

Managing Information Technology

Fourth Edition

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FOURTH EDITION

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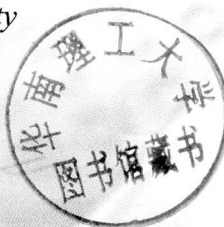
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PREFACE

The fourth edition of this widely used M.B.A. and advanced undergraduate textbook continues the tradition of the earlier editions by focusing on how to effectively manage information technology (IT) within organizational settings. To help illustrate issues unique to IT management, more than two dozen original case studies that span a wide range of topics are included at the end of each major section. These include camouflaged but real situations, as well as identified case studies of major multinational firms (including Compaq, Cummins Engine, IBM, and Owens Corning).

The overall structure of the book has been retained: Following an introductory chapter on IT as an enabler and chapters on three technology topics (hardware, software, and networking), we present numerous examples of three major types of IT applications (organizational systems, managerial support systems, and e-commerce applications); methodologies and techniques for developing, purchasing, and implementing systems and user support; and alternative approaches to planning and managing IT resources and the information system (IS) organization itself. Every chapter has been extensively revised for this new edition; the chapter on e-commerce applications has been totally rewritten to reflect the use of the Internet for conducting business with other businesses (B2B) and end consumers (B2C). The separate chapter on social and ethical issues in the third edition has been replaced by the inclusion of these topics in relevant chapters, and a new chapter on IT project management has been added at the end of Part III.

The new case studies in this edition deal with the decision to acquire an ERP system or not, a “big bang” ERP system implementation, the deployment of a large interorganizational system for a manufacturer and its distributors, business process reengineering in a major government facility, merger and acquisition challenges for IT organizations, and the provision of support for a new plant in Mexico.

PURPOSE

Our objective for this edition of the textbook is to prepare advanced management students—both undergraduate and graduate—to be effective managers within organizations that are expected to grow increasingly dependent on information technologies. A new digital economy has arrived, and the rules of business survival have radically changed. Being a user of IT is also clearly different today than in a pre-browser world. By learning alternative approaches to managing IT—both the opportunities and the pitfalls—you will be in a better position to leverage IT resources to meet both personal and organizational goals.

The first edition of this book appeared in 1991 to fill a major gap in terms of a textbook dealing with the *management* of IT, a course newly required in many M.B.A. programs and at the original authors’ home institution (Indiana University). Today most leading M.B.A. programs include IT management as a core course, and many undergraduate programs require a course with similar content. Earlier editions of this book have been used successfully in advanced undergraduate courses, M.B.A. programs, executive M.B.A. programs, and executive education courses throughout the world.

This fourth edition builds upon the authors’ experiences, along with the experiences of many others, in classroom teaching at both the undergraduate and M.B.A. levels, as well as on

our extensive IT experiences in researching and consulting in the field. It also incorporates new technology advances and research findings in the rapidly changing IS field. To illustrate the rapidity of change, note that the copyright date of the third edition was 1999, a time when IS professionals were in the final year of work to avoid year 2000 (Y2K) computing problems and dot-com ventures were growing at an unprecedented rate.

Our content also continues to reflect a documented trend in organizations today: Business managers, as well as information systems professionals, are increasingly being relied upon to play critical IT leadership roles. Today's business manager needs to be aware of the current (and future) IT capabilities that can be leveraged to strategic and operational advantage, as well as the limitations and potential problems involved in the use of IT. A manager needs to understand the range of applications for enterprise systems, managerial support systems, and e-commerce applications and both the processes for acquiring new information systems and the roles associated with effective systems implementation. A manager also must be aware of the many alternatives available for custom-developing or purchasing a system and the importance of prototyping, documentation, system testing, and rollout planning and execution, as well as the need for attention to security controls to preserve the integrity of a system. Managers need to understand how an organization's IT infrastructure affects its ability to use IT strategically and to support employees working anytime and anywhere. Finally, a manager must understand the important alternatives for managing the firm's IT resources and the IS organization itself, including the trade-offs involved.

This book, therefore, helps to prepare the student to be a more effective manager of IT as well as a more effective IT user. Throughout the text we present both the *individual* and the *organizational* perspectives. Today's graduates should be prepared to leverage IT tools to enhance their own productivity in the workplace and their career advancement, as well as for the good of an enterprise. However, managers also operate in a specific organizational context, and what they can accomplish depends upon the resources provided and the constraints imposed by each of their organizations. Through case studies, we provide examples of managers and IT professionals as they play different organizational roles in an attempt to leverage information technology.

Nevertheless, we live in a dynamic world in which technology can change at Internet speed. Therefore, most organizations have a mix of new and "legacy" (old) hardware, software, systems development approaches, and other management systems. Managers must be aware that they will be operating in an imperfect, highly dynamic world. They will need to find ways to continue to keep abreast of important developments and trends and to understand what is ideally possible today and tomorrow.

ORGANIZATION AND SCOPE

This fourth edition retains the overall structure of the third edition. After the stage-setting opening chapter, the book consists of four parts: "Information Technology," "Applying Information Technology," "Acquiring Information Systems," and "The Information Management System." Original, real-world case studies about the management and use of IT follow the opening chapter and each of the major parts of the book. In our view and in the view of many other users of the previous editions of this book, these case studies provide the most effective way of demonstrating IT management issues. The scenarios in the case studies are interesting and real, and the issues encountered are important. Discussions of these case studies tend to drive home some of the complexities of managing information technology.

The opening chapter focuses on the role of IT in the new digital economy or e-world, which is an underlying theme for the entire book. It is followed by the Midsouth Chamber of

Commerce case study, which is an excellent discussion starter on the roles of both business managers and IT managers.

The completely revised technology chapters, Chapters 2, 3, and 4, follow. These chapters are at the front of the book so that they can be easily skimmed by classes with a strong technology background, or they can be covered in traditional ways with students who are less advanced in their computer literacy. Although many of the core computer and network concepts remain unchanged, these chapters incorporate material on IT industry developments and new technologies. Enough depth is presented in these technology chapters to provide new learnings for almost all students, but the emphasis throughout the book is on understanding IT capabilities from a business perspective. The four case studies at the end of Part I focus on the selection of a hardware platform, the use of object-oriented programming, the issues associated with building a global IT infrastructure, and the establishment of a telecommuting environment.

Part II on “Applying Information Technology”—Chapters 5 through 7—uses the same application breakdown used in the third edition. Organizational systems (Chapter 5) are systems designed for the entire enterprise or major portions of it, including transaction processing systems for single functions, enterprise resource planning systems like SAP R/3, data warehouses, intranets, and groupware products like Lotus Notes. Managerial support systems (Chapter 6) are applications designed to support decision makers, such as executive information systems, expert systems, data mining applications, and geographical information systems. Electronic commerce applications (Chapter 7) are systems that are accessible to suppliers, customers, other business partners, and sometimes the public-at-large. An e-commerce chapter was first written for the third edition, and it has been completely revised for this edition to reflect the growing importance of e-commerce applications and their unprecedented impacts on the ways that individuals and organizations seek information. Five case studies are provided at the end of Part II, including such topics as the implementation of a strategic information system, the establishment of a Web site by a bricks-and-mortar company, the exploratory work in developing a Web-based business, and the advantages and disadvantages of going to work for a start-up IT firm.

Part III on “Acquiring Information Systems” begins with a chapter on basic IS concepts, followed by separate chapters focused on a custom application development methodology for IS professionals (using both the systems development life cycle and prototyping), a modified life cycle approach for purchasing large packaged systems, and organizational support for users developing their own systems and other end-user computing activities (including a management framework for managing end-user computing). For the fourth edition, the content on systems project roles and project management issues in the earlier editions has been incorporated into a new chapter (Chapter 12) on IT project management. These chapters are followed by an exceptional set of case studies covering the use of the systems development life cycle, purchasing applications software, application development by users, the make-or-buy decision, the use of an outside systems integration firm, business process reengineering, and the “big bang” implementation of an ERP system.

Finally, Part IV focuses on the management system required to manage information technology. Chapter 13, “Setting a Direction for Information Resources,” presents the entire framework for setting a direction, beginning with the information resources assessment, then the creation of an appropriate IT vision and architecture, and finally the development of both the long-run and short-run IT plans for the organization. Chapter 14 discusses the management of technology resources, focusing on the data resources of an organization. The concluding chapter on “Managing the IS Function” stresses 10 critical areas for IT management, including the role of the chief information officer, the role of the business manager, the management of outsourcing, the deployment of global IS, and the ethical use of IT resources. Eleven additional case studies follow these Part IV chapters, focusing on IT planning, ethical

and political issues, a global implementation of an ERP system, managing an IT organization during the first months of a merger, developing the IT infrastructure for international joint ventures, and providing IT support for a new international plant.

BEHAVIORAL OBJECTIVES

At the completion of a course designed around this book, our intent is that students will:

- Be able to identify ways to use IT to leverage business opportunities in different areas of responsibility.
- Be aware of current technology trends and IT-enabled business application trends.
- Be able to choose the best alternative way to acquire a new system based upon the type of application and the technological and organizational context.
- Be able to help oversee and guide the development or purchase of a new system that is of high quality and consistent with business goals.
- Understand the need for organizations to develop an information vision, an IT architecture, and strategic and operational IT plans and be able to participate in these processes.
- Understand the key concepts of an IT infrastructure and be familiar with alternative approaches for providing and managing this infrastructure.
- Be able to effectively partner with IS specialists, both internal and external to the organization, to obtain the expertise, services, and technical support required.
- Participate in the development of organizational policies and government legislation related to the potential impacts of IT usage on individuals, organizations, and society.

CASE STUDIES

We have found that real-world case studies are effective teaching tools and are very helpful to advanced management students in relating to this material. Therefore, we have included over two dozen original case studies at the end of the opening chapter and the four major parts of the book. Although some of the actual sites are heavily disguised, they are all faithful depictions of actual situations in specific organizations and have been carefully selected to illustrate major concepts in the book. We are greatly indebted to the organizations and individuals who served as the sources for our own original case studies published in this book, both camouflaged and not.

There are many lessons to be learned in each case study, often related to multiple chapters in the book. Similar to the third edition, we have grouped the case studies at the end of the most closely related part of the book. However, instructors may wish to use a given case study to illustrate the teaching points of chapters in a different part of the text, or an instructor may discuss a case study multiple times as the course progresses.

OTHER TEACHING AIDS

The Instructor's Guide includes syllabi for several courses (both undergraduate and M.B.A.) that have used this book. It also includes lecture notes on each chapter, answers to the review and discussion questions at the end of each chapter, teaching notes on the case studies, and a test bank for assistance in preparing examinations based on this book.

The Web site devoted to this textbook can be found at the Prentice Hall Web site. The address is www.prenhall.com/martin. Electronic downloads of presentation slides (Microsoft PowerPoint format) for each chapter are available to instructors, as well as "old favorite" case studies from earlier editions.

ACKNOWLEDGEMENTS

Our thanks go to our faculty colleagues at Indiana University and elsewhere who have used one or more versions of the book and have provided valuable feedback. We are also indebted to the reviewers of each of the four editions of this book. The list of these colleagues and reviewers is too long to include here, but we hope that they will accept our anonymous THANKS! We also thank the many Indiana University M.B.A. and undergraduate students at the Kelley School of Business who have provided suggestions to us directly.

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Our gratitude also goes to our spouses and families who have witnessed firsthand the time commitments required to update a textbook in the fast-moving field of information technology. Finally, each author thanks the other four for their intellect, professionalism, and camaraderie, which have made our coauthorship endeavors so worthwhile. We are all still continuing to learn from each other!

E. Wainright Martin
Carol V. Brown
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