

Networks and Organizations

STRUCTURE,
FORM,
AND ACTION

Edited by
Nitin Nohria and
Robert G. Eccles

H A R V A R D B U S I N E S S S C H O O L P R E S S

**NETWORKS
AND
ORGANIZATIONS:
STRUCTURE, FORM, AND ACTION**

**Edited by
Nitin Nohria
and
Robert G. Eccles**

**Harvard Business School Press
Boston, Massachusetts**

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Printed in the United States of America

98 97 96 95

5 4 3 2

Library of Congress Cataloging-in-Publication Data

Networks and organizations : structure, form, and action / edited by
Nitin Nohria and Robert G. Eccles.

p. cm.

Papers originally presented at a conference held in 1990,
sponsored by Harvard Business School.

Includes bibliographical references and index.

ISBN 0-87584-578-9 (pbk: acid-free paper)

1. Organizational behavior—Congresses. 2. Social networks—
Congresses. I. Nohria, Nitin, 1962– . II. Eccles, Robert G.

HD58.7.N47 1992

302.3'5—dc20

92-11442

CIP

Originally published in hard cover by the Harvard Business School Press.

The recycled paper used in this publication meets the requirements of the American
National Standard for Permanence of Paper for Printed Library Materials
Z39.49-1984.

228.04

**NETWORKS
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Preface

About three years ago, Nitin suggested to Bob that the Harvard Business School sponsor a colloquium on networks and organizations and publish a volume of papers presented at the colloquium. (Later, Harrison White would remember that Bob had a similar idea several years before that, which to this day Bob cannot recall. But maybe that's why he thought Nitin's idea was a good one.) The reason for such a conference was the recent popularity of the term "network" among academics and managers who are interested in organizations. This term had played a prominent role in Nitin's research on the 128 Venture Group and in Bob's work, in collaboration with Dwight Crane, on investment banking. In both of these studies an important underlying issue was whether "network" referred to certain characteristics of any organization or to a particular form of organization. We hoped the conference would help resolve this and other related issues.

Having decided to do a conference and after securing the much-appreciated financial support of the Division of Research at the Harvard Business School through the sponsorship of our research directors, Professors Jay Lorsch and Warren McFarlan (past and current Senior Associate Deans of Research, respectively), we then had to decide whom to invite to the conference and to devise a strategy to persuade them to come. Having learned something about how networks work from our own research, we first met at Columbia University with Ron Burt, Mark Granovetter, and Harrison White in March 1990. We discussed the idea of the conference with them, got their promise to participate, and developed a list of people to contribute papers and serve as commentators on the sessions. We contacted the people on our list and were pleased at their positive response. Potential participants were told that the purpose of the colloquium was to bring together a number of prominent scholars who had done work or were interested in the concept of networks for studying

organizations, as well as some thoughtful managers. Our objective was to assess the current state of knowledge about networks in order to determine its present and potential future contribution to the study of organizations.

The format of the conference, as suggested by Warren McFarlan, emphasized discussion in small and large groups. Small study groups of five to eight people who discuss a case before the large class discussion are a tradition at Harvard Business School, and we applied this social technology to the conference. Although some of the participants were initially skeptical of this approach, it worked out well. In addition to the obvious benefits of giving people the opportunity to exchange ideas in an informal setting where there is plenty of "air time" for everybody (always a scarce good at a conference of talented and articulate people), we wanted to ensure that the academics had sufficient opportunity to get the views and reactions of the managers who attended. Toward that end, the final session of the conference was devoted to a panel discussion by the managers. And while one of the academic participants left with a grumbling pronouncement that he "had nothing to learn from them and couldn't imagine being interested in what they had to say," we believe that most of the other participants found this valuable. That some did not simply illustrates again the difficulties faced by those who attempt to bring theory and practice together in both body and spirit.

Later than we hoped, and later than we promised the conference participants and our publisher—the fate of so many volume editors—this book is now complete. We believe it is a good representation of the state of knowledge about networks as applied to the study of organizations at the present time.

We would like to thank all the participants at the conference for writing papers and for providing feedback and commentary on the papers. Special thanks are due to Peter Marsden, Jeff Pfeffer, Richard Scott, and Art Stinchcombe, who played the role of discussants at the conference and provided valuable feedback to the authors of the papers. The timely revisions we received reflect the quality of this feedback and the thoughtfulness of the authors in incorporating it. We would also like to thank our editor, Carol Franco, for her enduring patience and good humor as she watched several deadlines quietly slip away. Many thanks also to Ani Kharajian and Jennifer Wilson, who helped organize the conference. But it was Rita Perloff's perseverance and grit that eventually enabled us to put this volume together. Finally, for the readers of this volume who are more interested in the product than in the process that produced it, we hope that it will stimulate their own thinking in the study and use of networks in organizations.

Plan and Summary of the Book

The chapters in this book are organized in four sections. Section I, *Linking Structure and Action*, brings together theoretical contributions that deal with the relationship between structure and action. In Chapter 1, Mark Granovetter lays out a paradigmatic orientation to explanation that is shared by most of the authors in this book. His main assertions are that (1) economic action (like all action) is properly seen as embedded in ongoing network of relationships; (2) economic goals are typically pursued alongside such noneconomic goals as sociability, approval, status, and power; and (3) economic institutions (like all institutions) arise from and are maintained by ongoing processes of social construction.

In Chapter 2, Ron Burt develops a more formal model of the social structure of competitive arenas. He argues that social capital—an actor's relationship with other players—is as, if not more, important than the financial and human capital the actor brings to the competitive arena. This is because social relations are conduits for access to information and can generate information benefits. They can also be the source of control benefits obtained by taking advantage of competition between contacts or negotiating between disorganized contacts. Competitive advantage, therefore, obtains to those players with structural autonomy or a network optimized for what Burt calls "structural holes" (gaps between nonredundant contacts).

While Ron Burt views networks as a stable social topology, Harrison White, in Chapter 3, looks at networks as process—being continually generated as actors "control and manoeuvre in and around" organizations. If the image of social networks in Burt's model is a crystalline grid, in White's it is a repeating polymer, wherein new strings and ties are constantly formed and broken. Therefore control, according to Harrison, consists "principally in achieving constant changing of the scene for others. Any ongoing organization that is not changing is a battlefield monument, a monument to the successful overturn of control." This notion of control

is not inconsistent with that offered by Burt. In both cases, control lies in keeping others from getting organized, in maintaining the disorganization of one's contacts, thereby always keeping open one's choices. The difference lies in the more active use of agency and delegation outlined by White as means of getting control. In Burt's arena it is not clear where structural holes come from or why they persist; in White's arena the gamings and countergamings by which holes are created and filled is seen more clearly.

In Burt's (and implicitly in White's) view, the attributes or attitudes of actors contributes little or nothing in explaining their actions. Indeed, these factors lead to spurious causal explanations. What matters is the structural location of the actors. In Chapter 4, Paul DiMaggio takes exception with this view. He argues that explanations of action can never be purely structural. This is because in orienting themselves towards one another and the world, actors rely on typifications (based on attributes) and accounting systems (based on attitudes). Practical action, therefore, is always guided by structural constraints as well as by cognitive (or normative) orientations that are built up on attributes and attitudes. This, DiMaggio argues, is especially true when action must take place in a fluid, dynamic, and emergent context in which the structure of network relations is unstable, and hence a less reliable guide for action than the situations in Burt's models, where the structure of relations is fairly stable, and hence tightly constrains action. To illustrate his point, DiMaggio analyzes the manner in which individuals were recruited to help form and manage the Museum of Modern Art. He shows how the identification and selection of individuals to join that risky and innovative project was guided by both structural and cognitive considerations. In a separate analysis, DiMaggio shows how much about organizations can be understood as a consequence of the interaction of three factors: the organization's relational network, the distribution of its member's attributes, and its formal structure.

The extent to which the action of individuals is guided by universal norms of role performance or by the structure of one's ties to particular others—a crucial question raised by DiMaggio—is the focus of Carol Heimer's thesis in Chapter 5. She argues that obligations to act are always "simultaneously obligations to perform tasks in a universalistic way as well as obligations to behave responsibly in one's relations to particular network partners." This simultaneity can be the source of considerable tension. As Heimer points out, "whenever we think about organizational members developing ties to particular others, we then worry about universalistic standards being undermined by nepotism, friendship, old-boy ties, and the like. At the same time, though, we recognize that in some instances ties to particular others are part and parcel of a person's job [as in doctor-client and mentoring relationships]." Bureaucracies, according to Heimer, attempt to resolve this tension by mandating universalistic norms, but that is a poor solution since it is "only by helping friends that anyone can ever do business." To be effective, indeed for networks to

work, they must be able to combine the virtues of universalism with those of particularism. This can be accomplished if networks are governed by a care orientation (not to turn away from your responsibility to someone) as much as they are governed by a justice orientation (not to treat someone unfairly).

In Chapter 6, Herminia Ibarra elaborates on another issue raised by DiMaggio in Chapter 4. She underscores DiMaggio's view that understanding the alignment between the formal and emergent patterns of interaction in an organization is of considerable importance in predicting its tone and style. She goes further to assert that the nature of this alignment shapes both the constraints as well as the opportunities for actors trying to get things done. Thus, she suggests, the appropriate strategy for action is contingent on the nature of the alignment between the prescribed and emergent networks in which the actor is embedded, as well as on what it is that the actor is specifically trying to accomplish. For instance, innovative and critical action in "integrative" organizational settings where there is little overlap between the prescribed and emergent networks may depend on a strategy that maximizes the kind of structural autonomy outlined by Burt, whereas to accomplish routine actions in a bureaucratic organizational setting where there is considerable overlap between the prescribed and emergent networks may depend on a strategy that maximizes cohesive relations. This contingency perspective on the relation between structure and effective action is Ibarra's key contribution.

Whereas Section I sidesteps the issue of the implications of different types of ties for action in networks, Section II, *Different Network Ties and Their Implications*, confronts this issue head-on. Its chapters address several dimensions along which ties can vary: (1) their basis—that is, whether they are based on affect, advice, task, or talk; (2) their intensity—whether they are strong or weak, occasional or frequent; (3) their unit of reference—whether they are defined by boundaries drawn around the primary subunit, the department of which the subunit is a part, the organization of which the department is a part, and so on; and (4) the media through which the interaction occurs—whether the interaction is face-to-face or via other telecommunication media.

In Chapter 7, Daniel Brass and Marlene Burkhardt investigate the relationship between the centrality of individuals in different social networks in an organization and their power. They examine centrality with respect to four different units of reference (subunit, department, organization, and dominant coalition) and three networks (workflow, communication, and friendship). Their results indicate that an actor's centrality in the department and dominant coalition, especially in the communication network, most strongly contribute to his or her power. Brass and Burkhardt's analysis highlights many of the complexities involved in network analysis.

Chapters 8 and 9 deal respectively with strong and weak ties and their role in different organizing efforts. David Krackhardt, in Chapter 8, attempts to explain the failure of an effort to organize a union in a small

entrepreneurial firm in Silicon Valley. In his view, the unionization effort failed primarily because the leaders of the union effort failed to take into account the network of strong ties based on affect and friendship among the members of the firm. While the union concentrated on and was able to persuade employees who were central in the firm's advice network, they ignored others who were more central in the firm's friendship network. This, in the final analysis, led to their failure. Based on this case, Krackhardt argues that centrality in a network of strong ties can in some organizing efforts—particularly those that require a significant commitment of trust—be just as important, if not more important, than the well-known advantages of being central in networks of weak ties.

In Chapter 9, Nitin Nohria examines the organizing efforts of actors involved in trying to create, manage, and profit from new entrepreneurial ventures in the Route 128 area. A central aspect of these organizing efforts is the search for various kinds of information. Nohria describes an innovative institution—the 128 Venture Group—that acts as a generator of bridging ties, thus facilitating the search objectives of its participants. His analysis adds another example to the long list of previous studies that document the importance of weak or bridging ties in the search for information. In addition, he supports DiMaggio's assertion that actors use typifications and accounting schemes to orient themselves toward one another and to identify and select others during their organizing efforts. Finally, Nohria shows how the network of relations in any social system result from unique historical processes, which explains why there are so few regions like Route 128 and why institutions such as the 128 Venture Group are not more prevalent nor universally successful.

The concluding chapters in Section II deal with an increasingly important issue in contemporary organizations—to what extent can ties based on face-to-face interaction be replaced by ties based on electronically mediated interaction? Advances in telecommunications and information technologies have created new possibilities for interaction that circumvent the time-space barriers of face-to-face communication. This has led to the creation of global electronic networks and utopian visions of network organizations that are based entirely on electronically mediated interactions. Both chapters warn against taking this utopian vision too seriously. In Chapter 10, James McKenney, Michael Zack, and Victor Doherty relate how their study of the communication patterns of a software development team revealed that electronic mail and face-to-face interaction served as complementary channels of communication. While electronic mail was used by the members of the team to monitor the status of projects, send alerts, broadcast information, and invoke specific actions, face-to-face was used to define and discuss solutions to problems and to maintain context by alerting the group to changing task and environmental circumstances. Electronic and face-to-face interaction also tended to be sequenced over time in a manner that expedited task performance while maintaining shared definitions of the context. Thus McKenney et al. conclude that face-to-face is vital to the creation of a shared con-

text and that effective electronic mail relies upon the existence of such a context.

Nitin Nohria and Robert Eccles, in Chapter 11, build on this and other theoretical and empirical studies comparing face-to-face and electronic interaction, to make the even stronger claim that as the amount of electronic interaction in any organization increases, the amount of face-to-face interaction will also have to increase (though not in the same proportion). Otherwise, they argue, the network will lose its robustness and become ineffective. Network organizations, in their view, are neither synonymous with, nor can they be built upon electronic networks.

Section III, Organizations and Their Environments as Interorganizational Networks, contains three chapters that examine the relation between organizations and their environment in the biotechnology industry. All three analyze the pattern of interlinkages among the various organizations involved in this emerging industry.

In Chapter 12, Stephen Barley, John Freeman, and Ralph Hybels study the ecology of the biotechnology industry. They examine the distribution of various types of organizations in the industry and the various types of alliances among them. They investigate which firms are more central in the network and find those positions occupied by publicly held dedicated biotechnology firms and diversified corporations, especially those from Western Europe. They also find well-developed niches in the industry based on distinct forms of participation in the network. Firms in each niche exhibit similar patterns of involvement in strategic alliances as well as similar patterns of engagement in different markets. Thus "niche as defined by market constraint corresponds, in part, to niche as defined by characteristic patterns of interorganizational ties." This duality, according to Barley, Freeman, and Hybels, suggests that "networks of interorganizational relations are maps both of and for strategic action."

Bruce Kogut, Weijian Shan, and Gordon Walker examine this proposition more closely in Chapter 13 by studying the dynamics of alliance formation in the industry. They find that the decision to cooperate is "nested within the changing structure of the network as determined by the prior history of cooperation." Furthermore, they find that over time the decision to cooperate depends less on the attributes of the firm and more on the firm's previous cooperative history. Kogut, Shan, and Walker conclude that structural position strongly influences the strategic behavior of organizations, but that individual firm attributes do matter.

Both Barley et al. and Kogut et al. ignore the question of what motivates firms in the biotechnology industry to cooperate with one another and whether the dense pattern of alliances in the industry represents a stable state or a transitory phase prior to an eventual consolidation. In Chapter 14, Walter Powell and Peter Brantley try to address these questions. In their view, the pattern of alliances in the industry cannot be understood in terms of the dynamics of niche formation or in terms of economizing on transactions costs. Instead, these alliances develop "because the range of relevant skills needed to compete in biotechnology

cannot easily be brought under one roof." The evolution of the network of relationships in the biotechnology (and other knowledge- and innovation-intensive) industries must therefore be understood as the evolution of a learning through networks system. This learning perspective suggests that the network structure of the biotechnology industry is not necessarily a transitory phase, but may have properties that make it viable and robust over time.

Section IV, *Network Forms of Organization*, consists of five chapters that deal with different forms of network organization—the entrepreneurial network firm, small-firm networks such as those found in several industrial districts in Italy, and network-like economies such as those found in Japan, Korea, and Taiwan. These forms of organization have recently received enormous attention because they are seen as being more competitive alternatives to the usual bureaucratic and market modes of organization.

In Chapter 15, Wayne Baker tries to clarify some of the semantic ambiguity surrounding the term *network organization* (since all organizations can, in principle, be conceived of as networks) by offering a precise definition of this specific organizational type: "an organization *integrated* across formal groups created by vertical, horizontal, and spatial differentiation for any type of relation." Observing that previously known network organizations have typically evolved unplanned or resulted from the redesign of a non-network organization, Baker studies a real estate service firm that was explicitly designed ex-ante to have a network form. Baker found that although the firm was not completely integrated, it came close to the ideal definition of a network organization since none of the dimensions of formal differentiation were barriers to interaction for the firm as a whole or for the operating core of dealmakers. Though Baker does not tell us how the firm built or maintains this network form, he does highlight its comparative advantage: "as a flexible and self-adapting organization, it is well-suited to unique customized projects, close customer and supplier involvement in the production process, and complex, turbulent environments."

These are also the widely acclaimed advantages of small-firm networks—a form of organization that is the subject of Chapters 16 and 17. One of the earliest observers and advocates of small-firm networks, Michael Piore tries, in Chapter 16, to outline the economic logic of their growth and development. Using the logic of mass production as a comparative benchmark, he suggests that if the economics of mass production was based on a detailed division of labor limited only by the extent of the market for the goods produced, the economics of small-firm networks is based on a general division of labor that enables growth through the generation of new combinations.

If Piore strives to understand the economic logic of small-firm networks, Charles Perrow strives to understand their organizational logic. In Chapter 17, Perrow who had previously argued that "small is trivial in a world of giants," now tries to argue why "small will not be trivial if many

small organizations form a *network*." He addresses several questions about the scope and viability of small-firm networks (SFNs), such as their product range, their ability to develop new products, their skill set, the extent to which they exploit labor, the reasons for their appearance, and the prospects for their permanence. He develops further propositions for how small-firm networks affect hierarchy, costs, power among organizations and power in the community, the distribution of authority and the distribution of wealth, the production of trust, and the location of infrastructures. Perrow ends up admiring SFNs, though he is quick to caution that in some circumstances these networks can be stifling and pernicious to change.

The final two chapters in Section IV look at network forms of organization at an even higher level of analysis, the structure of national economies. Both these chapters contrast the organization of Asian and Western economic systems—the former being characterized as “network” or “alliance” capitalism and the latter as “market” capitalism. In Chapter 18, Nicole Biggart and Gary Hamilton argue that the network organization of Asian economies—and their remarkable success—cannot be understood easily from the perspective of neoclassical economics. From the neoclassical point of view, the dense relations that link the institutions in these economies into a network would be seen merely as imperfections that would impede their efficiency, instead of properly being seen as ties that bind and give these economies their particular character and economic vitality. Biggart and Hamilton therefore advocate abandoning the neoclassical perspective in favor of a network perspective, not because the former is wrong, but because it is ethnocentric and applies well only to the Western economies on the basis of which it was constructed. Moreover, they show how a network perspective yields much sharper insights into the emergence and success of the Asian economies.

In Chapter 19, Michael Gerlach and James Lincoln describe an ambitious research project they are conducting that attempts to document the organizational differences between the Japanese and U.S. economies. They argue that networks among financial, commercial, and industrial firms in an economy determine significant features of that economy's overall organization and its resulting performance. They go on to offer a series of propositions regarding differences in the structure of the U.S. and Japanese economies, differences in the strategic behavior of U.S. and Japanese firms, and—given these differences—how the network position of firms in the United States and Japan would influence their performance. Though Gerlach and Lincoln do not provide any empirical evidence to support their propositions, they clearly show how network theories and methods can provide “powerful tools in advancing our understanding of such network economies and their competitive advantages relative to the United States.”

In the concluding chapter of this book, Rosabeth Moss Kanter and Robert G. Eccles discuss how network research can be made more relevant to practitioners. Their main conclusion is that even though there

are important lessons for managers in each of the papers in this book, the papers have been written in a manner that most managers would not find easy or compelling to read. In order to make the important contributions that research on networks and organizations has to offer more accessible and useful to practitioners, they suggest that future research in this area must recognize that managers are more interested in how networks can be created and used than in understanding the characteristics, properties, and consequences of networks. To advance this more active stance toward networks, they highlight several key issues that academics must take into account in conducting their research. The agenda outlined by Kanter and Eccles is a challenging one and holds great promise for bridging the gap between theory and practice.

We believe that the papers in this volume, though not directly written for practitioners, make important contributions in each of the areas Kanter and Eccles outline. Clearly, more needs to be done to make this research more relevant and accessible to practitioners.

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Is a Network Perspective a Useful Way of Studying Organizations?

NITIN NOHRIA

The term “network” has become the vogue in describing contemporary organizations. From large multinationals to small entrepreneurial firms, from manufacturing to service firms, from emerging industries such as biotechnology to traditional industries such as automobiles, from regional districts such as Silicon Valley and Italy’s Prato district to national economies such as those of Japan and Korea, more and more organizations are being described as networks.¹ Typically, the term “network” is used to describe the observed pattern of organization. But just as often it is used normatively: to advocate what organizations must become if they are to be competitive in today’s business environment.

The concept of networking has also become a popular theme at the individual level of analysis: Individuals are alerted to the importance of their so-called “connections” in getting things done or moving ahead in life and are therefore urged to network more—to build relationships that they can use to their advantage.² A growing number of networking organizations that help people make all sorts of contacts—from finding dates to finding a venture partner—have sprung up to capitalize on the interest in networks. Many firms (aided by willing consultants) have also joined the bandwagon, offering in-house training programs that help their employees learn about the importance of networks and how to go about building and using them.³

What accounts for this enormous contemporary interest in networks? After all, the idea itself is not new. At least since the 1950s, the concept of networks has occupied a prominent place in such diverse fields as anthropology, psychology, sociology, mental health, and molecular biology. In the field of organizational behavior, the concept dates back even further. As early as the 1930s, Roethlisberger and Dickson (1939) described and emphasized the importance of informal networks of relations in organizations.