



Series on Innovation and Knowledge Management - Vol. 5

Creating Collaborative Advantage Through Knowledge and Innovation

Editor

Suliman HAWAMDEH

Creating Collaborative Advantage Through
Knowledge and Innovation

Series on Innovation and Knowledge Management

Series Editor: Suliman Hawamdeh
(*University of Oklahoma*)

ISSN: 1793-1533

- Vol. 1 Managing Strategic Enterprise Systems and e-Government Initiatives in Asia: A Casebook
edited by Pan Shan-Ling (*National University of Singapore*)
- Vol. 2 Knowledge Management: Through the Technology Glass
by Meliha Handzic (*University of New South Wales*)
- Vol. 3 Governing and Managing Knowledge in Asia
edited by Thomas Menkhoff (*Singapore Management University*),
Hans-Dieter Evers (*Bonn University*) and Yue Wah Chay (*Nanyang Technological University*)
- Vol. 4 Managing Emerging Technologies and Organizational Transformation in Asia: A Casebook
edited by Pan Shan-Ling (*National University of Singapore*)
- Vol. 5 Creating Collaborative Advantage Through Knowledge and Innovation
edited by Suliman Hawamdeh (*University of Oklahoma*)

Series on Innovation and Knowledge Management - Vol. 5

Creating Collaborative Advantage Through Knowledge and Innovation



Editor

Suliman HAWAMDEH

Oklahoma University, USA

 **World Scientific**

NEW JERSEY • LONDON • SINGAPORE • BEIJING • SHANGHAI • HONG KONG • TAIPEI • CHENNAI

Published by

World Scientific Publishing Co. Pte. Ltd.

5 Toh Tuck Link, Singapore 596224

USA office: 27 Warren Street, Suite 401-402, Hackensack, NJ 07601

UK office: 57 Shelton Street, Covent Garden, London WC2H 9HE

Library of Congress Cataloging-in-Publication Data

International Conference on Knowledge Management (3rd : 2006 : Greenwich
(London, England))

Creating collaborative advantage through knowledge and innovation / edited by
Suliman Hawamdeh.

p. cm. -- (Series on innovation and knowledge management ; vol. 5)

ISBN-13 978-981-270-451-1 -- ISBN-10 981-270-451-5 (alk. paper)

"A selection of papers from the 2006 International Conference on

Knowledge Management held in Greenwich, London"--P. .

Includes bibliographical references and index.

1. Knowledge management--Congresses. 2. Knowledge workers--Social networks--Congresses.

3. Technological innovations--Management--Congresses. I. Al-Hawamdeh, Suliman.

II. Title. III. Series.

HD30.2 .I5566 2006

658.4'038--dc22

200605250

British Library Cataloguing-in-Publication Data

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

Copyright © 2007 by World Scientific Publishing Co. Pte. Ltd.

All rights reserved. This book, or parts thereof, may not be reproduced in any form or by any means, electronic or mechanical, including photocopying, recording or any information storage and retrieval system now known or to be invented, without written permission from the Publisher.

For photocopying of material in this volume, please pay a copying fee through the Copyright Clearance Center, Inc., 222 Rosewood Drive, Danvers, MA 01923, USA. In this case permission to photocopy is not required from the publisher.

Printed in Singapore.

CONTENTS

Acknowledgments		ix
Preface		xi
Chapter 1	The Business Transaction Theory and Moral Hazards for Knowledge Sharing: An Empirical Study <i>Franz Barachini</i>	1
Chapter 2	Knowledge Management Techniques for Know-How Transfer Systems Design: The Case of an Oil Company <i>Djilali Benmahamed and Jean-Louis Ermine</i>	15
Chapter 3	Pursuing the Holy Grail of Knowledge-based Economy Assessment: The Case of Singapore <i>Alton Y.K Chua, Abdus Sattar Chaudhry, and Fong Pin Fen</i>	35
Chapter 4	A Shannon's Theory of Knowledge <i>Benoît Le Blanc and Jean-Louis Ermine</i>	51
Chapter 5	"Working in Parallel": Themes in Knowledge Management and Information Behavior <i>Sue Halbwirth and Michael Olsson</i>	69
Chapter 6	Altruistic Leadership: The Power of Knowledge Creation <i>Maria Sarabia and José M. Sarabia</i>	89

Chapter 7	A Framework for Measuring the Value Creation of Knowledge Management Programs: From the Perspective of Organizational Knowledge Sharing Capability <i>Kaisi Chang and Tony Holden</i>	103
Chapter 8	Social Network Analysis of Four Departments in the National University of Singapore <i>Chu Keong Lee and Jee Foon Wee</i>	119
Chapter 9	Managing Collaborative Network <i>Bruce Cronin</i>	135
Chapter 10	Context-aware and Ontology-driven Knowledge Sharing the P2P Communities <i>Philip O'Brien and Syed Sibte Raza Abidi</i>	155
Chapter 11	Approaching Scientific Knowledge Management from Actions Coordination, Computer-Supported Collaboration, and Concept Mapping <i>Germana M. da Nóbrega, Eduardo J. R. de Castro, Edilson Ferneda, and Gentil J. de Lucena-Filho</i>	175
Chapter 12	Comparative Study Between Hotels and Airlines E-commerce Sites in Singapore <i>Yun-Ke Chang and Miguel Angel Morales Arroyo</i>	191
Chapter 13	Important Competences of Strategists and Decision Makers in the Strategic Knowledge Management Model <i>Roberto Campos Da Rocha Miranda</i>	205
Chapter 14	Managing E-records in North American Colleges and Universities: An Overview of Current Practices <i>Lisl Zach</i>	221

Chapter 15	A Study on Measurement of Intellectual Capital Kernel based on Artificial Neural Network and Empirical Analysis <i>Huang Ningyan and Shuai Ligu</i>	229
Chapter 16	The Compilation of Math Pattern for Productivity in Industrial Organizations based on Organizational Climate <i>Fattah Nazem</i>	247
Chapter 17	From a Property of the Average of Fractions to a Text-processing Interface <i>Guillermo Oyarce</i>	263
Chapter 18	Analyzing Computer Mediated Communication Logs Using a Markov Model <i>Shantanu Pai and Qiping Zhang</i>	279
Chapter 19	Adaptive and Contact-sensitive Information Retrieval <i>Axel-Cyrille Ngonga Ngomo</i>	289
Chapter 20	Can Blogging be Used to Improve Medication Error Collection as Part of Health Informatics Knowledge Management? <i>Deborah E. Swain</i>	301
Chapter 21	Face Work and Credibility on the Web <i>Takashi Nakamura and Hiromi Yuki</i>	315
Chapter 22	The Use of Keyphrases for Selecting Metadata from Taxonomies <i>Rohana K. Rajapakse, Brian Mushens, and Chris Johnson</i>	329
Index		347

This page intentionally left blank

ACKNOWLEDGMENTS

I would like to take this opportunity to thank the Organizing Committee and the International Advisory Board of ICKM2006 for their contributions to the review process and selection of papers. In particular, I would like to thank Martyn Laycock and his team for organizing the event, and preparing an exciting program that kept people engaged, while facilitating an atmosphere to network and build friendships. Special thanks goes to the University of Greenwich Business School for hosting the Third International Conference on Knowledge Management (ICKM2006) on the historic Greenwich Maritime World Heritage Site on the banks of the River Thames London. Matthew Khoe from Greenwich Business School and his team are to be commended for their work on providing technical support and maintaining the website.

The accomplishment of this book relied on the excellent contributions of the authors. I would like to acknowledge with gratitude the insights and valuable contributions provided by the authors. Also, I would like to thank Michelle Farabough for editing the conference papers and coordinating this effort with authors and the publisher, Matthew Broaddus for helping with the paper review process and World Scientific staff for their support in producing the final product.

This page intentionally left blank

PREFACE

The field of knowledge management is relatively new and evolving. What makes it attractive to a wide range of audience is its relevance to today's competitive business environment, as well as its association with disciplines such as information technology, communication, cognitive science, information science, engineering, business, and management. Knowledge management can be viewed as an interdisciplinary subject dealing with various aspects of knowledge processes such as knowledge creation, discovery, capture, sharing, organization, retention, and utilization. Some of these processes are technical in nature and require technical skills that need to come from technical disciplines like information technology, information science, and engineering. Others are considered human centric and require soft skills that need to come from disciplines like communication, cognitive science, business, and management.

The divergence between a practitioner's and an academic's approach to knowledge management is very important to the development and future of the profession. Very often practitioners perceive academics as mostly dealing with basic research and theoretical work that might not have direct applications to real world problems. The ivory tower concept, which is often used to describe academia, symbolizes detachment and it is an indication of someone losing touch with reality and not being able to relate theories to practice. On the other hand, academics might sometimes perceive practitioners' work as being shallow and lacking the theoretical and scientific foundation. Such perceptions could be problematic for emerging disciplines that need to fuse theory with practice. In an emerging field like knowledge management and in the absence of a defined professional qualification, anyone can claim to be an expert in the field. It is important to understand that the role of academia is not only in eliminating illiteracy but also providing graduates with the foundational knowledge and the necessary skills that can gain them entry to their chosen area of practice.

For knowledge management as a discipline to succeed, it needs to draw upon the support of many theoretical and methodological areas with pragmatic considerations of expertise required to conduct business. Keeping that in mind, the International Conference on Knowledge Management (ICKM) started in 2002 with the objective of bringing the academics and practitioners together to share knowledge and exchange ideas. The conference's aim is to encourage collaboration and address issues relevant to today's pressing problems, while delivering tangible benefits to both communities. The outcome, which can be measured through the presentations, publications, and feedback, is a testimony of the benefits of having both communities working in concert.

The collection of papers included in this book from the 2006 International Conference on Knowledge Management, held in Greenwich, London, represents some of the best work by researchers and practitioners in the field of knowledge management. Their subject matter covers a wide range of topics, including: social network analysis and technologies; innovation and creativity; KM tools and technologies; collaboration and knowledge sharing; issues in KM education and training; knowledge discovery (data mining, data warehousing, intelligent agents); knowledge organization (meta data, taxonomies, ontology); and social and psychological dimensions. This book will appeal to information and knowledge management professionals, as well as academicians, practitioners, and researchers who are looking for a deeper understanding of knowledge management research and its practical applications.

Suliman Hawamdeh, Ph.D
Professor and Program Coordinator
University of Oklahoma

Chapter 1

THE BUSINESS TRANSACTION THEORY AND MORAL HAZARDS FOR KNOWLEDGE SHARING: AN EMPIRICAL STUDY

Franz Barachini

University of Technology Vienna & BIC-Austria

Institut für Informationssysteme

Favoritenstrasse 9-11

A-1040 Vienna, Austria

Barachini@bic-austria.at

Individuals don't offer information (knowledge) for free. Therefore, knowledge sharing can be regarded as a business transaction process. During this process humans use a tacit but probably unique function--independent from cultural roots--to evaluate the value of information. After conducting a comprehensive company survey in Europe, we found indicators supporting the business transaction theory. Additionally, we selected a subset of companies and asked employees their thoughts about the motivators for knowledge sharing and working performance. In so doing we performed a cluster analysis and mapped the answers to Alderfer's pyramid. Very important cultural-dependant moral hazards for knowledge sharing were detected.

1. Motivation

Knowledge management is not only an IT challenge; foremost it is discovering how to motivate people to share valuable information so that intellectual capital of a company can be leveraged. Bontis (2002), Edvinsson and Malone (1997) and Sveiby (1997) see intellectual capital as the "stock" of knowledge that exists in an organization at a particular point in time. Managing this stock remains a challenge, as there is the need to socialize and codify tacit knowledge. Furthermore, we found knowledge acquisition was only successful when people were willing to cooperate. Willingness to cooperate, in turn, is strongly dependent on the trust level (Huener et al., 1998) in an organization. And it is not only the

trust level that is important; it is the value of the information itself that plays a major role during information (knowledge) exchange.

Barachini (2003) developed a thought model, which maps the information exchange process between humans to the investment processes of the modern portfolio theory. He argues that knowledge always has been the cornerstone for mankind to survive. Therefore, in his opinion, individuals don't offer information (knowledge) for free. To establish a successful knowledge-sharing culture an organization must especially consider trading aspects of modern portfolio theory and refrain from being exclusively dependent on trust, attitude, leadership, and group support. In the company survey presented herein we found indicators supporting the business transactions theory. We also identified moral hazards, which hamper knowledge exchange within a society. It is important to note that parts of the presented results strongly depend on European culture and cannot be generalized as such.

2. Background of the Business Transaction Theory

Barachini (2002) defined two types of information exchange. Type-1 is the immediate exchange of information in both directions. Thus, sender and receiver give information away. This type of duplex information exchange can be mapped to over-the-counter businesses transactions executed by banks.

Type-2 is more complicated because information flow is, first of all, unidirectional. This concept is better defined in two scenarios: 1) when we consider the fact that we earn money by way of our profession as e.g. a teacher or 2) when we consider that we offer information to individuals, investing in hopes to receive even more valuable information in return at some future date. Type-2 of information exchange can be mapped to the most prominent type of option contracts--the call option for stocks. This agreement gives the buyer the right to buy from the option writer a specific number of shares of a particular company at a specific purchase price at any time¹ up to and including a specific date.

¹ For US options only.

Figure 1 shows the P&L graph² of a buyer. The buyer of a call option will have to pay the writer a premium in order to get the writer to sign the contract. The fair value of an option can be evaluated by the binomial option-pricing model or by the more modern method from Black-Scholes (Sharpe et al., 1995):

$$\text{Fair value} = N(d1) * P_s - E * N(d2) / e^{RT}$$

Where: $d1 = (\ln(P_s/E) + (R + 0.5\sigma^2)T) / \sigma * \text{sqr}T$, $d2 = d1 - \sigma * \text{sqr}T$

P_s = Current market price of underlying stock

E = Exercise price of option

R = Compound risk free rate of return

T = Time remaining before expiration

σ = Risk of the underlying stock

sqr = square root

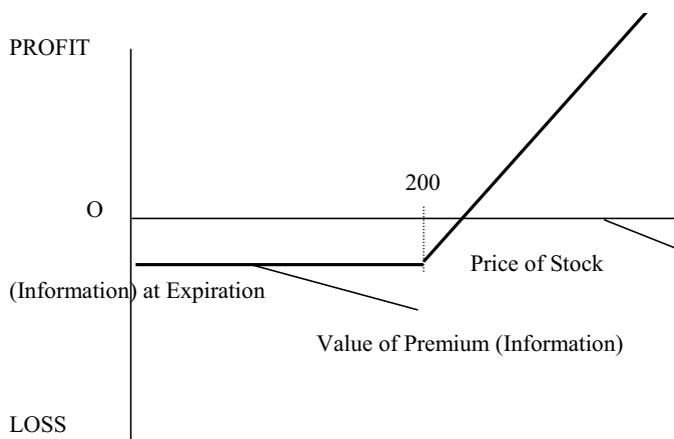


Figure 1. P&L graph for “buy a call”.

² Profit and Loss.

Figure 1 relates the value of a call option with an exercise price of 200 to the price of the underlying stock of expiration. If the stock price is below 200, the option will be worthless when it expires, and the writer will gain the premium. If the price is above 200, the option can be exercised for 200 in order to obtain a security with a greater value than 200. As a result the option buyer will realize a net gain that will equal the difference between the securities market price and the 200-exercise price. However, in practice the calculations are even more complicated due to margin requirements, commission payments, and other market-making activities.

Type-2 information exchange describes the process by which one person (the buyer) gives information away, hoping to get even more valuable information in the future. The information offered to the writer has some value--the premium. The buyer invests in hopes he will receive in return another type of information that is at least as valuable as the information premium he gave. For our purposes, the underlying asset is not stock but again it consists of information. Following the analogy of this theory, then, the person who delivers information is the buyer of a call option.

The difficulty lies in determining how to evaluate a fair price for a piece of information which is yet unknown. The Black-Scholes formula is based on statistics, whereby the exercise price is known, the risk of the underlying common stock can be evaluated, and the option has a well-defined expiration date³. In the case of information brokerage, we don't know even the value of the underlying because it is an unknown piece of information that might be offered from the writer at a future time. In the Black-Scholes formula the current market price of the underlying stock can be evaluated. Since one type of information is evaluated differently from brain to brain, no objective evaluation can be performed for information generated by humans.

Thus, each of us uses our own evaluation function, which might be similar from brain to brain; however, due to different context knowledge, e.g. experience or intuition, the same piece of information is evaluated differently on an individual basis. Therefore statistics like those in the

³ This is true for European options – US options can be exercised arbitrarily.

Black-Scholes formula cannot be applied immediately since the values of Ps, E, R and T represent individual functions. The parameter T is indeterminable since we don't know when and even if we will receive valuable information in the future. Thus, a fair price for information cannot be calculated. Nevertheless, the P&L statement of a call option can be used as a thought model when we talk about information exchange⁴ between humans. By applying a very specific survey we hoped to find justifications for the business transaction theory.

3. The Method

We selected 150 companies in Europe⁵ and asked each to select ten employees⁶ to participate in an electronic questionnaire (see Figure 2).

CODE	QUESTION	Score 0-12
	What is your motivation to exchange information with colleagues in your company? Please distribute scores between 0 (low) – 12 (high)	
Q1	Justification or refutation of personal perceptions	
Q2	More acknowledgement and better acceptance of my person and my ideas	
Q3	As part of a network I need to communicate (rumors, news, needs)	
Q4	I need it because of therapeutical reasons, will get sick otherwise	
Q5	I need it to learn from each other	
Q6	I need it because I have a desire to show off	
Q7	I am dependant on information and sometimes forced to use it	
Q8	To built up trust	
Q9	I am curios	
Q10	I want to reach my own goals	
Q11	I want that my group reaches its goals	

Figure 2. Questionnaire for the online survey.

⁴ Type-2 information exchange.

⁵ Germany, Austria, Switzerland.

⁶ Management & Employees in total 1.500 persons.

Using the online survey, we asked 1,500 people to score on a continuum between 0 and 12 their response to eleven separate statements about the motivation for information exchange within companies.

In the second phase of research we created a focus group with participants randomly selected from 40 of the 150 companies used in the online survey. A structured focus group interview protocol was developed, and two researchers conducted each of the 40 direct interviews, soliciting answers to open questions. The motivation for the open interviews was twofold. Firstly, we reassured ourselves that the respondent understood the electronic questionnaire, and that our interpretation of their answer matched their intent. Secondly, we tried to identify motivators and hazards for the working performance of employees. In so doing, we performed a cluster analysis and mapped the answers to the Alderfer's pyramid. The results reflect the current fears and hopes of the Middle European culture in its worldwide context.

4. Results of the Survey

The results of the survey (Figure 3) show, that seven of the eleven statements were scored above the average level of six points. Figure 3 shows the means of the answers, and Figure 4 shows the variances of the results. According to this plot (Figure 4) we identified that there are exactly three statements with very low variance. Therefore we believed it worthwhile to discuss these three statements thoroughly during the interview phase.

We determined that "justification and refutation of perception", "reaching own goals", "learning from each other", and "building up trust" are the major motivations for information exchange--the latter previously discovered by Huener (1998). However, this result does not justify the business transaction theory. We needed, therefore, to extract the meaning of the statements by conducting interviews, hoping to identify interpretations supporting the business transaction theory.

During our interviews we found that the statement "reaching own goals" needed deeper discussion, especially as it relates to the business transaction theory.

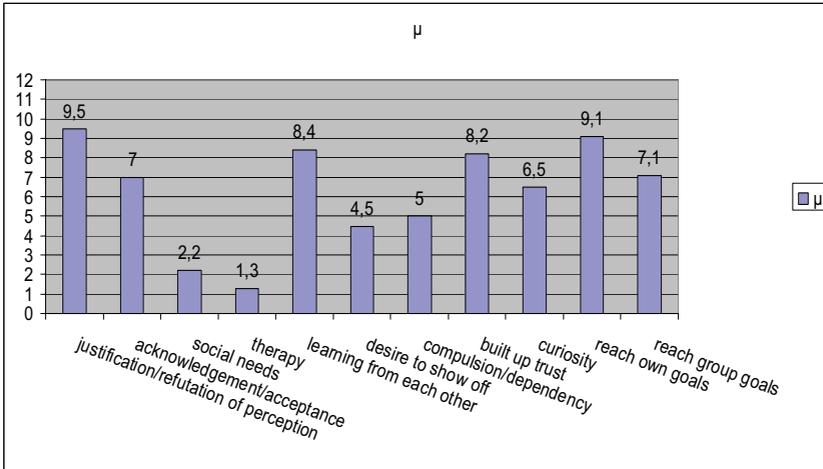


Figure 3. The mean of the answers.

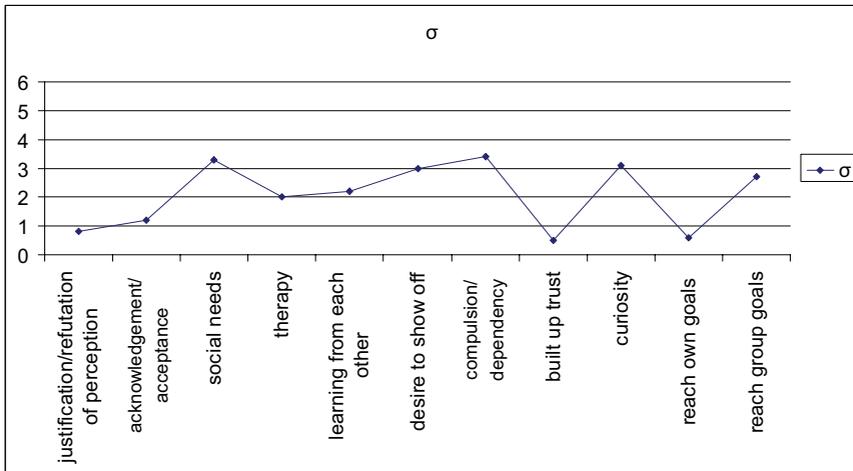


Figure 4. The variances of the answers.

There was common agreement among focus group participants that people’s goals are linked with value. Thus, each goal has some personal value. Since most of the individual goals can only be achieved through information and knowledge sharing, it seems to be the summary⁷ of all

⁷ Or some mathematical function like integral or weighted summary.