Network Analysis and Tourism
From Theory to Practice

Noel Scott, Rodolfo Baggio and Chris Cooper

Contents

Contributors *

Noel Scott has extensive experience as a senior tourism manager and researcher and over 25 years in industry research positions. He holds a doctorate in tourism management and Masters degrees in marketing and business administration and is a senior lecturer at The University of Queensland, Brisbane, Australia.

Chris Cooper has degrees in geography from University College London. He is joint editor of Channel View's Aspect of Tourism Series and co-editor of Current Issues in Tourism. His research interests lie in the area of destination management, particularly focusing on network analysis and innovation. He is currently director of the Christel DeHaan Tourism and Travel Research Institute at the University of Nottingham, UK.

Rodolfo Baggio has a background in physics and actively researches and lectures in the field of information technology and tourism. He is now applying quantitative network analysis methods to the study of tourism destinations.

*   *   *   *   *   *

Zélia Breda is a lecturer and PhD student in tourism at the University of Aveiro. She holds an MA in Chinese Studies and a degree in tourism management and planning from the University of Aveiro. Her research interests include tourism development and planning, clusters and networks, tourism in Asia, international investment, tourism politics and economics. She is author and co-author of national and international publications, and has participated in various international conferences.

*Authors of individual chapters are indicated at the head of the chapters concerned. All other material has been written by the three principal authors.

Carlos Costa has been Director of the Portuguese teaching programmes of the Aveiro University since 1996 and is a visiting senior fellow at the University of Surrey. He holds a PhD and MSc in tourism management from the University of Surrey. He is also Editor of the Tourism & Development Journal, the first tourism journal in Portugal. Carlos has also been involved in several projects and consultancy work for the Portuguese Government and other Portuguese organisations.

Rui Costa is a tourism PhD research student at the University of Aveiro and research fellow of the Foundation for Science and Technology. He holds an MSc in innovation and development policies and a degree in tourism management and planning from the University of Aveiro. His research interests include tourism planning and development, tourism networks, innovation and entrepreneurship, project evaluation and monitoring.

Dianne Dredge's main areas of interest are in policy networks, and their structure and role in tourism planning and development. She also has active research interests in social constructions of tourism places, networks and development conflicts, tourism governance and inter-governmental relations. She is an active member of the planning profession and is involved in a range of tourism planning consultancies. She is an Associate Professor at the Centre for Tourism, Sport and Service Innovation, Griffith University, Australia.

Roger March's research interests include international tourism, marketing in Asia and distribution channels and systems in relation to tourism service provision. He does consulting work on Japanese and Asian tourism markets for Australia's leading tourism organisations and works as cross-cultural trainer of Westerners working in Japan or in Japanese companies overseas. Roger is a Senior Lecturer at the School of Marketing, University of New South Wales.

Giuseppe Marzano holds a doctorate in tourism from The University of Queensland where he lectures in tourism management. His research currently focuses on stakeholder interactions in decision-making processes in the context of tourism with a particular emphasis on collaboration and power issues.

Joana Miguéns is a tourism PhD research student at the University of Aveiro. She holds an MSc in software systems from the University of Aalborg

and a degree in applied mathematics from the Technical University of Lisbon. Her main field of research is tourism network analysis and the study of strategic positioning with a multi-disciplinary approach. She has been involved in cross-group research (at both national and international levels), has participated in several conferences, and is author and co-author of international publications.

Grace Wen Pan is head of travel and leisure research at ACNielson China and an adjunct professor in the department of travel, leisure, sport and hotel management at Griffith University, Australia. She has been actively involved in China's outbound travel research for nearly ten years, and has conducted a number of research projects. She received her Bachelor's degree in Economics from Shanghai International Studies University, Master of Business (Research) from Queensland University of Technology, and Doctor of Philosophy in tourism markets from Griffith University, Australia.

Kathryn Pavlovich's research places collaboration at the core of inquiry. These studies include a ten-year ethnographic inquiry into network transformation, regional development through partnerships, and more recently a study on the role of intuitive knowledge in decision-making. Kathryn is an Associate Professor at the Waikato Management School, University of Waikato, New Zealand.

Christof Pforr's main research interests include tourism policy and planning, sustainable (tourism) development, coastal tourism, geotourism and ecotourism as well as policy analysis with a focus on policy processes and policy networks. Christof is a Senior Lecturer at the School of Management, Curtin Business School, Curtin University of Technology, Western Australia.

Ian Wilkinson's current work focuses on the development and management of inter-firm relations and networks in domestic and international business and the dynamics of markets and industrial networks, including an interest in complexity. Ian is a Professor at the School of Marketing, University of New South Wales.

Chapter 1
Introduction

We live in a networked world. The concept of a network of friends, of businesses or indeed of computers is pervasive in our conversations, newspaper articles or business plans. For many, the increasing importance of innovation and adaptation to turbulent environments is changing the nature of interaction with other organisations and as a response we increasingly encounter more networked inter-organisational relationships such as alliances, partnerships, clusters and communities of practice. These organisational forms often involve interaction between numerous individual organisations such that the flows of information and resources between them are complex. As a result these networks of organisations are becoming a dominant organisational form in the 21st century (Cravens & Piercy, 1994).

For many business sectors, the development of networks of organisations may be new or novel. For example, 'Just In Time' manufacture, which requires a network of suppliers working together, has been in place since the early 1980s (Huson & Nanda, 1995). In comparison, tourism has always been a networked industry and the usual description of tourism as a fragmented and geographically dispersed industry belies a pervasive set of business and personal relationships between companies and managers in businesses such as national tourism offices, hotels, attractions, transport, tours, travel agents and restaurants. It is this network of relationships that allows the tourism industry to deliver its product and to overcome the problems of fragmentation. Therefore it can be argued that the tourism industry provides the ideal context for study of networks.

The network concept is based around relationships between entities such as organisations or people (termed nodes), and the properties of networks studied by researchers relate to the structure of these relationships. The study of networks may be considered to have a number of paradigmatic characteristics (Wellman, 1988: 82) focusing on:

- Structural advantages and constraints on behaviour.
- The discovery of groups through their relationships rather than a priori allocation to categories.

- The overall structure of multiple relationships in a group rather than that between a particular pair of alters (in the language of network analysis, a particular node is identified as 'ego' and those nodes that ego has relationships with are termed 'alters').

One consequence of this approach is that it makes problematic the classical economic concept of a market as a homogeneous collection of identical suppliers and buyers. Instead, studying networks presupposes that the individuals do not act in isolation and with perfect information, but that the behaviour of individuals is profoundly affected by the pattern of relations that they may (proactively) develop. In studying networks the focus therefore is on relations rather than attributes, and on structured patterns of interaction rather than isolated individual actors. A second implication is that the fundamental basis for the study of networks is different from other areas which study the attributes of people or organisations. Instead, network analysis studies relationships (Knoke & Kuklinski, 1991).

Definition of a Network and Network Analysis

Originally, the concept of a network was a metaphor for the complex interactions between people in the community. However, with the development of quantitative approaches the concept of a network became formalised and related to mathematical theory. In graph theory a network is a:

> finite set of points linked, or partly linked, by a set of lines (called arcs) … called a *net*, there being no restriction on the number of lines linking any pair of points or on the direction of those lines. A *relation* is a restricted sort of net in which there can only be one line linking one point to another in the same direction, i.e. there are no parallel arcs. (Mitchell, 1969: 2–3)

Transferred into sociology, a network is defined as a specific type of relation (ties) linking defined sets of persons, objects or events (Mitchell, 1969), and the sets of persons, objects or events on which a network is defined are called actors or nodes. Thus a network consists of a set of nodes, and ties representing some relationship between the nodes. Today, there are many definitions of a network but as pointed out by Jarillo (1988: 31), many have been developed by applying this basic definition to new areas such as the study of organisations where, for example, Gamm (1981) defines a network as a system or a field comprised of organisations and inter-organisational relationships.

Given this definition of a network, network analysis (or social network analysis) is an approach and set of techniques used to study the exchange of resources among actors such as individuals, groups, or organisations (Haythornthwaite, 1996). Because of this focus on relationships, the techniques used to analyse networks differ substantially from mainstream statistical methods that demand independent units of analysis. Network analysis therefore uses a set of integrated techniques to draw the patterns of relations among actors and to analyse their structure. The analysis is conducted by collecting relational data and organising it into a matrix and calculating various parameters such as density or centrality.

Network analysis has increased in popularity through the 1990s as an analytical framework, encouraged by the emergence of theories of society that emphasise relationships and integration. This is due in part to the effects of globalisation, which encourages alliances and linkages across organisations and nations, and to the greatly enhanced ease in communications encouraged by the wide diffusion of information technologies. In business and economics, network analysis represents a new organisational paradigm, drawing upon the competencies-based theories of the firm, where relationships shape and constrain organisational performance.

Within the tourism literature, the use of the concept of a network appears logical and delivers a number of useful outcomes for the analysis of tourism destinations and organisations. Tourism is a networked industry where loose clusters of organisations within a destination – as well as networks of cooperative and competitive organisations linking destinations – cooperate and compete in dynamic evolution. The concept of a network and the techniques of network analysis provide a means of conceptualising, visualising and analysing these complex sets of relationships. It provides a method for simplifying and communicating these relationships and so can be useful in promoting effective collaboration within destinations. It allows the identification of critical junctures in destination networks that cross functional, hierarchical or geographic boundaries, so ensuring integration within groups following strategic destination restructuring initiatives.

The aim of this book is to review the contribution of network analysis to the understanding of tourism destinations and organisations. We aim to provide an introduction to the use of quantitative network analysis for tourism and to provide some tourism applications of recent developments in network thinking derived from the physical and mathematical sciences. In working towards the achievement of these aims, we have reviewed the use of network analysis in tourism and found that the

primary approach used to study destination networks is qualitative in nature. In this qualitative approach, the emphasis is on analysis using thick description where network diagrams, if used, are illustrative and display the relationships between pre-identified groups, rather than individual organisations or stakeholders. In comparison, much network analysis research outside tourism adopts quantitative methods where the emphasis is on collecting data concerning relationships between entities. These are mapped using mathematical techniques with results displayed visually in network diagrams and network attributes quantitatively measured.

This qualitative/quantitative divide echoes the qualitative–quantitative debate encountered in tourism and other fields of study (Davies, 2003; Walle, 1997). Outside tourism, this debate may be seen by comparing the inter-organisational network paradigm (Borgatti & Foster, 2003; Podolny & Page, 1998) with the policy network research tradition that emphasises qualitative and ethnographic methods (Rhodes, 2002). In policy network research, the focus is on the dynamic processes of policy-making, implementation and action derived from a view that the important focus for research is the individual. From this perspective, the quantitative approach to network analysis is seen as positivist and ignoring the changing nature of relationships with substantial methodological issues. A more balanced perspective is provided by Dredge (2005) who provides a framework for analysis of tourism policy networks that embeds the dynamic processes of policy-making within a structural network. From this perspective, the quantitative network approach used in this paper provides information on structural properties of the network as a whole that supplements the study of the relationships between individuals. A second differentiating characteristic of the quantitative social network approach is that it does not a priori define groups and structures within the destination. Instead, the aggregate network of relationships between actors in the network is used to define a group, cluster or clique. As Monge (1987: 242) writes, 'groups emerge by being densely connected regions of the network'.

Which is the better approach? Perhaps, when beginning this book, the authors may have been biased towards quantitative network analysis. However, the journey involved in producing a book such as this requires an understanding of the perspectives of many different authors, and it is clear that no single approach to the study of tourism networks can provide all the answers. The book is structured to reflect this debate and is offered to readers for them to choose the best approach, or indeed perhaps to chart a new approach that blends these two approaches together.

We have written the book to provide core ideas of network analysis and tourism, and have invited contributions from several specialists to augment and extend our thinking. As noted above, the qualitative/quantitative categorisation provides the basis for the structure of this book, effectively providing four sections – introductions, qualitative approaches to network analysis, quantitative approaches, and a concluding chapter.

The introductory chapter provides an overview of network analysis for tourism. It is followed by two chapters that provide firstly a history of the network concept in the social sciences and secondly an examination of the use of the network concept in the tourism literature.

The second section of the book reviews qualitative approaches to network analysis and tourism. Chapter 4 by Ian Wilkinson and Roger March provides a managerial application of network research in tourism and an example of how network analysis as a conceptual tool can be used by tourism managers to evaluate the effectiveness of their business-to-business relationships and partnerships. The chapter reports on an Australian Sustainable Tourism Cooperative Research Centre project aimed at developing a best-practice model for the efficient monitoring and organisation of relationships between tourism stakeholders in a regional tourism destination. In Chapter 5, Chris Cooper examines the management of knowledge in tourism destinations from a network perspective. Here knowledge is seen as a resource shared amongst stakeholders whose 'value' is determined in part by its distribution within the destination. The chapter develops a framework for knowledge management in a tourism destination and examines policy implications. Chapter 6 by Dianne Dredge and Christof Pforr examines the development of tourism networks as a new organisational form. The chapter asks if these new networked approaches are more efficient and effective in producing tourism public policy than the more centralised and bureaucratic approaches and if networks promote better tourism governance. In Chapter 7, Kathryn Pavlovich continues the discussion on network governance and network leadership in a case study set within an 'icon' tourism destination in New Zealand, the Waitomo Caves. The chapter examines the evolution of networks in the destination over a period of a hundred years focusing on recent capacity building and the development of knowledge network over recent years. Carlos Costa, Zélia Breda, Rui Costa and Joana Miguéns in Chapter 8 examine whether networks and clusters can be used as an innovative means to support tourism enterprises. They have conducted an empirical study in Portugal, targeting sports and adventure tourism enterprises, mainly consisting of SMEs. They suggest that by cooperating in the form of geographical and product-based clusters, enterprises can function as dynamic and interesting

innovative organisations. In Chapter 9 Grace Wen Pan examines the cross-cultural context of network development. She examines the development of partnering relationships between Australian inbound tour operators and Chinese travel agents in the inbound Chinese travel trade to Australia. The study demonstrates the complexity of network development across cultural boundaries and concludes that the process is embedded with cultural factors, such as guanxi, ethnic preferences and regional cultural differences. In Chapter 10 Giuseppe Marzano examines the process of branding destinations through a network of stakeholders. Here networks are seen not as simple collaborative efforts but also as the vehicle for the exercise of power.

In the third section of this book quantitative approaches to network analysis and tourism are examined. We begin this section in Chapter 11 with a brief overview of formal network concepts and mathematical approaches. This is followed in Chapter 12 by an examination of network visualisation techniques, as one of the important advantages of network analysis is that output can include diagrams which help illustrate structural issues within destination networks. In the next two chapters we apply these quantitative methods to the analysis of tourism destinations. Chapter 13 places network methods within the broader context of complexity and chaos theories and goes on to present the study of two tourism destinations. It is shown how the quantitative approach can help in identifying the main structural characteristics of destination networks and how some of these measurements can be related to issues, such as collaboration and cooperation, which so far have been analysed only by using qualitative techniques. Chapter 14 analyses the technological counterpart of socio-economic systems: the Web space, and proposes the usage of the outcomes of this investigation as indicators to assess both technological and social conditions in a destination. This chapter closes with a consideration of numerical simulation methods. Their usage, it is shown, can prove very effective and useful in analysing special situations, in forecasting future scenarios and in providing destination managers with tools to improve their capabilities of adaptation and reaction to events.

In the final chapter of the book we synthesise the various approaches to network analysis and its application for tourism researchers and provide a discussion of future research opportunities and agendas. The study of tourism networks and the use of formal network analysis techniques have much to offer tourism researchers and we hope that this book will stimulate further development of network thinking. In particular we feel that tourism provides a rich context for research that will allow new theoretical developments of the concept to emerge.

The authors would like to thank a number of people who have helped and supported us in our work, in particular the specialist authors of the chapters in this book – their contribution has considerably enhanced the coverage of network applications to tourism. We are grateful to Dallen Timothy who provided constructive commentary on the manuscript. Noel Scott would like to thank his wife Trisha and family for their support during the last two years and would like to dedicate this book to the memory of his mother Jean Scott who died in February 2007. Rodolfo Baggio wishes to acknowledge Magda Antonioli Corigliano and the colleagues at the Master in Economics and Tourism, Bocconi University for their support and the fruitful discussions, and Valeria Tallinucci and Carla Catastini for the invaluable help in collecting much of the data used for the analyses presented here. Finally, without the patience and the assistance of his family, little of this book would have seen the light. Chris Cooper is grateful to Amy Cooper for putting the final manuscript together and to his two colleague authors – in part this book saw its genesis in fruitful discussions with Rodolfo in Milan and the enthusiastic adoption of the concept with Noel in Australia.