14	Advantage 40 Strategic IT 40
Input of Data Resources 14	Analyzing Capital One 40
Processing of Data into Information 15 Output of Information Products 15	Real World Case 1: Capital One Financial
Information Quality 15	Corporation: Using Information Technology for
Storage of Data Resources 15	Competetive Advantage 41
Control of System Performance 15	Competitive Strategy Concepts 42
Recognizing Information Systems 16  Analyzing GE's Information Systems 16	Strategic Uses of Information Technology 43 Other Competitive Strategies 44
Section II: Foundations Concepts: Business	The Value Chain and Strategic IS 46
Applications, Development, and Management	8 Value Chain Examples 46
The Fundamental Roles of IS Applications in Business 18  Analyzing Duke Energy 18	Internet-Based Value Chains 47
The state of the s	Identifying e-Business and e-Commerce Strategies 48

# Section II: Using Information Technology for Strategic Advantage 50

Strategic Uses of IT 50

Analyzing Moen Inc. 50

**Real World Case 2:** Moen Inc.: Implementing e-Business and e-Commerce Strategies 51

Building a Customer-Focused e-Business 52

Reengineering Business Processes 54

The Role of Information Technology 55

Improving Business Quality 55

Total Quality Management 56

Becoming an Agile Company 57

Creating a Virtual Company 58

Virtual Company Strategies 59

Building a Knowledge-Creating Company 60

Knowledge Management Systems 60

**Real World Case 3:** GM, Fidelity Investments, and Staples: Expanding Strategic Web-Based Alliances 65

**Real World Case 4:** Dell Computer and Litton: Benefits and Challenges of B2B e-Commerce Strategies 66

## Module II Information Technologies

### Chapter 3

### Computer Hardware 69

# Section I: Computer Systems: End User and Enterprise Computing 70

Analyzing Boeing, Monster.com, and Others 70

Trends in Computer Systems 70

**Real World Case 1:** Boeing, Monster.com, and Others: Corporate Criteria for Buying PC Systems 71

Computer Generations 72

Microcomputer Systems 73 Network Computers 74

> Information Appliances 76 Computer Terminals 76

Midrange Computer Systems 77

Mainframe Computer Systems 78 Supercomputer Systems 79

Technical Note: The Computer System Concept 80

Computer Processing Speeds 81

# Section II: Computer Peripherals: Input, Output, and Storage Technologies 82

Analyzing Dresdner Bank and Wyndham International 82

Peripherals 82

Real World Case 2: Dresdner Bank and Wyndham International: The Business Case for Server Consolidation 83

Input Technology Trends 84

Pointing Devices 85

Pen-Based Computing 86

Speech Recognition Systems 86

Optical Scanning 88

Other Input Technologies 89

Output Technologies and Trends 90

Video Output 90

Printed Output 91

Storage Trends and Trade-Offs 91

Computer Storage Fundamentals 93

Direct and Sequential Access 93

Semiconductor Memory 95

Magnetic Disk Storage 95
Types of Magnetic Disks 96
RAID Storage 96

Magnetic Tape Storage 97

Optical Disk Storage 97
Business Applications 97

Real World Case 3: AMS Services, Primestream, and The Jockey Club: The Business Case for Rack-Mounted Servers 102

Real World Case 4: Kmart and Staples: Benefits and Challenges of Web Kiosks in Retail Outlets 103

### Chapter 4

### Computer Software 105

# Section I: Application Software: End User Applications 106

Introduction to Software - 106

Analyzing Intuit, Inc. 106

Real World Case 1: Intuit, Inc.: Challenge and Innovation in Consumer and Small Business Software 107

Software Trends 108

Application Software for End Users 109

Software Suites and Integrated Packages 110

Web Browsers and More 111

Electronic Mail 111

Word Processing and Desktop Publishing 112

Electronic Spreadsheets 113

Database Management 114

Presentation Graphics and Multimedia 114

Multimedia Software Technologies 116

Personal Information Managers 117

Groupware 117

Other Business Software 119

Management 120	Data Warehouses and Data Mining 151  Data Mining 151
System Software Overview 120	Hypermedia Databases on the Web 153
Analyzing Air Products, Farmers Group, and Others 120 Overview 120	Implementing Data Resource Management 153 Challenges of Data Resource Management 154
Real World Case 2: Air Products, Farmers Group, and Others: Microsoft's Battle for the Enterprise Software Market 121	Section II: Technical Foundations of Database Management 156
Operating Systems 122 Operating System Functions 122 Popular Operating Systems 124 Network Management Programs 125 Database Management Systems 126	Database Management 156 Analyzing Aetna and Boeing 156  Real World Case 2: Aetna and Boeing Co.: Challenges of Data Resource Management 157  Database Structures 158  Hierarchical Structure 158
Other System Management Programs 127  Programming Languages 127  Machine Languages 127  Assembler Languages 128  High-Level Languages 128  Fourth-Generation Languages 129  Object-Oriented Languages 130  HTML, XML, and Java 130  Programming Software 132	Network Structure 159 Relational Structure 159 Multidimensional Structure 159 Object-Oriented Structure 159 Evaluation of Database Structures 160 Object Technology and the Web 161 Accessing Databases 163 Key Fields 163 Sequential Access 163
Language Translator Programs 132 Programming Tools 133  Real World Case 3: First Union, Martins and Demotses, and Others: Peer-to-Peer Applications for Large and Small Business 138	Direct Access 163  Database Development 164  Data Planning and Database Design 164  Real World Case 3: Trimac Corp. and Sallie Mae: Using
Real World Case 4: Fidelity Investments: Challenges and Benefits of Converting to XML 139	Data Warehouses for Business Intelligence 170  Real World Case 4: Merrill Lynch and Terra Lycos: The Business Case for Outsourcing Data Storage 171
Chapter 5  Data Resource Management 141	Chapter 6 Telecommunications and
Section I: Managing Data Resources 142	Networks 173
Data Resource Management 142  Analyzing Oracle, IBM, and Others 142  Real World Case 1: Oracle, IBM, and Others: The Battle	Section I: The Internetworked Enterprise 174 Internetworking the Enterprise 174
for the Enterprise Database and Applications Market 143 Foundation Data Concepts 144 Character 144	Analyzing Sears and UPS 174  Real World Case 1: Sears and UPS: Challenges and Benefits of Wireless e-Business and e-Commerce 175
Field 145 Record 145 File 145 Database 145	Trends in Telecommunications 176 Industry Trends 176 Technology Trends 177
	Business Application Trends 178
The Database Management Approach 146	Business Application Trends 178  The Business Value of Telecommunications Networks 178
The Database Management Approach 146 Using Database Management Software 147 Database Development 147	
Using Database Management Software 147  Database Development 147  Database Interrogation 148	The Business Value of Telecommunications Networks 178 The Internet Revolution 179
Using Database Management Software 147  Database Development 147  Database Interrogation 148  Database Maintenance 149	The Business Value of Telecommunications Networks 178 The Internet Revolution 179 Internet Applications 179
Using Database Management Software 147  Database Development 147  Database Interrogation 148	The Business Value of Telecommunications Networks 178 The Internet Revolution 179 Internet Applications 179 Business Use of the Internet 180

### Section II: Telecommunications Network Alternatives 186

Telecommunications Alternatives 186 Analyzing Welch Packaging and Gorman Uniform Service 186

Real World Case 2: Welch Packaging and Gorman Uniform Service: Evaluating Broadband Internet Access Alternatives 187

A Telecommunications Network Model 188

Types of Telecommunications Networks 189

Wide Area Networks 189 Local Area Networks 189 Virtual Private Networks 191 Client/Server Networks 192 Network Computing 192 Peer-to-Peer Networks 192

Telecommunications Media 194 Twisted-Pair Wire 194 Coaxial Cable 195 Fiber Optics 195

Wireless Technologies 195 Terrestrial Microwave 195 Communications Satellites 195 Cellular and PCS Systems 196 Wireless LANs 196 The Wireless Web 197

Telecommunications Processors 198 Modems 198 Multiplexers 199 Internetwork Processors 199

Telecommunications Software 200 Network Management 200

Network Topologies 201

Network Architectures and Protocols 202 The OSI Model 202

The Internet's TCP/IP 202

Bandwidth Alternatives 202 Switching Alternatives 203

Real World Case 3: Bob Evans Farms: The Business Case for Communications Satellite Networks 210

Real World Case 4: Beema, Inc. and Ignition State: Evaluating Internet Telephony for Small Business 211

## Module III Business Applications

#### Electronic Business Systems 213

### Section I: Cross-Functional e-Business Systems 214

e-Business Applications 214 Analyzing Netro Corp. and Lightwave Microsystems 214

Real World Case 1: Netro Corp. and Lightwave Microsystems; The Business Value of Web-Based Manufacturing Systems 215 e-Business Application Architecture 216

Cross-Functional Enterprise Systems 217

Enterprise Resource Planning 217

Customer Relationship Management 219

Enterprise Application Integration 221

Supply Chain Management 222

Online Transaction Processing 224 The Transaction Processing Cycle 225

Enterprise Collaboration 226 Tools for Enterprise Collaboration 227

Section II: Functional e-Business Systems 230

Functional Business Systems 230 Analyzing Charles Schwab and Others 230

Real World Case 2: Charles Schwab and Others: The Business Value of Web-Based Human Resource Systems 231

IS in Business 232

Marketing Systems 232 Interactive Marketing 233

Targeted Marketing 233 Sales Force Automation 234

Manufacturing Systems 234

Computer-Integrated Manufacturing 235

Process Control 237 Machine Control 238 Robotics 238

Human Resource Systems 238

HRM and the Internet 238 HRM and Corporate Intranets 239

Staffing the Organization 239

Training and Development 240

Accounting Systems 240

Online Accounting Systems 242

Order Processing 242

Inventory Control 242 Accounts Receivable 242

Accounts Payable 243

Payroll 243

General Ledger 243

Financial Management Systems 243

Cash Management 243

Online Investment Management 244

Capital Budgeting 244

Financial Forecasting and Planning 244

Real World Case 3: Harrah's, Dupont, and Otis: Capital-	Chapier 9
izing on e-Business Initiatives in Challenging Times 250  Real World Case 4: Cardinal Glass, Hunt Corp.,	Decision Support Systems 291
and K&G: The Business Case for Supply Chain Event Management 251	Section I: Decision Support in e-Business 292
	e-Business and Decision Support 292  Analyzing International Rectifier, Blair, and Pillsbury 292
Chapter 8	Real World Case 1: International Rectifier, Blair, and
Electronic Commerce Systems 253	Pillsbury: Business Analytics for Decision Support 293 e-Business Decision Support Trends 294
Section I: Electronic Commerce Fundamentals 254	Information, Decisions, and Management 295 Decision Structure 296
Introduction to e-Commerce 254	Management Information Systems 297
Real World Case 1: Orvis, Supergo, and ComfortLiving: Improving e-Commerce Web Store Performance 255	Management Reporting Alternatives 297 Online Analytical Processing 298
Analyzing Orvis, Supergo, and ComfortLiving 256 The Scope of e-Commerce 256 Electronic Commerce Technologies 258	Decision Support Systems 300  DSS Models and Software 301  Geographic Information and Data Visualization
Essential e-Commerce Processes 258  Access Control and Security 259 Profiling and Personalizing 259 Search Management 260 Content and Catalog Management 260 Workflow Management 262 Event Notification 263 Collaboration and Trading 263	Systems 302 Using Decision Support Systems 303 What-If Analysis 303 Sensitivity Analysis 304 Goal-Seeking Analysis 305 Optimization Analysis 305 Data Mining for Decision Support 306 Executive Information Systems 307
Electronic Payment Processes 264  Web Payment Processes 264  Electronic Funds Transfer 264	Enterprise Portals and Decision Support 308  Enterprise Information Portals 308  Enterprise Knowledge Portals 311
Micropayment Systems 265 Secure Electronic Payments 265	Section II: Artificial Intelligence Technologies in Business 313
Section II: e-Commerce Applications	Analyzing Grove Madsen and Cutler-Hammer 313
and Issues 267 e-Commerce Application Trends 267	Real World Case 2: Grove Madsen and Cutler-Hammer: Using an Expert System for e-Manufacturing 314
Analyzing the Boeing Company 267  Real World Case 2: The Boeing Company: Implementing	An Overview of Artificial Intelligence 315  The Domains of Artificial Intelligence 315
Internal and External B2B Marketplaces 268 e-Commerce Trends 269	Neural Networks 317
Business-to-Consumer e-Commerce 270  e-Commerce Success Factors 270	Fuzzy Logic Systems 319 Fuzzy Logic in Business 319
Web Store Requirements 272	Genetic Algorithms 320
Developing a Web Store 273  Serving Your Customers 274	Virtual Reality 321  VR Applications 321
Managing a Web Store 275	Intelligent Agents 323
Business-to-Business e-Commerce 276	Expert Systems 325
e-Commerce Marketplaces 276  Electronic Data Interchange 279	Components of an Expert System 325 Expert System Applications 326
Clicks and Bricks in e-Commerce 280 e-Commerce Integration 281	Developing Expert Systems 327  Knowledge Engineering 328
Other Clicks and Bricks Strategies 282	The Value of Expert Systems 330  Benefits of Expert Systems 330

Real World Case 3: Ames Department Stores and IBM: The Business Case for Enterprise Information Portals 337 Real World Case 4: Eli Lilly and Anadarko Petroleum: Data Visualization Systems for Decision Support 338

Limitations of Expert Systems 331

Real World Case 3: Citigroup and Deere & Co.: Moving

Real World Case 4: Covisint, Johnson Controls, and Dana

Corp.: Challenges of B2B e-Commerce Marketplaces 289

from Failure to Success in e-Commerce 288

## Module IV Development Processes

### Chapter 10

# Developing e-Business Solutions 341

### Section I: Developing e-Business Systems 342

IS Development 342
Analyzing AvantGo, Sparklist, BuyerZone,
and OfficeMax 342

Real World Case 1: AvantGo, Sparklist, BuyerZone, and OfficeMax: Failures in B2B Website Design 343

The Systems Approach 344

Systems Thinking 344

The Systems Development Cycle 345

Prototyping 345

The Prototyping Process 346

Starting the Systems Development Process 347

Feasibility Studies 347

Systems Analysis 349
Organizational Analysis 350
Analysis of the Present System 350
Functional Requirements Analysis 351

Systems Design 351
User Interface Design 352

System Specifications 353

End User Development 353 Focus on IS Activities 354

Doing End User Development 355

# Section II: Implementing e-Business Systems 357

Implementation 357

Analyzing Amazon, Verizon, and Boise Cascade 357

**Real World Case 2:** Amazon, Verizon, and Boise Cascade: Implementing Customer-Centric e-Business Systems 358

Implementing New Systems 359

Evaluating Hardware, Software, and Services 359

Hardware Evaluation Factors 361

Software Evaluation Factors 362 Evaluating IS Services 362

Other Implementation Activities 364

Testing 364
Documentation 364
Training 364
Conversion Methods 365
IS Maintenance 366

Managing Organizational Change 367 Change Management 367

**Real World Case 3:** Frito-Lay Inc.: Failure and Success in Knowledge Portal Development 376

**Real World Case 4:** Ryder System and Others: Strategies for Successful User Involvement in Systems Development 377

### Module V Management Challenges

### Chapter 11

# Security and Ethical Challenges of e-Business 379

# Section I: Security, Ethical, and Societal Challenges of e-Business 380

Introduction 380

Analyzing Exodus Communications 380

**Real World Case 1:** Exodus Communications Inc.: Protecting Companies against Cybercrime 381

e-Business Security, Ethics, and Society 382

Computer Crime in e-Business 382

Hacking 383 Cyber Theft 384 Unauthorized Use at Work 385 Software Piracy 386

Piracy of Intellectual Property 387

Computer Viruses 388

Privacy Issues 389
Privacy on the Internet 390

Computer Matching 391 Privacy Laws 391

Computer Libel and Censorship 391

Other Challenges 391

Employment Challenges 391 Computer Monitoring 392

Challenges in Working Conditions 393

Challenges to Individuality 393

Health Issues 394
Ergonomics 394

Societal Solutions 395

You and Ethical Responsibility 395

Ethical Foundations 395 Business Ethics 396

Ethical Guidelines 397

## Section II: Security Management of e-Business 399

e-Business Security 399

Analyzing Visa International Inc. 399

Real World Case 2: Visa International Inc.: Implementing Strategies for Global Security Management 400	e-Business Technology Management 426 e-Business Planning 426
Security Management 401	Information Technology Architecture 428
Internetworked e-Business Defenses 402  Encryption 402  Fire Walls 403  Denial of Service Defenses 404  e-Mail Monitoring 404  Virus Defenses 405  Other Security Measures 406	Managing the IS Function 428  Organizing IT 429  Managing Application Development 430  Managing IS Operations 430  Human Resource Management of IT 431  The CIO and Other IT Executives 431  Technology Management 432
Security Codes 406	Managing User Services 433
Backup Files 406 Security Monitors 407	Section II: Global e-Business Technology Management 434
Biometric Security 407 Computer Failure Controls 407	The International Dimension 434  Analyzing DHL and ApplianceWare 434
Fault Tolerant Systems 408 Disaster Recovery 409	Real World Case 2: DHL Worldwide Express and ApplianceWare: Challenges of Global Systems
e-Business System Controls and Audits 409	Development 435
Information System Controls 409 Auditing e-Business Systems 410  Real World Case 3: AGM Container Controls and Sonalysts Inc.: The Business Case for Workplace Monitoring 415	Global e-Business Technology Management 436
	Cultural, Political, and Geoeconomic Challenges 436
	Global e-Business Strategies 437
	Global e-Business Applications 438
<b>Real World Case 4:</b> DoubleClick, Microsoft, and Others: Evaluating Privacy Challenges and Solutions 416	Global IT Platforms 440  The Internet as a Global IT Platform 440
Consultar 22	Global Data Access Issues 441 Internet Access Issues 443
Chapter 12 Enterprise and Global	Global Systems Development 444 Systems Development Strategies 445
Management of e-Business	Real World Case 3: Nike and Connecticut General:
Technology 417	Failures in e-Business System Implementation 451
Section I: Managing e-Business Technologies 418	Real World Case 4: IBM and the Timken Company: Evaluating Global e-Business Management Strategies 452
e-Business and IT 418 Analyzing Mellon Financial Corp. 418	Review Quiz Answers RQ-1
Real World Case 1: Mellon Financial Corp.: The Business Case for Hybrid e-Commerce Strategies 419	Selected References R-1
Managers and e-Business Technologies 420 Poor IS Performance 421	Glossary G-1

Management Involvement and Governance 423

The e-Business Organization 423

Indexes I-1