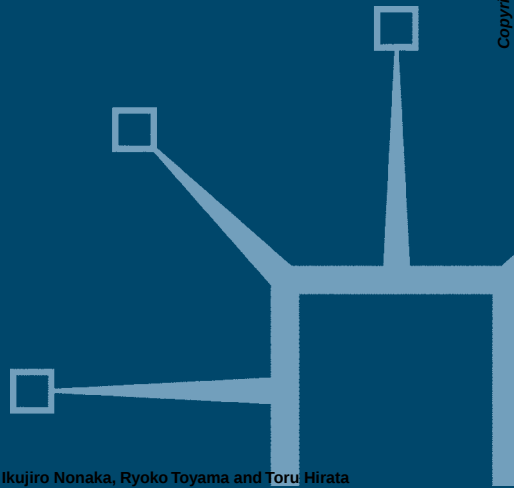


palgrave
macmillan

Managing Flow

A Process Theory of the
Knowledge-Based Firm

Ikujiro Nonaka, Ryoko Toyama and
Toru Hirata



Managing Flow

Also by Ikujiro Nonaka

THE KNOWLEDGE-CREATING COMPANY: How Japanese Companies Create the Dynamics of Innovation (*with H. Takeuchi*)

ENABLING KNOWLEDGE CREATION: How to Unlock the Mystery of Tacit Knowledge and Release the Power of Innovation (*with G. Von Krogh and K. Ichijo*)

KNOWLEDGE CREATION AND MANAGEMENT: New Challenges for Managers (*with K. Ichijo*)

HITOTSUBASHI ON KNOWLEDGE MANAGEMENT (*with H. Takeuchi*)

Managing Flow

A Process Theory of the Knowledge-Based Firm

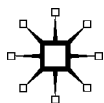
Ikujiro Nonaka
Ryoko Toyama

and

Toru Hirata

In collaboration with Susan J. Bigelow, Ayano Hirose and Florian Kohlbacher

palgrave
macmillan



© Ikujiro Nonaka, Ryoko Toyama and Toru Hirata 2008
Cover designed by Tom Kamegai, GravityOne Inc.

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 W1T 4LP.

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

The authors have asserted their rights to be identified as the authors of this work in accordance with the Copyright, Designs and Patents Act 1988.

First published in 2008 by
PALGRAVE MACMILLAN
Houndmills, Basingstoke, Hampshire RG21 6XS and
175 Fifth Avenue, New York, N.Y. 10010
Companies and representatives throughout the world.

PALGRAVE MACMILLAN is the global academic imprint of the Palgrave Macmillan division of St. Martin's Press, LLC and of Palgrave Macmillan Ltd. Macmillan® is a registered trademark in the United States, United Kingdom and other countries. Palgrave is a registered trademark in the European Union and other countries.

ISBN-13: 978-0-230-55376-7 hardback
ISBN-10: 0-230-55376-1 hardback

This book is printed on paper suitable for recycling and made from fully managed and sustained forest sources. Logging, pulping and manufacturing processes are expected to conform to the environmental regulations of the country of origin.

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

10 9 8 7 6 5 4 3 2 1
17 16 15 14 13 12 11 10 09 08

Printed and bound in Great Britain by
CPI Antony Rowe, Chippenham and Eastbourne

Contents

<i>List of Figures and Tables</i>	vii
<i>Foreword: From the Management of R&D to Knowledge Management</i>	ix
<i>Acknowledgements</i>	xviii
Introduction: Why We Need a New Theory of the Knowledge-Based Firm	1
1 The Characteristics of Knowledge	6
1.1 Knowledge is subjective	7
1.2 Knowledge is process-relational	9
1.3 Knowledge is aesthetic	12
1.4 Knowledge is created through practice	13
1.5 Towards a process theory of the knowledge-based firm	14
2 The Theoretical Framework	18
2.1 The SECI model	18
2.2 A dynamic model of knowledge as the creating process	26
3 Leading the Knowledge-Creating Firm	53
3.1 The abilities that constitute <i>phronesis</i>	55
3.2 Exercising <i>phronesis</i>	65
3.3 Conclusion	66
4 Vision and Driving Objectives: Values for the Common Good	70
4.1 Eisai Co., Ltd	70
4.2 Honda Motor Co., Ltd	87
4.3 Implications	103
5 <i>Ba</i>	107
5.1 Mayekawa Manufacturing Co., Ltd	107
5.2 KUMON Institute of Education Co., Ltd	120
5.3 Implications	133

6	Dialogue and Practice: Leveraging Organizational Dialectics	138
6.1	Seven-Eleven Japan Co., Ltd	138
6.2	Ryohin Keikaku Co., Ltd – Muji	156
6.3	Implications	170
7	Dynamic Knowledge Assets in Process	174
7.1	YKK Corporation	174
7.2	JFE Steel Corporation	185
7.3	Implications	201
8	Leadership: Fostering Distributed Excellence in the Organization	206
8.1	Canon Inc.	207
8.2	Toyota Motor Corporation – Prius project	220
8.3	Implications	231
9	Conclusions	241
9.1	New developments	241
9.2	Future challenges	244
	<i>Notes on Authors</i>	246
	<i>Index</i>	247

List of Figures and Tables

Figures

2.1	The knowledge-creating process: SECI model	19
2.2	A process model of the knowledge-based firm	27
2.3	<i>Ba</i> as shared context in motion	35
2.4	<i>Ba</i> : interpenetration of environment, structure, and agent	40
2.5	Organization as organic configuration of <i>Ba</i> : the knowledge ecosystem	41
3.1	Soichiro Honda watching motor cycle racing	59
3.2	Soichiro Honda drawing a sketch on the ground	61
4.1	Profits as a result of providing customer benefits	72
4.2	Empathizing with patients: Researchers indwelling with the elderly	75
4.3	The concept of a Knowledge Creation Department	82
4.4	Results of the Knowledge Survey	84
4.5	Honda's net sales and other operating revenue/operating margins	88
4.6	Honda's income/return on equity (ROE)	89
4.7	R&D system in Honda R&D Co., Ltd	100
4.8	LPL system to distribute practical wisdom (<i>phronesis</i>)	102
5.1	Mayekawa's business areas	109
5.2	Mayekawa as an organic configuration of <i>doppo</i> s and blocks	111
5.3	Simplified model of <i>kigyouka keikaku</i>	115
5.4	Enrollment trends in the KUMON Centers	122
5.5	Self-learning system of the KUMON method	123
5.6	The process of learning in the KUMON method	125
5.7	Expansion of KUMON activities	129
5.8	Co-creation of <i>ba</i> between Mayekawa and a customer	134
6.1	The knowledge-creating process of Seven-Eleven Japan	139
6.2	Conceptual diagram of product positioning of Muji products	161
6.3	Muji advertisement: Muji bowl in a traditional Japanese <i>Shoin</i> room (left) and Zen garden (right) at Ginkakuji (Jishoji) temple in Kyoto	169
6.4	The view of Muji as an empty container	171
7.1	YKK management principles	176
7.2	Overview of the JFE group	187
7.3	Exchanging personnel at the JFE West Japan Works	194

7.4	JFE Holding's net sales and other operating revenue/operating margin	198
7.5	JFE holding's debt outstanding	198
7.6	Simplified model of the JFE merger	200
7.7	YKK Cycle of Goodness and Spiral of Value Creation	203
8.1	Canon's net sales and other operating revenue/ operating margin	208
8.2	Canon's debt outstanding	208
8.3	Image of cell production system	213
8.4	Canon's organic configuration of "multi-layers of <i>ba</i> "	218
8.5	Various <i>ba</i> of the Toyota Prius project	238

Tables

4.1	Number of <i>hlc</i> projects by division in 2005	77
6.1	Sales and profits of major convenience store franchisers in Japan	140
7.1	Comparison of operating profit over sales (%)	199
8.1	Distributed leadership at the Prius project	222

Foreword: From the Management of R&D to Knowledge Management

Some contributions of Ikujiro Nonaka to the field of strategic management

Introduction

There is no one who in recent years has done more to shape the field of management than Ikujiro Nonaka. The body of work produced over the past two decades has been very influential, both in theory development and in management practice.

Ikujiro Nonaka is a University of California, Berkeley graduate who has been the Xerox Distinguished Professor at the Haas School of Business for almost a decade. But it is not his UC Berkeley lineage that causes me to give praise to a great colleague and friend. Rather, it is his deep insights into the management of the new product development process, and his efforts to help us understand the role of both leaders and middle management in knowledge creation.

Ikujiro Nonaka has become, for many of us, the new Peter Drucker – offering a deep intuitive understanding of management and the ability to see gaps and deficiencies in existing theories, as well as emerging trends which will impact on the nature of the business enterprise and its management. In what follows, I give a selective and perhaps personal history of the field of knowledge management, and try to position his important contributions.

The emergence of knowledge management

Were one to have stood here in Philadelphia 40 years ago and tried to talk to an audience about knowledge management, one would have received mainly blank stares. To get any traction, the conversation would have had to segue into the topic of the management of industrial research and development, as that was the rubric under which one could have a dialog about the new product development process. In 1967 Professor Edwin Mansfield at the Wharton School was only five to ten years into the very first serious scholarly research program aimed at improving understanding of technological innovation and the nature of corporate industrial research in the US (Mansfield, 1968). From that scholarship came a deep understanding of the

nature of industrial research projects, the resource expenditures required at various “stages” in the R&D process, the nature of the technical and market risks involved with technological innovation, the role of patents in appropriability, the cost of patent workarounds, and the factors that drove variation in R&D spending within industries. By 1980, this work had become international in its flavor. Important studies were completed on international technology transfer and the global organization of research. This work showed that the role of offshore R&D at the time was mainly geared to adaptation to local markets.

Mansfield’s work was both descriptive and analytical. Prescription was rare. Business and management scholars at that time puzzled over a limited set of matters such as how to get research from the laboratory to the market, the optimal scale of R&D activities, and the diffusion rates for new technologies. There was very little understanding around how firms generated new knowledge, other than through spending more money on R&D.

The 1980s and 1990s brought a sea change with respect to the innovation process and the nature and scope of competition faced by both domestic and multinational enterprises. This sea change required the development of new conceptual frameworks to understand innovation. Indeed, the study of R&D management gradually morphed into the study of knowledge creation and knowledge management. While Peter Drucker had begun talking about “knowledge workers” as early as 1959, and while Mansfield and others were tabulating the employment rolls of those engaged in science and technology, it was not until much later that the deep importance of skilled personnel and creative talent began to be fully appreciated, and the implications for the management of innovation explored.

Several developments occurred about this time which required a new view of the innovation process:

1. There was a belated recognition in both the scholarly community and in management circles that the creation and maintenance of competitive advantage was not just about scale and scope; it also required continuous innovation by the business enterprise. Hence, the management of intangible assets and of technical and business knowledge was critical to marketplace success in an open and competitive global economy.
2. Rapid economic growth outside the US, and especially in Japan and the Asian newly industrialized countries, meant that the sources of new knowledge were becoming geographically dispersed. Even before the 1980s, innovation had been significantly global. British and German companies had played major roles in the development of jet aircraft. Swiss, German, and British companies had for decades played major roles in the development of pharmaceutical and industrial chemicals. Swedish and Japanese companies had played significant roles in telecommunication and microelectronics. However, globalization amplified as the decades

of the twentieth century ticked by, and the outsourcing of components and assemblies accelerated. As the new millennium began, research and development was itself beginning to be outsourced offshore, especially in software development.

3. The development of low cost and high speed computer and information technologies for use at both the individual and the organizational levels enabled very large amounts of information to be collected, stored, analyzed, and transmitted, all at low cost. The introduction of personal computers, cell phones, PDAs, and web portals assisted connectivity and collaboration. These tools changed the speed and cost of information transfer and processing, as well as data storage. This in turn enabled new organizational processes and opened up knowledge transfer needs and opportunities. Vendors of computer equipment and “knowledge management” tools became active promoters of the need to better manage knowledge.

In the 1990s, Ikujiro Nonaka burst onto this new landscape, with new frameworks to help managers understand how to develop intellectual capital and share knowledge inside the enterprise. His approach was informed by the study of new product development, particularly in Japan. At the time, Japanese firms, especially in autos and electronics, has achieved global pre-eminence in the development of new products and also in manufacturing. Nonaka’s view was that:

the traditional disciplines of management do not lend themselves to knowledge management and should be revised so that the knowledge based competence of a corporation can be managed effectively and efficiently. Traditional notions about strategy, human resource management, finance, and marketing should be re-examined and revised in order to manage knowledge for competitive advantage. (Ichijo and Nonaka, 2007: 7)

In particular, Nonaka has been offering an alternative knowledge-based theory of the firm. In what follows, I endeavor to review some of his contributions and indicate how they contribute to our understanding of management theory and practice.

The knowledge-creating firm and the SECI process

In the neoclassical theory of the firm managers are absent, except inasmuch as they are agents of the shareholders. Ikujiro Nonaka rejects this view and has put the manager back into the theory of the firm. He has advanced the proposition that firms differ not just because they have heterogeneous resources, but because managers have different visions of the firm’s future. “Put simply, firms differ because they want and strive to differ. They evolve

differently because they envision different futures – and structures to realize their futures” (Nonaka and Toyama, 2005: 2). In short, knowledge creation is about both ideas and ideals.

Nonaka also critiqued the view that firms are information processing machines. Rather, the firm should be seen more as a knowledge creating entity that reshapes the environment and itself through knowledge creation.¹

In Nonaka’s (and Toyama’s) conception of the firm, individuals matter. They interact with each other to transcend their own boundaries and as a result change themselves. Subjective tacit knowledge held by an individual is externalized into objective explicit knowledge to be shared and synthesized. Tacit and explicit knowledge complement each other. Knowledge is socially created through the synthesis of the different views of different people.

Through Nonaka’s SECI (socialization, externalization, combination, internalization) process, knowledge keeps expanding. The company’s vision for what it wants to become and the products it wants to produce inspires the passions of employees. The company’s vision for the future must go beyond goals defined by financial metrics alone.

The SECI process is a routine with a difference. It is a creative routine or “*kata*.” *Kata* is about frame-breaking routines that lead to self-renewal. Good leaders help the organization to synthesize contradictions. They also provide vision, and the vision needs to be shared and accepted.

In short, Nonaka’s theory of the knowledge-creating firm views the business enterprise as an entity to create knowledge by synthesizing contradictions. True breakthroughs occur by exploiting and managing what Kuhn (1996) would call a creative tension between the old paradigms and the new. Organizations don’t just solve problems, they create and define them (Nonaka et al., 2000: 3). Leaders and individuals matter. Creativity requires their complementary skills.

The SECI process is the engine that drives Nonaka’s knowledge-creating process. It is not just a mechanical process. Vision, organizational structure, incentives, corporate culture, and metaphors are all in some way implicated. Nonaka recognizes that employees, if they don’t identify with the organization, won’t necessarily help convert tacit knowledge to explicit knowledge. Leadership matters a great deal. Good leaders can accelerate the SECI process and make it more productive.

Middle-up-down management

Another major contribution from Ikujiro Nonaka is that he has resurrected the middle manager in management theory. In his framework, middle managers play a key role in knowledge creation inside the organization by bringing together the visionary ideas of top management and the chaotic realities of front line workers. Top management creates the dream, middle managers

help deliver it by solving the tensions between where things are and where they need to be for top management's vision to be realized. Put simply, knowledge is created by middle managers. They are essential players in the SECI process.

With middle-up-down management, middle managers are not useless drones, as they are sometimes portrayed in the management literature. Nor have they been made obsolete by information technology. Indeed information technology allows the assembly of more information and data, thereby giving middle managers more tools. The middle managers play an integrative role, not unlike the system engineers in predivestiture AT&T.

Jiro's approach is both informed by and relevant to the context of innovation inside middle and large scale (Japanese) organizations. These contexts are not necessarily apt for understanding entrepreneurial start-ups; however, they are apt for helping to understand how the enterprise can sense and seize new opportunities. In that sense, Nonaka's framework is also a useful elaboration of how a large organization can build and maintain dynamic capabilities.

***Phronesis* (practical wisdom)**

Another characteristic of the firm that is necessary for its continued success, according to Nonaka, is Aristotelian *phronesis*. Strategic analysis is unable to "specify exactly how a firm finds a way to create value by finding an unfilled customer need or a new way of fulfilling an existing need" (Nonaka and Toyama, 2007: 371). Part of the reason seems to be Nonaka's belief, which I share, that value creation begins when new opportunities are sensed.

However, strategic planning will not generally help the organization sense opportunities. Rather, "strategy is a process of creating the future" (ibid.: 372). Nonaka's view is compatible with Mintzberg et al.'s (1998) who sees strategy as something more than planning; strategy emerges, possibly alongside planning. Value flows from the ability to adapt to continuous change. Nonaka notes that Weick (2001) calls this process "just in time strategy."

Value creation relies on the ability of the organization to improvise a strategy to capture opportunities at the right moment. The firm can shape its environment while it is being shaped by it. Heterogeneity amongst firms in the same industry flows in part because firm's envision (sense) different futures, and respond differently to (seize) those opportunities.

The ability to understand and bring to fruition that which is considered good by individual customers in specific times and situations is what Nonaka calls *phronesis*. It is not purely a utilitarian concept, as practical wisdom also involves value judgments about what customers and society really want. It is a skill which needs to be distributed throughout the organization.

Reflections

There are a few concluding and comparative reflections I would like to make on Nonaka's important contributions to our understanding of the knowledge-creating firm.

I observe that Nonaka gives little attention to the allocation of resources to R&D. Such expenditures appear to be assumed. The core of the model is a set of processes which engage R&D personnel, designers, marketing and operations, as well as top management. There is a holistic view of innovation that transcends the typical R&D project-setting of much of the work in the innovation studies field.

The framework is different from, but compatible with, dynamic capabilities (Teece, 2007). With dynamic capabilities, the broader set of skills which establish and maintain competitiveness are sensing, seizing, and reconfiguring. This triad has obvious overlaps with SECI as sensing involves using tacit knowledge and making knowledge explicit so that there can be a basis for action. Seizing involves systemizing and applying explicit knowledge. It also involves combining co-specialized assets to exploit economies and address necessary complementarities; reconfiguring involves adapting to changing markets and competition as well as the internal growth of the enterprise.

The framework does not fully embrace the open innovation (Chesbrough, 2007) view of the enterprise. As Nonaka notes, "the firm needs to build its own knowledge assets, and that takes time" (Nonaka and Toyama, 2002: 998). In order not to be left behind, the firm must be good at synthesizing. This may not be all that different from the combinational capabilities stressed by Bruce Kogut and others. On the other hand, Nonaka's frameworks recognize the importance of shared context or place (what Nonaka calls "*ba*"). "*Ba*" need not be limited to a single organization – it can embrace suppliers, customers, governments, and competitors. Perhaps it's a half-open model of innovation. No doubt future writings will bring clarification.

The framework is overtly at odds with the neoclassical theory of the firm (with its emphasis on optimization against known constraints). The essence of Nonaka's enterprise is creativity and innovation. This involves quests and missions, not optimization. It has this in common with much of the new literature on the management of innovation. Nonaka clearly also rejects conceptualizations of the firm that portray the firm as a response to information problems (e.g., Coase, 1937; Alchian and Demsetz, 1972); he embraces instead a knowledge-based theory of the firm, in-line with Penrose (1959) (who sees the firm's planners as image creators rather than information processors), Fransman, and others.

Whether Nonaka's framework is a testable theory is yet to be fully flushed out. At present, the framework is not formulated with testable propositions articulated; but in my view it lends itself to hypothesis formulation and testing.

Testable propositions might be: (i) firms that follow the SECI process have higher R&D productivity; (ii) firms where top management has a clearly articulated knowledge vision perform better; (iii) large firms with engaged middle managers are more innovative; (iv) firms without widely articulated superordinate goals will perform poorly; and (v) strategic planning is neither necessary or sufficient for financial success. No doubt the battalions of doctoral students in the field can refine these hypotheses and begin the audacious and important task of empirical testing. I have high confidence that some statistically significant results will be forthcoming.

I'm not sure the framework fully captures network effects, entry timing, the role of industry architecture, and complementarities and co-specialization – yet these are all important to capturing value from innovation (Teece, 1986, 2006). Perhaps we should take Nonaka literally when he frames his theory around knowledge creating, and not knowledge commercialization. In this regard, I believe that the theory of knowledge creation needs to be married to a theory of knowledge utilization and value capture if it is to become a robust theory to guide management decisions.

The framework recognizes that individuals matter – although methodological individualism isn't especially deep in Nonaka's framework. The SECI process is anchored by middle managers, and is orchestrated by leaders. Socialization – transforming individual tacit knowledge to group tacit knowledge – is part of knowledge creation.

Nonaka's knowledge creating firm and the SECI process is very definitely Japanese. The emphasis is very much on group creativity, and listening to the advice of those with more experience. Age and experience give rise to wisdom, which also has a moral dimension. However, the approach does raise the question of whether Ikujiro Nonaka's leadership model embraces entrepreneurial leadership, and whether the SECI process is fully transferable to US and European contexts. I suspect it is for many large well-established firms; but it may not be fully transferable to new ventures.

So where does this leave my assessment? Note that some of Nonaka's writings have a deep philosophical bent, which makes it hard for some of us to understand. At the same time, this philosophical patina helps us better appreciate that management isn't just about the numbers.

I believe that Nonaka's work has deeply illuminated our understanding of innovation and new product development. His work helps us understand how great companies are led to create great products, and how management matters – not just top management, but middle management too. With the loss of two giants in management in the past 12 months – first Peter Drucker and then Alfred Chandler – we are all lucky to have a third giant amongst us. We want from Nonaka Peter Drucker's long years of productivity and insightful trend spotting; and we need from Nonaka Al Chandler's deep encyclopedic knowledge of the evolution of business in America, Europe, and Japan. We would of course like to see India and China added to the scholarly canvas too.

Jiro, you have more work to do! We salute you for your accomplishments, and we thank you for your contributions.

Remarks delivered in Philadelphia on the Occasion of the Award of the Booz, Allen and Hamilton Distinguished Scholar in International Management.

August 6, 2007

DAVID J. TEECE
Director, Institute of Management,
Innovation and Organization
Professor, Haas School of Business
University of California, Berkeley

Note

1. See Fransman (1994).

References

- Alchian, A. and Demsetz, H. (1972). "Production, information costs, and economic organization," *American Economic Review*, 62: 777–95.
- Chandler, A. (1990). *Scale and Scope: The Dynamics of Industrial Capitalism*. Cambridge: Harvard University Press.
- Chesbrough, H. (2007). *Open Business Models: How to Thrive in the New Innovation Landscape*. Cambridge: Harvard Business School Press.
- Coase, R.H. (1937). "The nature of the firm," *Economica*, 4 (16), 386–405.
- Fransman, M. (1994). "Information, knowledge, vision and theories of the firm," *Industrial and Corporate Change*, 3: 713.
- Ichijo, K. and Nonaka, I. (2007). "Introduction: Knowledge as competitive advantage in the age of increasing globalization," *Knowledge Creation and Management: New Challenges for Managers*. Oxford: Oxford University Press.
- Kuhn, T.S. (1996). *The Structure of Scientific Revolutions*. Chicago: The University of Chicago Press.
- Mansfield, E. (1968). *Industrial Research and Technological Innovation*. New York: WW Norton.
- Mintzberg, H., Ahlstrand, B. and Lampel, J. (1998). *Strategy Safari: A Guided Tour Through the Wolds of Strategic Management*. New York: Free Press.
- Nonaka, I. and Toyama, R. (2002). "A firm as a dialectical being: Toward a dynamic theory of a firm," *Industrial and Corporate Change*, 11(5): 995–1009.
- Nonaka, I. and Toyama, R. (2005). "The theory of the knowledge creating firm: Subjectivity, objectivity and synthesis," *Industrial and Corporate Change*, 14(3): 419–36.
- Nonaka, I. and Toyama, R. (2007). "Strategic management as distributed practical wisdom (phronesis)," *Industrial and Corporate Change*, 16 (3): 372–94.
- Nonaka, I., Toyama, R., and Nagate, A. (2000). "A firm as a knowledge creating entity: A new perspective on the theory of the firm," *Industrial and Corporate Change*, 9 (1): 1–20.
- Penrose, E. (1959). *The Theory of the Growth of the Firm*. Blackwell: Oxford.

- Teece, David J. (1986). "Profiting from technological innovation," *Research Policy*, 15 (6): 285–305.
- Teece, David J. (2006). "Reflections on profiting from technological innovation," *Research Policy*, 35 (8): 1131–46.
- Teece, David J. (2007). "Explicating dynamic capabilities: The nature and microfoundations of (sustainable) enterprise performance," *Strategic Management Journal*, 28: 1319–1350.
- Weick, K.E. (2001). *Making Sense of the Organization*. Oxford, UK: Blackwell.

Acknowledgements

This book is the fruit of our quest to understand the significance of knowledge as a resource for business management. The quest began in 1982, when we presented research on innovation processes at Japanese companies to a symposium at Harvard Business School. During discussions at the symposium, we realized that these companies were not just processing information, but creating knowledge organizationally. This new perspective led us to pursue research on the process in which organizations create knowledge. The work resulted in a series of articles and books, including *The Knowledge Creating Company* by Nonaka and Takeuchi in 1995, in which we proposed the SECI model to describe a process of creating organizational knowledge from individual knowledge through human interaction. We believe the model had a big impact because it offered the new perspective that management is based on knowledge resources rather than physical resources, and on tacit knowledge in particular.

It has been 13 years since *The Knowledge Creating Company* was published, and the environment for firms has drastically changed. Firms in developed economies today, such as in the United States, Europe, and Japan, need to find a way to sustain growth through continuous innovation while also acting as responsible members of society. Firms in the so-called BRICs, or newly developing economies, have to find a way to set rules for managing their energies to realize sustainable development. In the era of the interconnected global economy, where activities in one country more immediately affect those of another, the firm has a responsibility to show that it has a reason for existing and a purpose in society other than for profit maximization. This calls for theory that can explain the process in which firms set their goals and implement strategies to achieve them.

In this book, we propose a new theory of the firm as a knowledge-based entity. Building on knowledge-creation theory and incorporating process philosophy, we re-examine the role of human beings in an organization from an ontological and epistemological point of view, based on the understanding that knowledge is a resource that is created by human beings in relationships. We argue that knowledge as a management resource cannot be understood without understanding the interactions of the human beings who create it. This is predicated on our view that each human being is a unique collection of experiences and is in a constant state of *becoming* to create a future through embracing and managing of contradiction. In this interactive process, individuals continually change themselves and their environments, and management of the firm becomes a reflection of this activity.

We chose the book title, *Managing Flow*, because our interest is in the *process* in which a firm creates its future by changing itself and its environment through knowledge creation. All things flow in continuous interaction and relation to each other, and this applies to human beings, firms, and the larger environment. Knowledge also flows and is in continuous change. Hence, all firms face the inherent contradiction of needing both stability and change to survive in the flow. We believe that the firms in our case studies overcome this contradiction by managing flow.

We would like to thank several people for their help in writing and editing this book. Professor David Teece at the Haas School of Business, University of California Berkeley, gave us tremendous intellectual stimulation and suggestions for building the theory through the many discussions we have had over the years. We also learned many things from discussions with Professor Dick Ellsworth of the Drucker School at Claremont Graduate University, where Ikujiro Nonaka currently serves as the first Distinguished Drucker Scholar. Hirotaka Takeuchi, dean of the Graduate School of International Corporate Strategy at Hitotsubashi University, gave us much support in conducting the research. Our research was also supported with funds from the Japan International Cooperation Agency (JICA). Working with JICA helped us to think about the role of the firm in society in other countries in Asia. In completing the book, we owe a lot to the following three persons. Susan J. Bigelow served as general editor, providing critical analysis and original writing to help us articulate the core concepts of the theory. Ayano Hirose translated the cases into English, contributing both writing and editing. Florian Kohlbacher helped us review the literature and contributed writing in part of one case. Critical comments, suggestions, and encouragement from professors Noboru Konno of Tama University, Tokyo, Georg von Krogh of the Swiss Federal Institute of Technology, Zurich, and Professor Zhichang Zhu at the University of Hull Business School, Hull, helped us make our way forward. Without these contributions, we would not have been able to finish the work. Finally, we thank Virginia Thorp and Emily Bown at Palgrave Macmillan for their efficient and supportive way of working with us. We extend our deepest appreciation to all.

Writing the book was itself an interesting and meaningful process of externalizing our own tacit knowledge accumulated through years of research. We learned many things about the potential and creativity of human beings. It is our sincere hope that the book communicates the essence of the knowledge-based firm to our readers.

May, 2008

IKUJIRO NONAKA
RYOKO TOYAMA
TORU HIRATA
Tokyo

This page intentionally left blank

Introduction: Why We Need a New Theory of the Knowledge-Based Firm

We are currently in the midst of great change, a condition which Lester Thurow (2003) called the third industrial revolution. It is a shift towards a knowledge-based economy, where knowledge is the most important resource, superseding the traditional management resources of land, capital, and labor (Drucker, 1993). This has stimulated more active discussion about the theory and practice of “knowledge management.” Yet most firms still have serious difficulty understanding the knowledge resource, and we still lack an effective theoretical framework for understanding the operations of the firm in the knowledge-based economy.

In the world of business practice, knowledge management first took the form of heavy investment in information technologies (IT), an approach that turned out to be painfully ineffective, if not a downright failure. This was the result of the major misunderstanding that knowledge management is only about the efficient storage, transfer, and use of information, and the term “management” itself was misconstrued as the simple administration or supervision of information systems. In fact, knowledge is different in nature from information or physical resources, and unless we understand the essential nature of knowledge, we cannot share it or use it, and, more importantly, create it effectively.

In the academic world, the dominant management theories continue to be based on a view of the firm as a stable, atomic entity that operates according to a set of universal principles, and research is directed towards clarifying what these universal principles are and trying to make them more precise. While this theoretical approach can explain in hindsight why firms have been successful or unsuccessful in profiting from knowledge and protecting knowledge assets, it cannot effectively explain how firms create the particular knowledge that is unique to their practice.

To understand the paradigm shift to the knowledge society we have to make an equivalent paradigmatic shift in the way we think about knowledge

and its management. Rather than conventional knowledge management, what we need is *knowledge-based management* derived from a comprehensive theory of the firm that explains the complex process of how knowledge is created and utilized organizationally through interaction with the environment. This book is our attempt to build such a theory. We believe it is unique in dealing with the subjective, process-relational, practical, and aesthetic aspects of knowledge creation and management in a holistic framework. In the knowledge economy, the firm doesn't just plan for the future, it continuously creates the future. What differentiates firms from one another is their vision of the future and their practical ability to act to realize that future by using their aesthetic sensibilities to create knowledge.

Since knowledge is created by human beings, we cannot theorize knowledge creation apart from human subjectivities, such as individual thoughts and feelings, ideas, hunches, and dreams. And we cannot understand how firms create knowledge that is unique to them unless we understand the role and function of human subjectivity in that process. The dominant theories of the firm have tended to avoid this side of management in the effort to pursue "good science," which is defined as excluding subjectivity in the search for objective "facts" and universal rules that govern how these facts connect. This neglect of the human factor has resulted in management theories that treat human beings as just another resource, like land and capital. They fail to account for the significance of human instinct and emotion and context in the management process, while bypassing altogether the human process of knowledge creation. As Christensen and Raynor (2003: 178) bluntly state: "Resources are usually people or things – they can be hired and fired, bought and sold, depreciated or built."

Our theory parallels the process-relational view of the firm, derived from the process philosophy of Alfred North Whitehead. This recognizes the ever-changing, interrelated nature of knowledge creation. It is contrary to the conventional view of knowledge as a self-contained substance and of the firm as a static, information-processing machine: the machine takes in information from the environment, processes it, and sets output levels to *adapt* to the environment. Such a view cannot conceptualize the actual process of knowledge creation. Knowledge is not a static substance or thing but an ever-changing process of interaction in an ever-expanding field of relations. So, to understand knowledge, we have to examine the process of human interaction and change. The theory of knowledge creation views knowledge as a dynamic process and the firm as a dialectical entity in active relationship with its environment. The existence of knowledge and of the firm is not independent of the environment but *in* the environment in relation with others, emerging in interaction with others, and reshaping itself and others and the environment through these interactions. Knowledge-creation theory is based on a view of the world and all things in it as in continuous "flow." The relationship with the environment is characterized

by the active creation of change rather than the passive reaction to change. To understand this dynamic process, we need a theory of the knowledge-based firm that can explain how firms perceive and interpret realities, interact with various players both inside and outside the organization, and synthesize various subjective interpretations into a collective knowledge that becomes objectified and validated as a universal knowledge asset of the firm.

Our theory is practical in that it deals with real-life management practice as it is. Knowledge and its management must be concerned with the subjective time that is “here-now” and the value judgments made according to each particular situation or context. These situations cannot be distilled into a universal formula for the operation of the firm. They are simply the realities that each firm has to deal with. This book is not a “how to” of management practice. Rather, our aim is to theorize management not only as science but also as art, and build a theory that grasps the essential reality of life in the firm.

Since knowledge and its management is an accumulation of value judgments, management theory necessarily involves issues of aesthetics and ethics. In the era of the knowledge society, the question has shifted from one of quantity (how much should we produce?) to quality (what and why should we produce?). It is people's values and value-based decisions that determine the way of life in an organization, its *raison d'être*, and the value the organization creates. Hence, the knowledge-creating firm creates value by constantly asking and answering on a daily operational basis the human ontological question “why do we exist?” and the aesthetic question “what is good?”. We draw on Aristotle's concept of *phronesis* – prudence or practical wisdom – to show how values, aesthetics, and ethics enter into the process of organizational knowledge creation. In our view, the essence of business is not about bettering the competition to maximize profit. It is about the relentless pursuit of the firm's own standard of excellence. Excellence emerges only with an unyielding commitment and practice to serve the common good of the company, its employees, its customers and other stakeholders, and the larger society, based on the company's own vision and values. Values are created through the continuous effort of doing one's best and creating knowledge and innovation to realize the future one has envisioned. Profit is a result of such value creation, not a purpose in itself.

While our theory draws on the philosophical works of Aristotle, Nishida, Polanyi and Whitehead, we are not concerned with philosophical speculation. We are neither philosophers nor interpreters of philosophy. Rather, we aim to integrate these philosophical ideas and concepts to develop a process theory of the knowledge-based firm. In Chapter 1, we discuss the nature of knowledge and why existing theories do not adequately explain the knowledge-creating process. In Chapters 2 and 3, we present the theoretical framework of the book. Subsequent chapters discuss the main elements of

the theory and illustrate them with real-life examples from companies engaged in knowledge-based management. Both the theory and the practical examples emphasize the creative capabilities of the human being and how this leads to innovation on an organizational level. In the spirit of Whitehead's *Adventures of Ideas* (1933), we aim to contribute a theory of the firm in the knowledge society that integrates philosophy with the actual behavior and circumstances of knowledge-creating firms.

We use case study because the essence of process cannot be captured using the traditional scientific method of analyzing substance. Flyvbjerg (2006: 379) has pointed out that case study, precedent, and exemplars provide a method of research most appropriate to phronetic organizations, noting that "history is central to phronetic organization research [...] as narrative containing specific actors and events." The human being is a story-telling animal, and the notion of history is as fundamental as the notion of action (MacIntyre, 1984: 214, 216). Narrative is the act of description and explanation in story form, consisting of a beginning, middle, and end (Aristotle, 2002; Danto, 1985). It is an effective approach to understanding organizational complexity because it makes it possible to maintain contextuality, reflexivity, purpose and motives, and temporal sensitivity for grasping and explaining actuality (Tsoukas and Hatch, 2001). Furthermore, narrative is effective in explaining not only "why," by describing the causality between events, but also in explaining the dynamic question "how" – not "how to" but "how has this come to be" – because it is based on value judgment and practical reasoning about means-ends relationships. Practical reasoning occurs as a sequence of thoughts and actions toward a goal, establishing a means to realize that goal with the recommended action and performance of that action. Thus, the essential question in phronetic management concerns what action to take, and this can only be answered by the question, "What story or stories do I find myself a part of?" In this book, we have attempted to describe and explain the particular organizational events with interesting and focused narrative detail that allows us to abstract and articulate universals that explain the "how."

Knowledge is created through the synthesis of contradictions. The book title itself, *Managing Flow*, posits the seeming contradiction that if "all is in flux" we can manage nothing. The intention of Heraclitus was not to suggest that everything flows randomly without intention, but to stress the necessity of discerning and understanding the rules behind the flow, be it an attractor in chaos or a law of the universe. To do this, we have to be able to look at the process to grasp the essence of the actual. However, just seeing the essence is not enough. To survive in the constant flow of unceasing change and interrelatedness, we cannot be mere observers or reactors. We have to take *action* when facing a particular situation in order to change the flow. *Phronesis* is the ability to grasp the essence of a situation in process and take the action necessary to create change. This book is our attempt to build

theory to explain how firms manage flow by exercising *phronesis* so they are able to continue to create knowledge in an ever-changing world.

References

- Aristotle. (2002). *Nicomachean ethics* (S. Broadie & C. Rowe, Trans.). New York: Oxford University Press.
- Christensen, C.M. and Raynor, M.E. (2003). *The Innovator's Solution: Creating and Sustaining Successful Growth*. Cambridge, MA: Harvard Business School Press.
- Danto, A. C. (1985). *Narration and knowledge*. New York: Columbia University Press.
- Drucker, P.F. (1993). *Post-Capitalist Society*. New York, NY: Harper Business.
- Flyvbjerg, B. (2006). Making organization research matter. In S. Clegg, C. Hardy, T. Lawrence & W. Nord (Eds.), *The SAGE handbook of organization studies, second edition* (pp. 370–387). Thousand Oaks: SAGE publications.
- MacIntyre, A. (1984). *After virtue: A study in moral theory (2nd ed.)*. Notre Dame: University of Notre Dame Press.
- Thurrow, L.C. (2003). *Fortune Favors the Bold: What We Must Do to Build a New and Lasting Global Prosperity*. New York, NY: HarperCollins.
- Tsoukas, H. and Hatch, N. J. (2006). Complex Thinking, Complex Practice: The Case for a Narrative Approach to Organizational Complexity. In R. MacIntosh, D. MacLean, R. Stacey and D. Griffin (eds.), *Complexity and Organization: Readings and Conversations*. Oxson: Routledge. 247–276.
- Whitehead, A.N. (1933). *Adventures of Ideas*. New York, NY: Free Press.

1

The Characteristics of Knowledge

In this chapter, we discuss the nature of knowledge and how it differs from other resources. This will explain why we need a new theory of knowledge and its management. The issue of knowledge in theories of the firm has been addressed mainly in the resource-based view of the firm, where it has been treated as one of the important resources that lead to above average returns (Winter, 1987; Prahalad and Hamel, 1990; Nelson, 1991; Kogut and Zander, 1992; Leonard-Barton, 1992; Teece et al., 1997). The central questions in this view have been concerned with what kind of knowledge resources bring above average returns, how a firm can realize potential profit from the knowledge it owns, and how a firm can protect such knowledge as a resource. Although this view recognizes the dynamic capability of the firm (Teece et al., 1997; Teece, 2007), many of the arguments tend to focus on the utilization of resources, rather than on the dynamics in which the firm continuously builds resources through interaction with the environment. What is missing in the resource-based approach is a comprehensive framework that shows how various parts within and across organizations interact with each other over time to create something new (for a detailed critique see, e.g., Priem and Butler, 2001). The so-called knowledge-based view of the firm (Grant, 1996; Spender, 1996; Nonaka and Toyama, 2005) that grew out of the resource-based view tries to overcome this weakness. As Spender observed, “knowledge-based theory of the firm can yield insights beyond production-function and resource-based theories of the firm.” He calls knowledge-based theory “a platform for a new view of the firm as a dynamic, evolving, quasi-autonomous system of knowledge production and application” (Spender, 1996: 59).

Further, in the resource-based view of the firm knowledge is treated as one of many revenue-generating resources. The intangibility of knowledge as a resource is well recognized and discussed, but this is still insufficient for understanding the role of knowledge in management and the process in which knowledge is created. The nature of knowledge as a management resource differs greatly from that of physical resources. The attributes of



You have reached the end of the preview for this book / chapter.

You are viewing this book in preview mode, which allows selected pages to be viewed without a current Palgrave Connect subscription. Pages beyond this point are only available to subscribing institutions. If you would like access the full book for your institution please:

- Contact your librarian directly in order to request access, or;
- Use our Library Recommendation Form to recommend this book to your library
(<http://www.palgraveconnect.com/pc/connect/info/recommend.html>),
or;
- Use the 'Purchase' button above to buy a copy of the title from
<http://www.palgrave.com> or an approved 3rd party.

If you believe you should have subscriber access to the full book please check you are accessing Palgrave Connect from within your institution's network, or you may need to login via our Institution / Athens Login page: (<http://www.palgraveconnect.com/pc/nams/svc/institutelogin?target=/index.html>).

Please respect intellectual property rights

This material is copyright and its use is restricted by our standard site license terms and conditions (see http://www.palgraveconnect.com/pc/connect/info/terms_conditions.html). If you plan to copy, distribute or share in any format including, for the avoidance of doubt, posting on websites, you need the express prior permission of Palgrave Macmillan. To request permission please contact rights@palgrave.com.