USING COMMUNICATION TECHNOLOGY

Also by Bettina S. T. Büchel

INTERNATIONAL JOINT VENTURE MANAGEMENT (with Christiane Prange,
Clemens Rüling and Gilbert Probst)

ORGANIZATIONAL LEARNING: The Competitive Advantage of the Future
(with Gilbert Probst)

Using Communication Technology

Creating Knowledge Organizations

Bettina S. T. Büchel

palgrave

© Bettina Büchel 2001
Softcover reprint of the hardcover 1st edition 2001 978-0-333-92950-6
All rights reserved. No reproduction, copy or transmission of
this publication may be made without written permission.

No paragraph of this publication may be reproduced, copied or
transmitted save with written permission or in accordance with
the provisions of the Copyright, Designs and Patents Act 1988,
or under the terms of any licence permitting limited copying
issued by the Copyright Licensing Agency, 90 Tottenham Court
Road, London W1P 0LP.

Any person who does any unauthorized act in relation to this
publication may be liable to criminal prosecution and civil
claims for damages.

The author has asserted her right to be identified
as the author of this work in accordance with the
Copyright, Designs and Patents Act 1988.

First published 2001 by
PALGRAVE
Houndmills, Basingstoke, Hampshire RG21 6XS and
175 Fifth Avenue, New York, N.Y. 10010
Companies and representatives throughout the world

PALGRAVE is the new global academic imprint of
St. Martin's Press LLC Scholarly and Reference Division and
Palgrave Publishers Ltd (formerly Macmillan Press Ltd).

ISBN 978-1-349-42560-0 ISBN 978-0-333-98567-0 (eBook)

DOI 10.1057/9780333985670

This book is printed on paper suitable for recycling and
made from fully managed and sustained forest sources.

A catalogue record for this book is available
from the British Library.

Library of Congress Cataloging-in-Publication Data
Büchel, Bettina S. T.

Using communication technology : creating knowledge organizations /
Bettina S. T. Büchel.

p. cm.

Includes bibliographical references and index.

1. Information technology. 2. Communication—Technological innovations.
3. Knowledge workers. 4. Organization. I. Title.

HC79.I55 B83 2000

658.4'038—dc21

00-049143

10	9	8	7	6	5	4	3	2	1
10	09	08	07	06	05	04	03	02	01

Contents

<i>List of Tables</i>	vii
<i>List of Figures</i>	ix
<i>Preface</i>	x
<i>Acknowledgements</i>	xi
1 Communication Technology and Organizations	1
Communication technology-induced changes in information processing	1
Communication technology	5
Relationship between communication technology and organizations: theoretical perspectives	8
Multiple levels of analysis	12
2 Knowledge Workers' Choices of Communication Technology	15
Theoretical perspectives on media choice	15
An integrative model of media choice	32
Managerial implications	35
3 Communication Technology and Organizational Design	41
Features of communication technology	41
The organizational design framework from an information- processing perspective	42
Managerial Implications	73
4 Communication Technology and Organizational Learning	81
Organizational learning and information processing	81
Media choice	83
Media choice and organizational learning	87
Knowledge development and communication technology	101
Managerial implications	103
5 Communication Technology and Success	114
The relative nature of success	114
A framework for measuring communication technology success	117

The chain of communication technology measures	132
Managerial implications	134
6 A Dynamic Model of Communication Technology Employment	143
Communication technology as a moderating variable	143
The dynamic model	144
Managerial implications	148
<i>Appendix 1 Assumptions about Organizations</i>	153
<i>Appendix 2 Origins of Information Processing</i>	154
<i>Appendix 3 Interview Results for the Comparative Study of the Impact of Communication Technology on Organizations in Nepal, Thailand and Singapore</i>	156
<i>Appendix 4 A Case Study of Communication Technology Use in Chinese Trademark Agencies</i>	159
<i>Appendix 5 Terminology</i>	162
<i>Notes</i>	163
<i>Bibliography</i>	167
<i>Index</i>	182

List of Tables

1.1	Characteristics of various communication technologies	8
2.1	Key determinants of media choice	16
2.2	Media and their features	17
2.3	Ranking of 'old' and 'new' communication media	18
2.4	Features of 'new' communication technology	19
2.5	Task characteristics and key determinants	20
2.6	A comparison between rational and social theories of media choice	22
2.7	The relationship between recipient availability and richness	26
2.8	Social environment characteristics and key determinants	27
2.9	A medium's characteristics and key determinants	28
2.10	Knowledge worker's characteristics and key determinants	31
3.1	Communication technology and centralization or decentralization	48
3.2	Process gains and losses in group decision-making	64
3.3	Communication technology and influence in decision-making	65
3.4	Managers' criteria for centralization versus decentralization	75
3.5	The potential of group support systems (GSS)	78
4.1	Match between learning processes, learning situation and media choice	97
4.2	Enabling and constraining forces for communication-technology-based-learning	105
5.1	Computer world index – measure of information-technology effectiveness	119
5.2	An example of potential communication technology ratios	120
5.3	Cost–benefit factors	122
5.4	Measure of user satisfaction	128
5.5	Usage measures in communication technology	130
5.6	Impact factors	132
5.7	Conditional communication technology success measures	135
A.2.1	Types of uncertainty	154
A.2.2	Types of ambiguity	154
A.3.1	The impact of communication technology on organizational design dimensions in Nepalese organizations	156
A.3.2	The impact of communication technology on organizational design dimensions in Thai organizations	157

A.3.3	The impact of communication technology on organizational design dimensions in Singaporean organizations	158
A.4.1	Determinants of communication technology usage	159
A.4.2	Companies in the study	160
A.4.3	Hardware and software configuration	160
A.4.4	Networking and database systems implementation	161

List of Figures

1.1	The distinction between ‘old’ and ‘new’ communication media	6
1.2	Hierarchical relationship between terms	7
1.3	Perspectives of communication technology use in organizations	13
2.1	Conceptual model of media choice	32
2.2	Media selection based on media richness evaluation	36
2.3	Task closure scale	37
3.1	Organizational information-processing	42
3.2	Vertical information-processing perspective	44
3.3	Horizontal information-processing perspective	56
3.4	The impact of electronic communication on the exchange of information	59
3.5	Types of decision-making situations	60
3.6	Phases of communication technology penetration	69
3.7	Communication technology transformation of organizations	71
4.1	Organizational learning processes	82
4.2	The trade-off between media richness and media scope	86
4.3	Media choice determinants	87
4.4	Information acquisition and media choice	89
4.5	Information distribution and media high in scope	91
4.6	Information interpretation and rich media	93
4.7	Information storage and media choice	96
4.8	Communication technology potential in knowledge development	112
5.1	Theoretical framework for analyzing communication technology success	118
5.2	Chain of communication technology measures	133
5.3	Types of user involvement in communication technology implementation	137
6.1	The introduction of communication technology	144
6.2	Communication technology choices by knowledge workers	146
6.3	Dynamic model of communication technology and organizations	148

Preface

My interest in the topic originated with the realization that modern communication technologies are having a profound impact on organizational life. Although I previously did not study communication technology in particular, the focus on this topic is less surprising in the light of my overall interest in organizational change. Given the increasing use of communication technologies in organizations, I wanted to investigate the relationship between these modern technologies and their impact on organizations. Even though communication technology can be approached from a number of different disciplines, the theoretical foundation for this book is derived from the information-processing perspective.

With this book, I intend to inform people interested in or working within organizations about the influence of modern communication technologies on organizational life via creating knowledge organizations. The underlying assumption is that with the increasing employment of new communication technologies, organizations are undergoing change – some of which can be predicted, while other changes are a result of the dynamics involved in the organizational context.

Students or academics interested in the influence of new communication technology will probably enjoy reading the first part of each chapter which summarizes the current empirical findings and the underlying theories. Those that would like to determine the outcome of communication technology employment will prefer the second part of each chapter since it focuses on the managerial implications of the findings.

BETTINA S. T. BÜCHEL

Acknowledgements

Writing this book made me realize that with the support of people writing can become an enjoyable task. I particularly benefited from Mrs Yu, a Burmese research associate at the School of Management, Asian Institute of Technology, who helped me in gathering literature, drawing figures and formatting.

I am also grateful for the feedback that I received for earlier drafts of the book, particularly from Raman, a Nepalese doctoral student at the School of Management. He read every chapter several times and looked for inconsistencies and a lack of clarity. With his help, I have tried to simplify the terminology employed throughout the book and included more figures to help the reader making connections between sections.

Without the data gathering of two former MBA students – Ramesh Hamal, a Nepalese, and Cheng Wanxiang, a Chinese – I would not have been able to provide empirical substance to the book. Their work enabled me to draw on the experience of organizations in Asia which serve as examples throughout the book.

During the process of writing this book, I had my second child, Aline. Being pregnant, I had the time needed to focus on writing without being disturbed by other activities that normally accompany a regular faculty job. Since I had my daughter before finishing this book, I feel, however, that she probably suffered most due to the lack of time that I committed to her after she was born. I also wish to thank those people around me who supported me throughout the writing process, especially my husband – Steffen Raub – and my son, Julian.

BETTINA S. T. BÜCHEL