

Strategic Management of Innovation Networks

Suitable for a one- or two-semester course for undergraduate and graduate students, this interdisciplinary textbook explains the diverse aspects of innovation and social networks, which occupy a central place in business and policy agendas. Its unified approach presents networks as nested systems that can span organisations, industries, regions and markets, giving students a holistic perspective and reducing the amount of effort required to learn the theoretical framework for each layer. With engaging real-world examples, the text also provides a practical guide on how to manage networks to increase innovation performance. Topics covered include forming teams to foster creativity, selecting partners and leveraging partnerships for learning, managing organisational change, and sponsoring technologies in communities. Students will learn the metrics used in social network analysis and how they are interpreted and applied. Suggested reading lists and online resources offer opportunities for further review and practice.

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To the memory of my beloved father, Prof. Dr. Aydođan Özman.

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Preface

The cover illustration of this book shows a detail from a piece of indigenous Australian art. Traditionally, Aboriginal artists used a variety of symbols in their paintings, many of which represent natural features, like water flows, hills or rock holes. These paintings were sometimes used as maps, giving travellers information about the landscape. In a way, networks in the modern economy are similar to these works of art, in the sense that they show the distribution of resources and power, the organisation of work or the flow of knowledge between actors. Networks give a bird's-eye view of different industrial or organisational landscapes.

Networks are important to innovation because innovation is a social and collective process that involves a wide range of actors and the interactions between them. This importance is reflected in the contemporary literature on networks and innovation, where research crosses disciplinary boundaries, bringing insights from sociology, economics, management, organisation theory, physics, geography and psychology. This makes for a rich variety of inputs but it also represents a challenge in finding a common language to bridge them. The aim of this book is to provide that bridge and to improve our understanding of how networks function inside and outside organisations, their implications for different aspects of the innovation process, and how they form and evolve. This book has a wide, cross-disciplinary scope supported by suggestions for further reading for those who want to explore any of the topics more extensively.

While the literature on innovation networks has grown steadily over the last three decades, the implications of this research for managing innovation have been less visible. This is surprising, given the many ways in which a good understanding of networks can help manage innovation, for example by fostering creativity, leveraging partnerships for learning, selecting partners, managing organisational change, sponsoring technologies or novelties in the market, and managing supplier relations.

The management of innovation networks benefits an organisation in two ways. First, it enables informed interventions in networks – like partner selection and team formation – that help an organisation obtain a strategically privileged position in accessing critical resources and capabilities for innovation. Second, and more indirectly, understanding the networks within and surrounding organisations helps to improve the effectiveness of many aspects of innovation management. For example, understanding the distribution of knowledge inside a firm can be highly relevant; social network analysis techniques can be used to map the nature of the knowledge base.

This book has been written for graduate or advanced undergraduate students, practitioners and researchers in the fields of social networks and innovation. It is a practical, action-oriented guide to managing the innovation process through a network perspective, based on important theoretical results. It provides a comprehensive view of networks and demonstrates how the concepts and techniques of the social network perspective work in practice. It also reviews new insights in emerging fields, explores major debates and provides succinct but comprehensive coverage of diverse topics in the field.

In this book I take an evolutionary approach to two sides of the innovation process: search and selection. Search activities are related to generating innovation, while selection processes are related to promoting and diffusing novelties. During search, networks help to recognise opportunities, create, learn, explore and ultimately generate innovations in a system. With selection, networks affect the way people influence others and are influenced by them, choose between alternatives or provide insights in sponsoring novel projects.

The first part of the book is introductory, with each chapter dedicated to one aspect of an innovation network. Chapter 1 explains the meaning of innovation networks and introduces the innovation network box, which is composed of three dimensions: the purpose of network management, the type of networks that fit the purpose and what social network metrics to apply (Figure 0.1). Chapter 2 explores the nature of innovation and why a network approach is relevant to understanding and managing it. The search and selection processes are explained in detail in this chapter. In Chapter 3 I introduce networks as nested systems, composed of teams, departments, business units, firms and industries, in increasing order of aggregation. I also distinguish between different network levels, for example, inter-organisational, intra-organisational and market. Chapter 4 looks at the types of data and social network analysis techniques used to analyse innovation

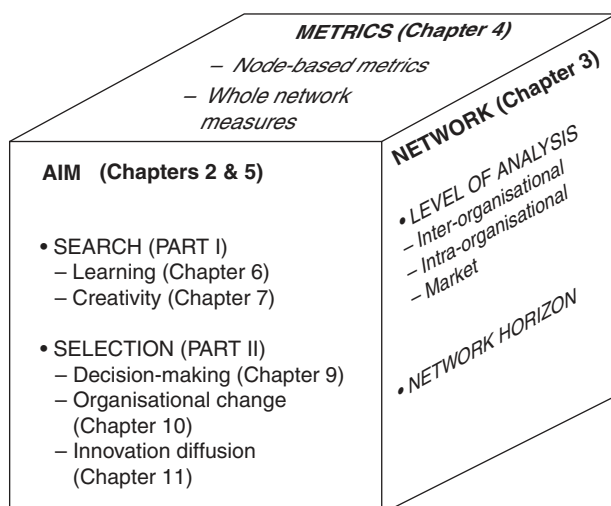


Figure 0.1 Innovation Network Box and the Planning of the Book

networks for different purposes and explores major debates in social network theories. In Chapter 5 I investigate the scope, aims and benefits of network management and introduce a practical guide for managing innovation networks, including critical parameters.

Part II explores the role of networks in search activities. In Chapter 6, I explain how the exploration and exploitation dimensions of organisational learning are related to alliances, alliance portfolios and networks. Chapter 7 focuses on creativity and networks. I look at creativity as both an individual attribute and a social process in which the functioning of teams, and the structure of the broader network, are significant. Chapter 8 examines the role of modularity, an important aspect of new product development that has implications for the effective management of relations between teams and between firms. In this chapter, I also look at the role of networks in user innovation.

Part III explores the role of networks in selection. In Chapter 9 I examine how networks act as signals when selecting among different innovation projects (venture capital decisions or building coalition and obtaining support and resources in intrapreneurial activities). In this chapter, I also review cognitive biases that may be rooted in networks and influence managerial decision-making. Chapter 10 focuses on how the social network approach helps in change management. What does the structure of an organisation's informal networks reveal about possible resistance to change? What will

post-change networks look like? Who are the most likely influentials who will help build coalition? Chapter 11 explores the classic literature on social networks and diffusion and more recent approaches. How do ideas and innovations spread on online social media? Who are the influential people, and how do we find them? What does the structure of social network platforms reveal about the patterns of influence and diffusion between people?

The fourth and final part of the book explores the hinterland of network evolution. Chapter 12 is concerned with the antecedents of tie formation and dissolution within inter-personal and inter-organisational networks. I explore mechanisms like the role of individual attributes (experience, knowledge, personality), dyadic attributes (similarity, proximity, etc.) and past networks. Building on the insights developed in Chapter 12, Chapter 13 explores network evolution. Some structural regularities in real-world networks are explained, as well as the factors that drive their emergence and evolution, including important events, firms' strategies, institutional, technological and market-related factors and the interrelations between them.

Finally it is important to mention that the network approach in innovation is a relatively young field, yet it is growing fast. While in just one or two decades much work has been done in terms of research, there is still much to be done in the future, not only in terms of research, but also to translate theoretical findings into action-oriented guides. I hope that this book serves as a useful source in this sense.

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