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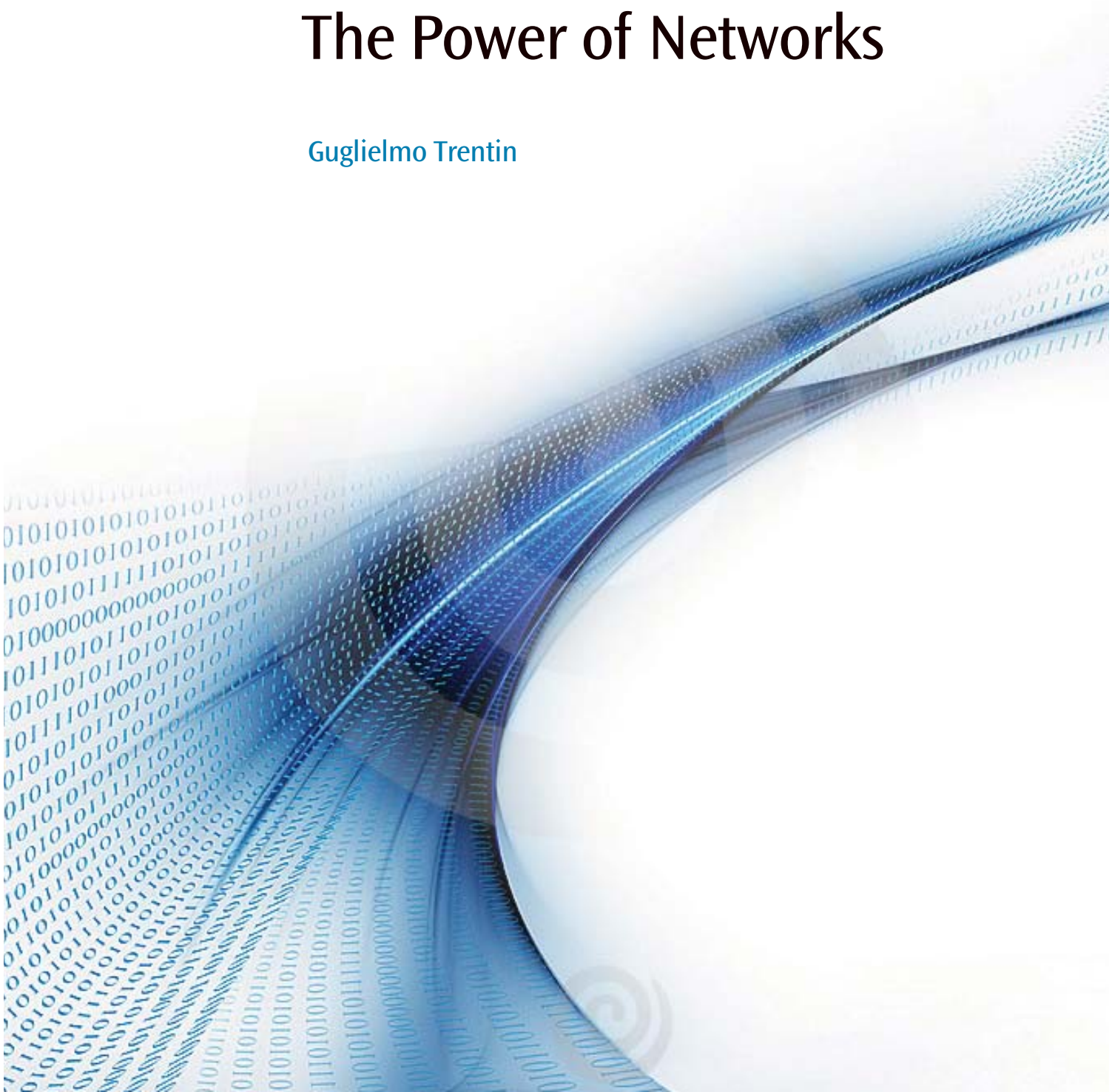
Technology and Knowledge Flows

The Power of Networks

Guglielmo Trentin



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EDITED BY
GUGLIELMO TRENTIN

Oxford Cambridge New Delhi

Chandos Publishing
Hexagon House
Avenue 4
Station Lane
Witney
Oxford OX28 4BN
UK
Tel: +44 (0) 1993 848726
Email: info@chandospublishing.com
www.chandospublishing.com

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Woodhead Publishing Limited
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Acronyms used in the volume

ASLs	Local Health Authorities
CMC	Computer Mediated Communication
CoP	Community of Practice (or Professional)
DKS	Dynamic Knowledge Systems
EMS	electronic meeting systems
E–R	Entity–Relationship diagram
FG	Focus Group
FOI	Swedish Defense Research Centre
HE	Healthcare Ecosystem
HHRS	Home Health Rehabilitation System
HKE	Healthcare Knowledge Ecosystem
ICT	Information and Communication Technology
IF	information flow
IKS	Informational Knowledge Systems
IT	Information Technology
KE	Knowledge Ecosystem
KF	Knowledge Flow
KM	Knowledge Management
KMS	Knowledge Management Systems
KNOWBOT	Knowledge robot
LAN	local area network

LGPL	Lesser General Public License
LOs	Learning Objects
MIO	maritime interdiction operations
NIH	Not-Invented-Here' syndrome
NT	Network Technology
NCP	Networked Community of Professionals
PN	Petri Net
SECI	Socialisation-Externalisation-Combination-Internalisation cycle
TAM	Team Assembly Model
TPB	theory of planned behaviour
WoPeD	Workflow Petri Net Designer

Preface

> Knowledge flows along existing pathways in organizations. If we want to understand how to improve the flow of knowledge, we need to understand those pathways. (Prusak, 2005.)[1]

The early approaches to knowledge management (KM) have focused on knowledge as a thing, because in those days technology focused on codification, but forgot the flow aspects. Now, with social computing, we can also manage flow, although we still need human contact and interaction. Trying to prioritise one form over another is a mistake, but an all-too-common one.[2]

This is a key aspect, and it has provoked the reflections in this book as to how Network Technology (NT) can support, foster and enhance knowledge management, sharing and development processes in professional environments, through the activation of both formal and informal knowledge flows dynamics. Dynamics which are peculiar to a direct formative action (e.g. e-learning) belong to the former type of flow, while NT used to access and share both explicit web knowledge and tacit knowledge stimulated by interactions within online communities belong to the latter type.

Understanding how NT can be made available to such dynamics in the knowledge society is a need that cannot be disregarded, and this need is confirmed by companies' increasing interest in new forms of software-mediated social interaction. Their interest depends on their wishes to speed up both in-house communication and problem-solving processes, and to improve staff knowledge growth.

It is the reason why this book will focus specifically on knowledge flow (KF) processes occurring within networked communities of professionals (NCP) and the associated virtual community tools that foster horizontal dynamics in the management, sharing and development of fresh knowledge. Along this line, a further key issue to be dealt with will be the impact of NT use on both community knowledge flow and NCP performance.

The book is divided into seven chapters, each of which offers a different point of view on how communication technologies (particularly online ones) can support knowledge flow processes.

In Chapter 1, Mark Nissen and Alex Bordetsky argue that knowledge is the key to sustainable competitive advantage, but different kinds of knowledge affect competitive advantage differently, and they exhibit qualitatively different dynamic properties and behaviours. This pertains in particular to tacit and explicit knowledge. The research described in the chapter builds upon Knowledge Flow Theory to conceptualise an approach to accelerating tacit knowledge flows through mobile network technologies, and it illustrates this approach with field research, examining how rich, situated tacit knowledge can be induced to flow rapidly across organisations and distances.

The chapter offers a theoretical contribution and elucidates an exciting path for continued research along these lines. It also highlights practical application, demonstrating how mobile technologies can be leveraged to accelerate tacit knowledge flows.

In Chapter 2, Emil Scarlat, Virginia Maracine and Iulia Maries propose an interpretation of the processes of formation and diffusion of knowledge flows, in networks and knowledge ecosystems, based on the concept of *feedback knowledge*. An example of a knowledge ecosystem is a community of practice that uses collaborative applications to build knowledge in a bottom-up way. The authors' assumption is that flows are generated by the intensity of knowledge accumulated at different points of a network and that they are oriented to the less knowledge-intensive parts of the network by means of a feedback mechanism. In a specific case study, the knowledge dynamics in a healthcare knowledge ecosystem are analysed from the perspectives of knowledge flow attributes, cognitive and innovation features, and increased internal cohesion and cooperation. The role and functions of a knowbot (Knowledge robot) within such a structure are also highlighted.

In Chapter 3, Giuliana Dettori underlines how narrative provides a powerful framework for representing experience and organising knowledge creation. It naturally leads both children and adults to communicate even complex information in a simple way. Hence it is increasingly viewed as a valid learning support in both formal and informal situations, and as an agent of change. The chapter aims to investigate how narrative can help shape knowledge flow within web-based communities, adding an element of concreteness to the interaction and helping members of these communities to exploit the multiple ways of 'acting together' afforded by the current network technologies.

Although both online and onsite dialogic interaction within professional communities are fundamental in KF processes, we should nonetheless be aware of the potential obstacles which may limit their effectiveness. In this regard, in Chapter 4, Vichita Vathanophas and Suphong Chirawattanakij introduce the concept of the 'virtual wall' which blocks knowledge flow in teamwork discussion. Some virtual walls – such as physical appearance and educational background – are evident, but many of them are hidden. The chapter describes a methodological approach for identifying these inhibitive walls. The results of the application of this methodology are consolidated and categorised into four dimensions:

- environment
- format
- process
- people.

In their argumentation, the authors propose the adoption of the Japanese Ba approach to cope with the effects of the virtual walls.

The next two chapters focus on the tools and technologies for graphic knowledge representation and on how these have shown themselves to be particularly effective in fostering KF processes.

In Chapter 5, Giorgio Olimpo shows how graphic representations can facilitate knowledge flows by making tacit knowledge explicit and helping the sharing of explicit knowledge. The graphic representation languages employed in knowledge management (KM) should be reasonably easy to use even for non-specialists. They should also be capable of supporting human communication, which often benefits from the possibility of:

- representing as yet unrefined ideas;
- simplifying complexity, of omitting details;
- hosting different points of view;
- understanding ideas at a glance.

In this chapter, different types of languages and conceptual tools are examined, and their properties are analysed and compared. Special attention is given to their capacity for representing different types of knowledge and for supporting knowledge building processes and interpersonal communication.

After Olimpo's overview of the various languages and tools for knowledge representation, in Chapter 6, Trentin poses the question: when

are these graphic representations useful for professional communities in fostering horizontal knowledge flow in informal learning processes? For this purpose, the author presents and discusses the results of an experiment carried out in the healthcare sector.

In the experiment, the focus was on analysing and discussing their actual usability and effectiveness in fostering collaborative interaction, information exchange and knowledge sharing during a process for studying a specific professional problem.

The book ends with a brief chapter (Chapter 7) which has a twofold purpose: on the one hand, to round off the discussion of the previous chapters with a reflection on the relationship between communication flow and knowledge flow in the light of mediated communication theories; on the other hand, to attempt a summary of the different connotations of knowledge flow in formal and informal learning processes.

I wish to thank all the authors who have contributed with their precious scientific knowledge and experience to the writing of this book, which is addressed to all those who, like us, have the desire to constantly increase our understanding of the best use of technologies currently at our disposal for sharing the huge body of knowledge and professional practices.

Guglielmo Trentin

Notes

1. Larry Prusak in Anklam, P. (2003). KM and the Social Network, *Inside Knowledge Magazine* (www.ikmagazine.com).
2. Snowden, D. (2007). The beginning of the Armadillos. *Cognitive Edge*. Available online: www.cognitive-edge.com/blogs/dave/2007/12/the_beginning_of_the_armadillo.php