

KNOWLEDGE INTEGRATION DYNAMICS

Developing Strategic Innovation Capability

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Acknowledgments

This book, which discusses activities related to corporate innovation strategies, was born out of the close observations and analyses that I have built up over many years at my business workplace. I have experience of working in the exciting fields of new product and service development, and internal corporate ventures in the dramatically changing IT and telecommunications sectors. Using my personal experience of business, I felt that the driving power that supports corporate innovation strategy has its starting point as the knowledge held by people and groups, leadership of top and middle management, and the practice process mechanisms of actual business execution. This knowledge, leadership, and practice process go on to formulate and implement the dynamic innovation strategies of companies (or individual organizations).

This book could not have been completed without the painstaking and rigorous interaction that I have had with many practitioners. I would like to extend my gratitude to these practitioners, who are of a number too great to count. Especially, I would like to thank, the senior executives and managers of the companies (high-tech Japanese, South Korean, and Taiwanese companies including NTT, Panasonic,

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Mitsuru Kodama

Preface

The Knowledge Integration Firm

Japanese companies are learning how to survive and revitalize in the global markets of the 21st century. This book aims to clarify the sources of competence for Japan's outstanding companies and general trading companies through in-depth case studies of their consumer electronics, communication and telecommunication equipment, machine tools, semiconductor, information and telecommunications. It also considers the *knowledge integration firm* as a new corporate model distinct from Western management model.

The skillful coordination and collaboration of Japan's corporate knowledge and organizational boundaries aimed at technological and marketing innovations both renew accumulated path-dependent knowledge and dynamically integrate diverse knowledge inside and outside the company. They create distinctively new models of Japanese leadership and knowledge integration for business leaders.

The *knowledge integration firm* integrates diverse core knowledge inside and outside the company, and strategically innovates new products, services, and business models. Strategic innovation involves the

constant, strategic creation of products, services, and business models to acquire long-term, sustainable, and competitive excellence. It embraces the radical reformation of conventional products and services and the creation of new business models that transform existing business rules. The process of acquiring new knowledge and creating innovations builds up the dynamic organizational capability, which helps to establish a company's position in new markets and technologies. In this book, I use the term *strategic innovation capability* for the organizational capability to realize this kind of continuous strategic innovation.

This book emphasizes how the knowledge held by individuals, groups, and organizations (inside and outside the company) comes to underlie analytical frameworks for grasping dynamic strategic innovation and *strategic innovation capability*. I believe this new knowledge created from diverse knowledge and organizational boundaries (inside and outside these companies) drives strategic innovations arising from *strategic innovation capability*. I consider, especially, that the knowledge integration generated from various boundaries (inside and outside the company), including customers and partners, is a source of strategic innovation. It leads to the *strategic innovation capability*, which creates a sustained competitive edge.

This book presents theoretical frameworks and managerial implications relating to the knowledge integration process in which the knowledge held by people, groups, and organizations transcends knowledge and organizational boundaries to become dynamically shared and integrated. New knowledge (e.g., the development of new products, services, and business models) *strategic innovation capability* are also created. This book also classifies knowledge integration architecture that realizes dynamic knowledge integration at multiple knowledge and organizational boundaries. It presents in-depth case studies to reflect a new, dynamic view of strategy essential to obtain a competitively outstanding *strategic innovation capability*.

Features of Japanese Companies

Outstanding Japanese companies are maintaining and developing organizational culture rooted in the shared values of teamwork

(Kodama, 2001), commitment (Ouchi, 1980), and community spirit (Drucker, 2004). They focus on organizational knowledge creation activities (Nonaka and Takeuchi, 1995) based on accumulated tacit knowledge, while studying the Western management practices (e.g., selection and concentration, strategic alliances, strategic outsourcing, speed management, organizational flattening, knowledge management, re-engineering, and payment by results). Japanese companies are honing their competitive edges by combining the merits of both Japanese management and Western management. Following the Japanese economic crises of the 1990s, some scholars observed the fascinating phenomenon of Japanese firms seeking to revitalize their innovative capacity by applying Western knowledge management practices (Lampel and Bhalla, 2007).

Japanese companies are maintaining technological and service innovations, and market share at top global levels, particularly in areas where the competitive environment is fierce (e.g., digital consumer electronics, automobiles, communication and telecommunication equipment, factory automation (FA), mobile phone services, and game business). The world could learn from successful examples of Japanese companies in these high-tech areas.

Features of Japanese management can be summarized in the following four points:

1. The value chain model of Japanese companies arising from vertical integration encourages the creation of competitively new products, services and innovative business models. This is called the *vertical value chain model*.
2. Coordination and collaboration across industries encourage the creation of win-win business models. This is called the *co-evolution model*.
3. The dynamic knowledge integration process crossing knowledge boundaries inside and outside the company is a core competence of Japanese companies.
4. The *knowledge integration process* of Japanese companies enables the acquisition of *strategic innovation capability*.

The first feature of Japanese management is the creation of good tacit knowledge, which has become the core of the value chain. Leading examples of companies claiming a prominent share of the global market for digital consumer electronics include Sharp for LCD TVs, Canon for digital cameras, and Panasonic for plasma TVs and DVD recorders. These companies daily accumulate and update expertise on marketing, product development and production technology through skillful coordination and integration of knowledge and organizational boundaries among different specialist fields (Brown and Duguid, 2001). At the same time, they optimize the entire value chain crossing vertical boundaries and integrate horizontally to dominate the global market (Kodama, 2007a).

The impact of Japanese companies' core competence management focusing on the development and production processes of core components such as system LSI, flash memory, and analog devices (Hamel and Plaharad, 1994) extends to semiconductor manufacturers in other countries. Business models such as these, which build value chains through vertical integration crossing vertical boundaries, are observed both in high-tech areas manufacturing and distinctive general trading companies. Japanese general trading companies profit as they build win-win relationships among partners aimed at optimizing overall business process value chains ranging from resource development, raw materials trade, manufacturing and processing, intermediate distribution, to retail.

The second feature involves the leadership to build new business models crossing industrial boundaries. Leading cases are mobile phone business (NTT DoCoMo and KDDI), and game business (Sony and Nintendo). These companies are exploring completely new business domains through coordination and collaboration of horizontal boundaries resulting from industry-crossing strategy alliances. The mobile Internet led by i-mode, movie and music distribution, mobile e-commerce, positioning data, and telematics in the mobile phone business, and PlayStation, DS, and Wii in the game business are key examples.

The current situation is that Asian and European mobile phone companies are catching up with the advanced Japanese business

models. Meanwhile, Apple's music distribution business has built a new value chain connecting the iTunes music store and iPod platform with music and movie content. iPhone is also building a platform to deliver a range of content to users including voice communications and multimedia data. This Apple business model, however, resembles the co-evolution model of the win-win business ecosystems created by Japan's i-mode (Kodama, 2002; Peltokorpi, Nonaka and Kodama, 2007).

These two features indicate strategic innovation through coordination and collaboration of vertical and horizontal boundaries. They are referred to especially as *boundaries innovation* in this book.

The third feature is Japanese companies' distinctive core competences, which are instrumental in achieving the first two features. It is the *knowledge integration process* resulting from Japanese companies' skillful coordination, collaboration, and integration of vertical and horizontal boundaries. It builds value chains through vertical integration crossing vertical boundaries and new business models crossing industry boundaries. It advances accumulated in-house, path-dependent knowledge, proactively absorbs new knowledge (including path-breaking knowledge) from outside the company (Karmin and Mitchell, 2000; Graebner, 2004), dynamically integrates these different aspects of knowledge, and creates new business models.

The fourth feature is that the *knowledge integration process* drives *strategic innovation capability*. This capability enables the strategic innovation that strategically and continuously generates new products, services, and business models for companies to acquire long-term, sustainable and competitive excellence. Japanese companies have been continuously evolving and developing high-tech product innovations through *boundaries innovation* (mentioned above). *Strategic innovation capability* constantly improves conventional products and services while creating new business models that transform these radical innovations and existing business rules.

In this book, the term *knowledge integration models* refers to the corporate models with these four features. The term *knowledge integration firm* refers to the corporate bodies that apply these models.

The Framework of Analysis

With the *knowledge integration model*, the skillful coordination, collaboration, and integration of vertical and horizontal boundaries promote the dynamic *knowledge integration process*, and build *strategic innovation capability*. They strategically and continuously create new products, services, and business models, and realize strategic innovation. This book will offer an in-depth analysis of Japanese companies' distinctive business models comprising the four features mentioned above.

Dealing with the first feature, the book focuses on describing Japanese companies' skillful integration of knowledge and competence (inside and outside the company) based on vertically integrated value chain models, and the vertical value chain model creating new products and services. To demonstrate the second feature, the book describes Japanese companies' expansion of their own horizontal boundaries, and the co-evolution model creating new business through skillful coordination and collaboration crossing heterogeneous industries. To clarify these two issues, it is necessary to analyze elements of management drivers (Sanchez and Mahoney, 1996) and organizational form of the distinctive Japanese companies that determine corporate boundaries vertically and horizontally as strategic positions.

The focus of the third feature is to clarify the *knowledge integration process* that is also the core concept of the *knowledge integration model*. For this purpose, it is necessary to analyze practitioner thinking and behavior in the built organization form at a micro-level to discover what effectively controls Japanese companies' management drivers. The practitioner thinking and organizational behavior are the areas of formation of dynamic human networks (inside and outside the company) and creation of new knowledge and competences. The *dynamic knowledge integration process* and leadership models created by these practitioners need to be considered.

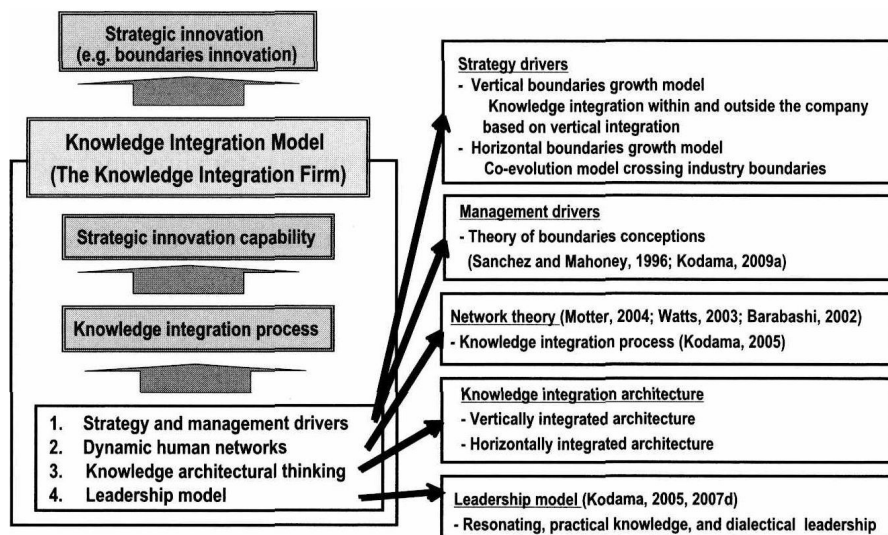
The focus of the fourth feature is to describe the *strategic innovation capability* created from the *knowledge integration process*. Corporate innovation requires different knowledge integration processes at different stages (from basic research to implementation)

and the organizational capabilities responding to these processes. Accordingly, it is necessary to describe the systematization of innovation processes responding to internal and external environments (such as changes in the degree of uncertainty), the specification of elements of individual knowledge integration processes and organizational capabilities responding to situations, and elements of strategic innovation capability by which a company strategically and continuously creates strategic innovation.

Moreover, this book will consider the mechanisms of the *knowledge integration process*, (feature 3) which realizes the boundaries innovation (features 1 and 2) and the *strategic innovation capability* (feature 4). It will clarify the forms of the Japanese company's *knowledge integration model* and the *knowledge integration firm* that embodies it.

The Book's Structure

Part 1 deals with theory. Chapter 1 presents the *knowledge integration model* and its embodiment in the framework of the



Analytical Framework of this Research.

knowledge integration firm. The framework of the *knowledge integration model* is formed from the concepts of the *dynamic knowledge integration process* and the *strategic innovation capability* that arises from this process. Moreover, the *knowledge integration process* is formed from the individual key concepts of strategy and management drivers, dynamic human networks, knowledge architectural thinking, and leadership models. Here, I will present these key concepts and clarify their relationship with the *knowledge integration process* (see Figure).

Chapter 2 introduces the concept of *strategic innovation capability* created from the *knowledge integration process*. It compares “dynamic capability” (Teece, *et al.*, 1997), which is the forerunner of this *strategic innovation capability*, “MI (major innovation) dynamic capability” (O’Connor, 2008) applying a focus on radical innovation, and “breakthrough innovation capability” (O’Connor, Leifer, Paulson and Peters, 2008). The *strategic innovation capability* proposed in this book presents concepts embracing the four capabilities:

- The management capability of the diverse knowledge integration process in the innovation process responding to object and situational strategies.
- The management capability to realize spiral strategic innovation loops among domains (domains are defined as each development stage of the innovation process).
- The management capability within and among domains (including shifts).
- The integrative competences that co-establish the two different archetypes arising from dialectical management.

Part 2 presents case studies. Chapter 3 looks at Japan’s biggest telecom company, NTT, and considers the mechanism by which *strategic innovation capability* is acquired through implementing dialectical management and a spiral strategic innovation loop arising from the dynamic knowledge integration process at each stage of the innovation process, from the past to the future.

Chapter 4 reflects the differences between Japanese and Western business in the consumer electronics, communication and telecommunication equipments, and semiconductor industries. It demonstrates the creativity of Japanese companies and considers the mechanism that realizes the vertical value chain model.

Chapter 5 looks at Japan's machine tool manufacturers to study the organizational strategy and "Ba" management, which become enablers realizing vertical value chain models aimed at continuous innovations of product architecture.

Chapter 6 focuses on Japan's mobile phone business to demonstrate the mechanisms of *strategic innovation capability*, which realizes the co-evolution model arising from dialectic-view thinking and behavior among Japanese companies in these areas.

Chapter 7 looks at the *knowledge integration process* with regard to Nintendo's product development. It also considers how the dialectical thought of markets and technology becomes an enabler acquiring *strategic innovation capability*.

Chapter 8 refers to a major Japanese general trading company, Mitsubishi Corporation. It considers the structure of the business models and personnel management for the vertical value chain and co-evolution models arising from the expression of *strategic innovation capability*.

Part 3 is a general review. Chapter 9 delivers the following three theoretical and managerial implications based on the theories in Part 1 and the case studies in Part 2. The first implication relates to the *knowledge integration process* and related topics. The "knowledge integration firm" constantly generates new product and business concepts from the creation of new knowledge. This concluding chapter demonstrates this relationship of dialectical synthesis among concepts and knowledge, and considers the *knowledge integration dynamics* framework from the viewpoints of conceptualization, dynamic practical knowledge, *strategic innovation capability*, the knowledge integration process, and the new theory of *knowledge difference*.

The second implication is a company's ideal strategy-making process (analyzed at an individual business and project level), the

practice process to achieve it, and how the timing and resource distribution of the *knowledge integration process* informs policy and practice. The co-establishment of current and future strategy becomes an important issue in avoiding such problems as path-dependency, competency traps, and core rigidities.

The third implication is the *knowledge integration process* and related topics. It indicates how the knowledge architectural thinking of practitioners can integrate boundaries embedded with valuable and diverse knowledge distributed inside and outside the company. Chapter 9 also looks at how the *creativity* and *dialectic* views, which form distinctive elements of the Japanese company's *knowledge integration model*, have been able to influence leading companies in Asian countries including South Korea and Taiwan. Chapter 10 concerns the conclusions of this book.

About the Author

Mitsuru Kodama is a Professor of Innovation and Technology Management in the College of Commerce and Graduate School of Business Administration at Nihon University. Prior to joining Nihon University, he has been working as a marketer and planning engineer at KDDI, NTT and NTT DoCoMo. He holds the B.S., M.S. and Ph.D. degrees in electrical engineering from Waseda University, Tokyo, Japan. He has published six books including *Boundary Management — Developing Business Architecture For Innovation* (Springer, 2009), *Innovation Networks In the Knowledge-based Firms* (Edward Elgar Publishing, 2009), *Knowledge Innovation — Strategic Management As Practice* (Edward Elgar Publishing, 2007), *New Knowledge Creation Through ICT Dynamic Capability — Creating Knowledge Communities Using Broadband* (Information Age Publishing, 2008), *The Strategic Community-based Firm* (Palgrave Macmillan, 2007), *Knowledge Innovation — Strategic Management As Practice* (Edward Elgar Publishing, 2007), *Project-based Organization In The Knowledge-based Society* (Imperial College Press, 2007).

He has also published over 80 refereed papers in the area of business and management (*Organization Studies, Journal of Management Studies, Long Range Planning, Strategy and Leadership, Technovation, Systems Research and Behavioral Science, etc.*), information systems and management (*Information Systems Management, International Journal of Information Management, Information Management and Computer Security Business Process Management Journal, International Journal of Management and Enterprise Development, etc.*), telecommunications (*International Journal of Electronic Business, International Journal of Mobile Communications, etc.*) and solid state electronics (*IEE Electronics Letters, Solid-State Electronics, Journal of Electrochemical Society, Physica Status Solidi, etc.*). Especially, he received the R&D 100 Awards 2003 from *R&D Magazine* (U.S.).