

key constructs in the context of interorganizational networks. *Managing Network Resources* offers guidance that can promote such a fruitful endeavor. It uncovers an exciting domain in the network literature, which has already begun to gain traction through emerging empirical research, such as Lee's (2007) work on the role of network resources in facilitating product market entry in the communication industry, or my work on the role of network resources in value creation and appropriation in the software industry (Lavie, 2007). In view of the maturing literature on the structural properties of interorganizational networks, the emerging research on network resources is expected to revive and retain interest in network perspectives. In particular, network resources may just be the missing piece in the unresolved puzzle of why we have convincing theories about the benefits of alliances but lack solid evidence on the linkage between alliance networks and corporate performance. Many of the recent studies that demonstrate performance implications of alliance networks at the firm level adopt the network resources framework.

Moreover, given the highly relevant questions that motivate it, *Managing Network Resources* offers immediate managerial implications. Practitioners still debate about the choice of partners and the consequences of partnering decisions. The book urges managers to nurture interorganizational relationships not merely as a source of market information and referrals to prospective partners or business opportunities but as a generic vehicle for accessing a variety of intangible and tangible assets. Furthermore, managers should look beyond resource flows and realize the long-term performance implications of interorganizational networks.

Although I was already quite familiar with Gulati's research, I benefited greatly from having the opportunity to reflect on his collective research stream following this new roadmap. From such a standpoint, *Managing Network Resources* offers much more than a collection of influential articles. It promotes a new social network perspective, backed by conclusive evidence.

## REFERENCES

- Dyer, J. H., & Singh, H. 1998. The relational view: Cooperative strategies and sources of interorganizational competi-

tive advantage. *Academy of Management Review*, 23: 660–679.

Granovetter, M. 1985. Economic action and social structure: The problem of embeddedness. *American Journal of Sociology*, 91: 481–510.

Gulati, R. 1999. Network location and learning: The influence of network resources and firm capabilities on alliance formation. *Strategic Management Journal*, 20: 397–420.

Kale, P., Singh, H., & Perlmutter, H. 2000. Learning and protection of proprietary assets in strategic alliances: Building relational capital. *Strategic Management Journal*, 21: 217–237.

Kogut, B. 2000. The network as knowledge: Generative rules and the emergence of structure. *Strategic Management Journal*, 21: 405–425.

Lavie, D. 2006. The competitive advantage of interconnected firms: An extension of the resource-based view. *Academy of Management Review*, 31: 638–658.

Lavie, D. 2007. Alliance portfolios and firm performance: A study of value creation and appropriation in the U.S. software industry. *Strategic Management Journal*, 28: 1187–1212.

Lee, G. K. 2007. The significance of network resources in the race to enter emerging product markets: The convergence of telephony communications and computer networking, 1989–2001. *Strategic Management Journal*, 28: 17–37.

Portes, A. 1998. Social capital: Its origins and applications in modern sociology. *Annual Review of Sociology*, 24: 1–24.

Rothaermel, F. T. 2001. Incumbent's advantage through exploiting complementary assets via interfirm cooperation. *Strategic Management Journal*, 22: 687–699.

Saxton, T. 1997. The effects of partner and relationship characteristics on alliance outcomes. *Academy of Management Journal*, 40: 443–461.

Stuart, T. E. 2000. Interorganizational alliances and the performance of firms: A study of growth and innovation rates in a high-technology industry. *Strategic Management Journal*, 21: 719–811.

Stuart, T. E., Hoang, H., & Hybels, R. 1999. Interorganizational endorsements and the performance of entrepreneurial ventures. *Administrative Science Quarterly*, 44: 315–349.

**Technology Perspective on Network Resources**,  
by Riitta Katila, Stanford University,  
Stanford, CA

During the past decade, interorganizational relationships have become one of the central topics of research on organizations. Ranjay Gulati's new book, *Managing Network Resources*, is an important overview of this now relatively mature but vibrant research area. A central theme of the book is that the behavior and performance of firms can be more fully understood

by examining the network of relationships in which the firms are embedded. In particular, the book highlights *network resources* as a central concept in helping us better organize our thinking about networks and how networks influence firms and their behavior.

### KEY THEMES AND CONTRIBUTIONS

*Managing Network Resources* provides an overview of Professor Gulati's research program and processes of thought during the past fifteen years and, in so doing, provides a highly thoughtful and sophisticated review of a range of topics related to interorganizational relationships and networks. The book begins with his early work as a doctoral student at Harvard and continues with papers written with several colleagues and students at Northwestern and elsewhere and published in a wide range of journals, from *American Journal of Sociology* and *Administrative Science Quarterly* to *Academy of Management Journal* and *California Management Review*.

Both the depth and the breadth of Gulati's scholarship are truly remarkable. While a large number of studies have examined alliances and networks, examples of books that systematically review the chronological life cycle of relationships from preformation assessment to managing the collaboration are rare. Gulati's book is able to do just that; it provides a comprehensive understanding of the life cycle of relationships and useful taxonomies to organize thinking (such as those on types of ties introduced in Chapter 6, based on work with Harbir Singh; Gulati & Singh, 1998), combined with several deep dives into specific areas of interest (e.g., choice of partners, board interlocks, environmental contingencies).

Gulati's work on interorganizational relationships, which the book integrates and from which it draws, has also been highly influential. Scholars in a broad range of disciplines have built on Gulati's original contributions, as evidenced by his frequent lead on the lists of the most cited authors in the management and business literature. For instance, Science Watch ranked Gulati as one of the Most Cited Authors in Economics and Business from 1995 to 2005. A book that integrates this influential work is timely and welcome.

### INTERORGANIZATIONAL RELATIONSHIPS AND TECHNOLOGY

Advances in understanding interorganizational relationships centrally impact not only organizational theory, sociology, and entrepreneurship but also research on technology strategy. In fact, a recent survey of the annual meeting submissions to the Academy of Management's Technology and Innovation Management Division indicated that one of the most frequently cited topic areas in papers was interorganizational relationships (Schoonhoven, 2007). The purpose of my review is to highlight those aspects of *Managing Network Resources* that relate to key questions in technology and innovation. This approach is also particularly appropriate since Gulati's empirical evidence on network resources originates in a range of technology-intensive industries, from new materials and industrial automation to biopharmaceuticals and automotive product sectors, and, thus, is particularly likely to provide new theoretical insights that are relevant for technology scholars.

By using a technology lens, I address four core themes in Gulati's work that are likely to spark lively discussion among technology strategists: (1) resources, (2) timing, (3) competition, and (4) market uncertainty. Access to resources is a necessary condition for successful development and commercialization of technologies (Katila & Shane, 2005), successful innovators carefully time their competitive moves (Mitchell, 1989) and avoid the negative effects of competition and leverage on the positive aspects (Katila & Chen, 2006), and technology-intensive firms are typically at the forefront of creating new markets and so need to manage the related market and technological uncertainties (Eisenhardt & Schoonhoven, 1996).

The first technology-related theme that *Managing Network Resources* highlights is *resources*. In particular, the idea is that networks provide access to resources, markets, and technologies that may not be available to the focal firm but may be accessible through its network partners. Such access (and, perhaps even more important, the ability to leverage partner resources) is particularly important for technology-intensive firms that often need timely access to a significant set of resources (Katila & Mang, 2003; Mitchell, 1989). Gulati emphasizes (espe-

cially in Chapters 1 and 11) that network resources—that is, those resources that are available from partners and accessible through ties that a firm enters with them—can be key sources of technological expertise, operational resources, and even key technologies that remain otherwise unavailable to the focal firm. In related work, Gautam Ahuja and I (Katila & Ahuja, 2002) have further shown that external resources that often originate in networks (exploration), when balanced with the firm's own core technological resources (exploitation), are likely to be the key components of balance that leads to breakthrough products. Overall, the idea of network resources is particularly intriguing for technology strategists, and the book acknowledges that scholars are only taking the first steps in developing this emerging but potentially highly influential concept.

The second key element of interest is *timing*. Chapters 2 and 3 bring up the notion that timing matters in relationships. The right timing, as well as finding partners that are simultaneously willing to form alliances, is a significant task for alliance management. Again, Gulati's work is illuminating for technology scholars, because in fast-paced technology industries in particular, a firm that seeks partners must approach them at the right time and preempt them from seeking alliances elsewhere (Eisenhardt & Schoonhoven, 1996; Utterback, 1994). On the flip side, Gulati's work also suggests that the firm must time its collaboration efforts at a time when its technology is protected from potentially misaligned interests of partners to avoid the two-way flow through ties (cf. Ahuja, 2000). Recent research further suggests that later timing is likely to make it more difficult for a partner to appropriate intellectual property; biotechnology firms use this reasoning when they delay R&D collaborations with unfamiliar partners (Katila & Mang, 2003). Another interesting question on the right timing is related to sequences and the rhythm of alliance formation. My recent work with Eric Chen shows that successful innovators time their R&D activities so that they work on key technologies earlier or later than their key competitors but avoid being in lock step (Katila & Chen, 2006). However, we still know very little about sequences and rhythm related to technology alliances. The right rhythm of alliance formation is, of course, only one of the promising

areas for future work suggested by Gulati's contributions on this topic.

The third theme in the book that has attracted increasing attention among technology scholars is *competition*. The idea that firms do not innovate in isolation highlights both the benefits of co-opting competing firms to collaborate on a common goal and the potential dark side of competition. *Managing Network Resources* considers both of these roles of network resources—that is, it examines networks as both pipes and prisons. The first role (pipes) highlights the benefits of partnering with technologically related and relevant partners and the advantages provided by joint development of technologies and standards. The second role (prisons) highlights the negative side of these relationships with competitors that may lock firms into unproductive relationships or preclude partnering with other viable firms (see also Gulati, Nohria, & Zaheer, 2000). Chapters 5, 6, and 7 in the book (the latter two based on joint work with Harbir Singh and Lihua Wang, respectively) present these two-sided effects of partnering with competitors: the benefits of enlarging the pie and creating more knowledge, the potential risks of appropriation, and the role of trust and governance mechanisms in mitigating the negative effects. Overall, the specific effects of competition on technology alliances and networks have been relatively unexplored and again suggest intriguing avenues for future research.

The fourth technology-related theme that *Managing Network Resources* highlights is *uncertainty in emerging markets*. In Chapters 9 and 10 (based on joint work with Monica Higgins), Gulati takes the entrepreneur's perspective on relationship formation. The key idea is that network resources can alleviate the factors that often suppress technology development in uncertain or emerging markets (cf. Anderson & Tushman, 2001). Recent research agrees with Gulati's notion that network resources can minimize the search costs for new technologies, limit the costs of coordinating with other firms, serve as signals of quality, and lower the unpredictability and risks of hazardous behavior by alliance partners (e.g., Baum, Calabrese, & Silverman, 2000; Powell, Koput, & Smith-Doerr, 1996). The book points out that such risks are especially acute in science-based industries where development times are long and technology development uncertain. These two chapters

also further develop several interesting contingencies of network resources that depend on the environmental conditions the entrepreneurs are facing.

### CONCLUSION

The topics discussed in *Managing Network Resources* influence research in several disciplines. By examining both antecedents and consequences of interorganizational relationships, Gulati is able to identify relevant and intriguing research questions and make substantial contributions to theory on networks. His style of weaving together insights that are well grounded in empirical phenomena with theoretical contributions and patterns makes for an interesting read. The book also brings conceptual clarity to some of the key concepts in the literature, such as network resources, and considers their implications for firm strategy. To top the list, the questions that Professor Gulati asks are managerially relevant and timely.

I recommend this book highly for anyone interested in interorganizational relationships, particularly doctoral students and scholars who are looking for a concise and engaging overview of the state of the relationship literature. The book also usefully identifies where the significant opportunities are for future work on networks and network resources, thus opening up exciting avenues of interorganizational relationships for young scholars. In particular, differential effects of network effects across industries, the effects of competition and timing, and questions related to young firms that are just beginning to build their network positions provide intriguing paths for future work.

### REFERENCES

- Ahuja, G. 2000. Collaboration networks, structural holes, and innovation: A longitudinal study. *Administrative Science Quarterly*, 45: 425–455.
- Anderson, P., & Tushman, M. 2001. Organizational environments and industry exit: The effects of uncertainty, munificence and complexity. *Industrial and Corporate Change*, 10: 675–711.
- Baum, J., Calabrese, T., & Silverman, B. 2000. Don't go it alone: Alliance networks and startups' performance in Canadian biotechnology, 1991–97. *Strategic Management Journal*, 21: 267–295.
- Eisenhardt, K., & Schoonhoven, C. 1996 Resource-based view of strategic alliance formation: Strategic and social effects in entrepreneurial firms. *Organization Science*, 7: 136–150.
- Gulati, R., Nohria, N., & Zaheer, A. 2000. Strategic networks. *Strategic Management Journal*, 3: 203–215.
- Gulati, R., & Singh, H. 1998. The architecture of cooperation: Managing coordination costs and appropriation concerns in strategic alliances. *Administrative Science Quarterly*, 43: 781–814.
- Katila, R., & Ahuja, G. 2002. Something old, something new: A longitudinal study of search behavior and new product introductions. *Academy of Management Journal*, 45: 1183–1194.
- Katila, R., & Chen, E. 2006. Never too early, never too late: Effects of search timing on product innovation. *Academy of Management Best Paper Proceedings*, OMT: O1–O6.
- Katila, R., & Mang, P. 2003. Exploiting technological opportunities: The timing of collaborations. *Research Policy*, 32: 317–332.
- Katila, R., & Shane, S. 2005. When does lack of resources make new firms innovative? *Academy of Management Journal*, 48: 814–829.
- Mitchell, W. 1989. Whether and when? Probability and timing of incumbents' entry into emerging industrial subfields. *Administrative Science Quarterly*, 34: 208–230.
- Powell, W., Koput, K., & Smith-Doerr, L. 1996. Interorganizational collaboration and the locus of innovation: Networks of learning in biotechnology. *Administrative Science Quarterly*, 41: 116–145.
- Schoonhoven, C. 2007. *The role of theory in technology and innovation management scholarship*. Distinguished speaker presentation at the annual meeting of the Academy of Management, Philadelphia.
- Utterback, J. 1994. *Mastering the dynamics of innovation*. Cambridge, MA: Harvard University Press.

### The Resource Characteristics of Strategic Alliances, by James Westphal, University of Michigan, Ann Arbor

*Managing Network Resources* is an insightful and thought-provoking synthesis of Ranjay Gulati's research on strategic alliances. Gulati's research was seminal in developing a social network perspective on alliances and interorganizational cooperation. More generally, the stream of research summarized in this book represents perhaps the most fully developed sociological perspective on corporate strategy to date. Some of the material here will be familiar to corporate strategy scholars, but the book ultimately makes a valuable contribution to the strategy literature by highlighting work that has received less attention from strategy scholars while integrating Gulati's most important works



Copyright of *Academy of Management Review* is the property of *Academy of Management* and its content may not be copied or emailed to multiple sites or posted to a listserv without the copyright holder's express written permission. However, users may print, download, or email articles for individual use.