
**CORPORATE INFORMATION SYSTEMS
MANAGEMENT: TEXT AND CASES**
FOURTH EDITION

APPLEGATE

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CORPORATE INFORMATION SYSTEMS MANAGEMENT

Text and Cases

F o u r

t i o n

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Preface

Corporate Information Systems Management, Text and Cases, Fourth Edition, is written for students and managers who desire an overview of contemporary information systems technology (IT)—computer, telecommunications, and office systems—management. It explains the relevant issues of effective management of information services activities and highlights the areas of greatest potential application of the technology. No assumptions are made concerning the reader's experience with IT, but it is assumed that the reader has some course work or work experience in administration or management.

Our purpose is to provide perspective on the business management implications of the information explosion—as evidenced by the doubling of the number of volumes in the Library of Congress between 1933 and 1966, another doubling between 1967 and 1979, and yet another doubling by 1987. Huge leaps in the growth of scientific knowledge have stimulated a dramatic increase in the number of new products based on new information technologies that range from the sophisticated super computer to the humble, ubiquitous facsimile machine to the exploding presence of the Internet. These products have influenced the very heart of a corporation's strategy and operations, and they will continue to do so. In many cases, the firm's competitiveness and its very survival are at stake. The radical changes in IT are coupled with the increasingly global nature of business; this puts an enormous burden on individual managers to keep abreast of events and to make intelligent decisions and plans. The broad objective of this book is to help managers harness the power of new technologies to enable them to make better decisions and more effectively manage their firms, thereby enabling them to compete more effectively.

Since the first edition of this book appeared in 1983, IT and its applications have continued to evolve dramatically. This fourth edition addresses this evolution by emphasizing issues related to development of an IT-

enabled strategy and organization design that permits a firm to simultaneously achieve the scale, scope, and efficiency that come from being large and the flexibility, speed, and responsiveness of being small. We highlight the special challenges related to electronic networking within and between organizations and pay particular attention to the key enabling technologies (e.g., client-server architecture, the Internet, groupware) required to implement the information infrastructure of the 1990s. Finally, we focus on a variety of options for managing the information resource—from “insourcing” to “outsourcing.” This book will help present and future managers identify, implement, and deliver effective information services.

Corporate Information Systems Management, Fourth Edition, is organized around a management audit of the information services activity. This management audit details all the questions that should be asked in identifying whether a firm is appropriately using and controlling IT. The book’s text, examples, tables, and figures convey and illustrate key conceptual frameworks. Chapter 1 presents an overview of the key questions to ask in assessing the effectiveness of an IT activity. Chapter 2 then presents frameworks we have found useful for analyzing and structuring problems in the field. Subsequent chapters show how IT can best be applied and how the IT activity can best be organized, planned, and controlled.

The material in this book is the outgrowth of directed field-based research we have conducted at the Harvard Business School since the early 1970s. We thank Dean John H. McArthur for making the time and resources available for this work.

We are particularly indebted to the many firms and government organizations that provided us with much time and insight during the course of our research. All of the examples and concepts in this book are based on observation of actual practice. Without the cooperation of these organizations, it would have been impossible to prepare this Fourth Edition.

We are especially grateful for the many valuable suggestions and insights provided us by our Harvard Business School colleagues Bill Bruns, Jim Cash, Peter Hagstrom, Richard Nolan, Donna Stoddard, John Sviokla, and Shoshana Zuboff as well as Professors Eric Clemons of the Wharton School, Janis Gogan of Bentley College, Benn Konsynski of Emory University, Charley Osborn of Babson College, and Keri Pearlson and Sirkka Jarvenpaa of the University of Texas/Austin. In addition, we acknowledge the valuable work of our doctoral students and research assistants Melinda Conrad, Kevin Davis, Carin Knoop, Chris Marshall, C. J. Meadows, Katherine Seger-Weber, and H. Jeff Smith. Lynn Salerno and Bernard Avishai, in their editorial capacity at the *Harvard Business Review*, and editors Barbara Feinberg and Paul McDonald provided valuable assistance. We would also like to express our appreciation to Maureen Donovan, Mary Kennedy, and Elayne Nascimento, who typed and edited numerous versions of the work.

Lynda M. Applegate, F. Warren McFarlan, James L. McKenney

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Chapter

1

The Challenge of Information Systems Technology

INTRODUCTION TO IT MANAGEMENT

The rapid evolution and spread of information systems technology (IT)¹ during the last 40 years is challenging both business and IT management to rethink the very nature of the business. New industry players are emerging (e.g., cable operators, systems integrators), and new internal organizational structures are being defined. Major investments in computer hardware and software are required to capture the benefits of powerful new technologies. Systems are being developed that profoundly affect how firms operate and compete; not only large corporations, but also mid-size and very small firms (that is, under \$1 million in sales) are feeling the impact. IT's influence in large corporations is pervasive, affecting the smallest departments and managerial decision-making processes to an extent not even visualized 10 years ago.

Because many senior managers received their educations and early work experiences before the wide-scale introduction of computer technology, or in environments where the capabilities of IT were very different than those of today, they often fail to understand technology and lack sufficient grasp of the issues to provide appropriate managerial direction. In addition, many IT managers, given their early experiences with technologies so different from those of the 1990s, are also finding themselves unprepared to deal with current issues. (For example, understanding the programming challenges of

¹In this book, IT refers to the technologies of computers and telecommunications (including data, voice, graphics, and full motion video).

mainframe-based COBOL—a systems development language that is still in common use within many organizations in the 1990s—does not prepare a person to deal with the challenge of implementing systems based on client-server architectures, object-oriented programming languages, and other key technologies for the 1990s.)

Over the past decade and a half, virtually all of the frameworks that guide IT management practice have been challenged. IT managers must continually struggle to address day-to-day operating problems, while assimilating new technologies and managerial approaches. IT managers who are not committed to continuing personal development quickly become obsolete; those who cannot similarly develop their employees find their businesses obsolete.

This book is aimed at two different audiences. The first is the general manager who is responsible for providing direction for all business activities. For this group we offer frameworks for evaluating IT activity in the firm. The book defines policies that must be executed and provides insights into the specific challenges of execution. Methods for integrating IT management with the overall activities of the firm are suggested.

For its second audience, senior IT management, this book provides an integrated view of IT management issues for the 1990s. Key frameworks for organizing and understanding a bewildering cluster of operational details are identified. The focus for IT senior managers is to move from analysis of the “bark composition of individual trees” to an overall perspective of the IT “forest” and its management challenge. The book thus integrates the needs of two quite different—though operationally interdependent—audiences and provides a common perspective and language for communication.

It would be a serious mistake to think of the problems of IT management as totally different from those found in other business areas. The issues of IT organization, for example, can be approached using general organization design theory.² Issues of IT strategy formulation are heavily influenced by theories of industry analysis³ and business planning.⁴ Notions of budgeting, performance measurement, transfer pricing, profit center management, and so forth, from the general field of management control are also relevant here.⁵ In addition, the fields of operations and technology management

²For example, see P. Lawrence and J. Lorsch, *Organizations* (Boston, MA: Harvard Business School Press, 1986).

³For example, see M. Porter, *Competitive Advantage* (NY: Free Press, 1985) and A. Chandler, *Scale and Scope: The Dynamics of Industrial Capitalism* (Cambridge, MA: The Belknap Press of Harvard University Press, 1990).

⁴For example, see J. Bower, *Managing the Resource Allocation Process: A Study of Corporate Planning and Investment* (Boston, MA: Division of Research, Harvard Business School Classics, 1986) and J.B. Quinn, H. Mintzberg, and R. James, *The Strategy Process* (Englewood Cliffs, NJ: Prentice Hall, 1988).

⁵For example, see R. Anthony, *The Management Control Function* (Boston, MA: Harvard Business School Press, 1988) and K. Arrow, “Control in Large Organizations,” in *Behavioral Aspects of Accounting*, edited by M. Schiff and A. Lewin (Englewood Cliffs, NJ: Prentice Hall, 1974).

have aided our understanding of the management of IT operations (e.g., networks and data centers).⁶ Insights from all of these disciplines are relevant for our understanding of IT management issues.

Concepts of IT Management

Integrating the IT “business” into the rest of the firm poses many organizational design and strategy formulation challenges. The following four concepts are essential for an understanding of the successful management of IT.

Strategic Relevance. The strategic impact of the IT activity varies among industries and firms and, over time, within an individual firm. Like the telephone, IT can be used in all firms to enhance operations; but, in a growing number of firms in the 1990s, it is also a core differentiator and strategy enabler. Further, IT may be more significant to some operating units and functions within a firm than to others. This notion of a variation in strategic relevance is critical for understanding the diversity of potential IT management and operational approaches.

Corporate Culture. The corporate culture—embodied by the organization’s shared values and operationalized in its processes (e.g., the approach to corporate planning, philosophy of control, and speed of core product/technological change)—influences how the IT business should be managed. In addition, there are also generic tools that define the “state-of-the-art”; client-server IT architectures and graphical user interfaces are examples of generic IT tools for the mid-1990s. Combining these generic tools with the values, culture, and processes of a particular firm is the art of management. A combination that works in one corporate environment can fail abysmally in another.

Contingency. IT management is also influenced by the notion of contingency. Because IT management systems were often introduced during the 1960s and early 1970s to simplify information-intensive transaction processing, structured and mechanistic approaches resulted in great improvement. But as these new approaches and tools were assimilated into the firm, the initial surge of value from their introduction often gave way to frustration. In many cases, because of their inherent rigidity, these approaches answered some types of challenges very well and others not at all. For example, the emergence of PCs in the 1980s enabled end-user approaches to information processing, which, in turn, posed challenges to

⁶For example, see K. Clark and T. Fujimoto, *Product Development Performance* (Boston, MA: Harvard Business School Press, 1991) and J. Heskett, *Managing in the Service Economy* (Boston, MA: Harvard Business School Press, 1986).