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THE **T-FORM**  
**ORGANIZATION**

**Using Technology to  
Design Organizations  
for the 21st Century**

# The T-Form Organization

Using Technology to Design  
Organizations for the 21st Century



Jossey-Bass Publishers • San Francisco

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# The Jossey-Bass Management Series

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*To Ellen*

## Preface

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For centuries, managers have designed organizations. Over time, the most popular organization structure has been a hierarchy, much like an army's chain of command. To compete in the twenty-first century, however, organizations will have to be far more flexible than a hierarchical structure allows them to be. In fact, *the traditional organization that fails to redesign itself in the next decade is likely to disappear.*

In designing organization structures, managers have used such concepts as span of control, authority versus responsibility, reporting relationships, formal communications channels, and similar concepts. They have also designed departures from a strict hierarchy; for example, professional service firms are structured somewhat differently than are most manufacturing companies. However, no matter in what industry we look, most businesses essentially consist of layers of managers with well-defined reporting relationships.

Yet this picture is now starting to change. During the last forty years, we have experienced a revolution in information technology (IT), a revolution that will equal or exceed the industrial revolution in its impact on business. In the early days of computers, we could hardly call technology revolutionary. However, computers and communications technologies have evolved into powerful and sophisticated tools, and some managers are now using these tools to create radically different types of organizations.

The purpose of this book is to show managers how they can use information technology, combined with conventional design

approaches, to create a technology-based organization, the *T-Form organization*. This book is intended for managers of all types of organizations, including manufacturing firms, service companies, and nonprofits. While senior managers are heavily involved in designing organizations, managers at all levels make decisions that affect the structure of the organization and the design of the work; thus the ideas presented in this book should help a wide range of managers design organizations and their components. There have been many books written recently about networked organizations, virtual organizations, and similar “businesses of the future.” This book goes beyond description; its unique contribution is a focus on the IT design variables that managers can use to develop a T-Form organization. A *design variable* affects organizational form once it is applied in the organization. For example, through the design variable of *electronic communications and linking*, you can create an organization in which your employees do not work together in a physical office. This book shows you how to use design variables in a step-by-step process to produce variations of the T-Form organization.

## Overview of the Contents

In Part One, I introduce the T-Form organization. Chapter One describes the characteristics of this new form. Given the capabilities of modern information technology, how will successful organizations be structured in the future? Chapter Two presents conventional design variables and the new variables for design based on information technology. This chapter is key to building the T-Form organization. Chapter Three discusses how to prepare to design a new organization and the pitfalls you may encounter; it is especially concerned with creating and maintaining flexibility in organizations.

It is important to understand the full impact of IT on the business environment if we are to design our organizations around it. I address this topic in Part Two. In Chapter Four, we see how tech-

nology has affected corporate strategy, while Chapter Five looks at the organizational implications of electronic markets. There is much excitement today about business process redesign or *reengineering*; Chapter Six presents a detailed example of using technology to reengineer a process. It then expands that concept to one of reengineering the entire organization, something that may be necessary if you want to develop the T-Form organization quickly rather than over a long period of time.

In Part Three, I show how to apply the IT design variables from Chapter Two to the design of the T-Form organization. Chapter Seven describes how to use IT to change the structure of an organization. Chapters Eight and Nine focus on technology to change operations and customer service, respectively. Chapter Ten is devoted to groupware, a communications tool that many organizational consultants and managers feel will be one of the most important contributions information technology will make to organizations. IT gives managers unprecedented abilities to share data and to create a repository of a firm's knowledge for many employees to access.

The technology infrastructure is of particular importance when using IT design variables. In Part Four, I discuss computers, communications, and networks—the technologies that have made IT design variables possible. Chapter Eleven describes the dramatically expanding reach of the networks that enable the T-Form organization. Chapter Twelve discusses the kind of technology that is available for building the T-Form organization; almost everything needed is here today at a reasonable price!

Change is never easy, and the last part of this book discusses implementation. The most favorable situation you can be in, of course, is starting a new firm. It is a formidable challenge to move to the T-Form in a large bureaucratic organization. Chapter Thirteen presents some ideas for creating the T-Form organization and describes approaches to using IT design variables successfully. Finally, Chapter Fourteen reviews IT design variables, advantages of the T-Form structure, and steps in creating the T-Form



organization. A short glossary explains some of the technical terms used in the book.

Throughout, you will find numerous examples that illustrate how different firms have used IT design variables to design parts of a T-Form organization. Some of these examples, unlike those in many other books, are presented in extensive detail. For each suggestion I make about how to use an IT design variable, I present examples of one or more companies that have successfully employed that variable, for example, to dramatically improve operations or customer service.

My objective is to convince you that information technology design variables provide an exciting new set of tools for creating dynamic, flexible, and responsive organizations, and that when you combine IT and conventional design variables, the most natural outcome is a T-Form organization. I believe that firms that fail to take advantage of IT design variables to evolve toward a T-Form structure are unlikely to survive the turbulent global business environment of the coming years. The challenge for the manager is clear; I have written this book to help you meet it.

## Acknowledgments

I gratefully acknowledge Jack Baroudi at New York University for his contributions to developing the IT design variables in Chapter Two. Jon Turner at New York University provided a superb account of Oticon, a company discussed in Chapter Six.

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I am forever grateful to my wife, Ellen, for her continued support and encouragement of my writing efforts.

*Summit, New Jersey*  
*August 1995*

Henry C. Lucas, Jr.

## The Author

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Henry C. Lucas, Jr., is research professor of information systems at the Leonard N. Stern School of Business, New York University. He received his B.S. degree (1966) from Yale University and both his M.S. degree (1968) and Ph.D. degree in management (1970) from the Sloan School of Management at M.I.T. Lucas has served on the faculty of the Graduate School of Business at Stanford University and has visited at the European Institute of Business Administration (INSEAD) in Fontainebleau, France. He has also done research at the IBM European Systems Research Institute in La Hulpe, Belgium, and at Bell Communications Research in Morristown, New Jersey.

Lucas's research interests include the management and implementation of information technology, systems analysis, expert systems, and the impact of technology. His articles have been published in journals such as *Management Science*, *Decision Science*, the *Sloan Management Review*, *MIS Quarterly*, and the *Journal of Organizational Computing*.

Lucas has authored several books, including *Managing Information Services* (1989), *The Analysis, Design, and Implementation of Information Systems* (4th ed., 1992), and *Information Systems Concepts for Management* (5th ed., 1994).

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## Part One

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# *A New Way to Organize*

The last four decades have brought dramatic social and economic changes, including the rise of the global firm, the movement of the countries of the former Soviet Union and Eastern Europe toward free market economies, and the surge in the economies of China and the rest of Asia. Concomitantly with these globally important changes, there has been a revolution in information technology (IT). For businesses, the end result from these events has been and continues to be tremendous new opportunities along with significant competitive pressures.

Evidence for the intense competition can be seen in the fate of blue-chip companies in the United States: firms like General Motors, IBM, Westinghouse, Digital Equipment Corporation, and others have experienced dramatic reversals. Dissatisfied stockholders and boards of directors have replaced senior management in each of these firms, and the new managers have undertaken extensive restructurings. It is likely that the IBM of the year 2000 will have less than half the number of employees it had in the 1980s!

While large companies have encountered significant problems in remaining competitive, the economy in the United States has offered tremendous opportunities for new companies, particularly those that have learned to take advantage of information technology. Since they do not begin with the kind of multilayer bureaucracy typical of an IBM or a General Motors, these companies have been able to experiment with different kinds of organization structures. Certainly, we cannot compare small start-up companies with the world's largest manufacturing organizations on most fronts, but

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we have to wonder if these entrepreneurial firms have discovered a new way to organize themselves. Suspicion that there may be a better way to organize is heightened when we look at some large firms or at some divisions of very large firms that also have found more effective ways to compete. Information technology has contributed to many of the benefits certain organizations have enjoyed from their restructuring efforts.

Part One introduces the T-Form, or technology-based, organization. Chapter One describes how information technology can help managers design an organization with the features needed to compete in today's economy: for example, a "flat" organization structure, with few layers of management. Chapter Two presents a series of IT design variables, building blocks to be combined with traditional organization design variables to create variations of the T-Form organization. The third chapter describes how to prepare to design or redesign an organization. It also points out potential pitfalls on the road to the T-Form organization.

Is the effort required to design a new technology-based organization worth it? Managers may have little choice; *I believe that firms will have to adopt the T-Form organization to survive in the highly competitive global economy of the twenty-first century.*

## Chapter One

# The T-Form Organization: Flat and Fast

The revolution in information technology during the last forty years offers managers new ways to design highly efficient, competitive organizations. Many experts have speculated on the impact of information technology on organization design. As long ago as 1958, Leavitt and Whisler predicted significant changes in organizations as a result of new IT. They stated: "Over the last decade [the 1950s] a new technology has begun to take hold in American business, one so new that its significance is still difficult to evaluate. While many aspects of this technology are uncertain, it seems clear that it will move into the managerial scene rapidly, with definite and far-reaching impact on managerial organization" (p. 41). Many of the changes Leavitt and Whisler predicted, such as reductions in the number of management layers and in the total number of middle managers, are now taking place.

It is hard to select one particular organization form and claim that it represents *the* structure of the future. There are hundreds of thousands of organizations, and it is unlikely that a manufacturing company will develop a structure that looks exactly like that of a law firm. However, we do know that technology makes certain organizational forms attractive and that there are pressures moving organizations in particular new directions. The combination of these external pressures and the new technology has the potential to change the way firms are structured, and the shape of these changes, at least, can be defined.

### Information Technology and Organization Design

The purpose of this book is to describe how managers can use information technology to design new organizations or redesign existing ones. It presents a series of new information technology design variables to be used in creating a technology-based, or *T-Form*, organization. A number of examples illustrate how these technology-based variables can be used to design the T-Form organization that is appropriate for each firm's unique business environment.

My basic argument is that the information technology developed during the last four decades, particularly communications networks and software to support individuals and groups in their tasks, not only can be used but must be used in organization design. *Ideally, instead of designing an organization and adding IT later, managers will use technology actively in designing their organizations in the first place.* I believe that now and in the years to come, T-Form businesses will significantly outperform firms with more traditional organization structures. Indeed, it will be a rare traditionally structured organization that survives in the twenty-first century.

What has happened to make IT a vital element in designing organizations? The first information systems processed basic transactions, often where there was intense paperwork. These systems handled orders, billing, accounting, and production control; improving the processing of this paperwork made a significant contribution to successful operations. In the last five years, however, some organizations have found ways to employ technology that go well beyond simple transaction-processing applications. Out of the convergence of communications and computer technologies, they have created new opportunities in the way work is organized. The first transaction-processing systems altered workflows and tasks for one department or a small group of departments. Today's technology provides managers with opportunities to create new structures for entire organizations.

In the next chapter, I examine the new IT organization design



variables. While many firms are currently employing one or a few of these variables, I am unaware of an organization that has taken full advantage of IT in designing or restructuring itself. It is my hope that this book will help companies see many more of the opportunities that information technology offers them.

### The T-Form Organization

What are the characteristics of the T-Form, or technology-based, organization? The manager who designs this new type of organization has a great deal of freedom in choosing its structure. IT organization design variables can be used in a number of different ways. But given the objective that most firms have today of being highly efficient and minimizing overhead, I suggest that most managers will employ technology to produce an organization with a relatively flat structure—that is, a structure that has a minimum number of layers of management. The classical approach to organization design stresses concepts such as span of control. How many subordinates can a supervisor manage? Numbers like seven or eight are popular answers to this question. Other designers use a pragmatic standard, saying, “When a person has too much work to do, we provide him or her with subordinates to help out.”

Instituting a rigid span of control and providing subordinates whenever needed are very expensive ways to design organizations. By following these design variables over the years, firms have built up huge bureaucracies that are very costly to support. The T-Form organization substitutes technology for layers of management. First, communications technology demolishes the old idea of span of control: now, a manager can stay in contact with and “supervise” a large number of subordinates electronically. Of course, compared to the close supervision made possible by sitting near one’s subordinates, this supervision will be more remote and will require much more trust between manager and subordinate.

Second, technology, not more subordinates, can be used to help