

UNIVERSIA BusinessReview

Knowledge, Entrepreneurship, and Capabilities: Revising the Theory of the MNE

David J. Teece & Abdulrahman Y. Al-Aali

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NÚMERO 40 UNIVERSIA BUSINESS REVIEW

El presente número monográfico está dedicado al análisis del papel del **Conocimiento y la Innovación en la Estrategia Empresarial, *Knowledge, Strategy and Innovation in the Firm***. En este han participado destacados profesores e investigadores de nivel internacional en el ámbito de la dirección del conocimiento y la innovación, muchos de los cuales forman parte del Comité Científico del Nonaka Centre for Knowledge and Innovation de CUNEF, en España. Este Centro, inaugurado en noviembre de 2011 por su Presidente Honorífico el Profesor Ikujiro Nonaka, centra sus actividades en la formación e investigación en la Dirección del Conocimiento, la Innovación y la Estrategia Empresarial. Este número monográfico ha sido posible gracias a la colaboración honorífica del profesor **Ikujiro Nonaka** y al trabajo de los profesores de la Universidad Complutense **María Ángeles Montoro-Sánchez** y **Gregorio Martín-de Castro**, ambos miembros del Comité Ejecutivo del Nonaka Centre for Knowledge and Innovation. El Comité de Dirección y el Comité Científico de UBR desean agradecer el magnífico trabajo realizado por ellos en la coordinación editorial, identificando a los autores, realizando los procesos de revisión y aceptando los trabajos que reúnen los requisitos establecidos por la revista.

Los siete artículos que componen este número monográfico realizan un recorrido teórico y presentan casos empíricos específicos sobre las principales cuestiones que siguen siendo fuente de debate actual para la justificación y desarrollo de la empresa: el conocimiento, la innovación y la estrategia. Estos trabajos permiten constatar las claves de la estrategia empresarial, la relevancia de la innovación y sus fuentes vinculadas, así como la necesidad de seguir completando los fundamentos teóricos con nuevas visiones, donde no solo el conocimiento es un elemento más para la existencia y supervivencia de las empresas. A la vista de los resultados el número especial de la Revista es, sin duda, un número donde los directivos y empresarios tienen la oportunidad de ver y constatar la utilidad de la investigación universitaria.

En el primer artículo de este número, los profesores **David Teece** de University of California, Berkeley en EE.UU. y **Abdulrahman Al-Aali** de King Saud University en Saudi Arabia, realizan una disquisición teórica sobre la empresa multinacional. Partiendo del paradigma ecléctico, los autores proponen cómo los conceptos capacidades dinámicas, gestión del conocimiento y emprendimiento ayudan a una mejor comprensión del fenómeno de las empresas multinacionales. El trabajo finaliza con una serie de implicaciones directivas para la empresa multinacional.

Los profesores **Paul Adler** de University of Southern California en EE.UU. y **Charles Heckscher** de Rutgers University en EE.UU. proponen en el siguiente artículo un nuevo tipo de organización en la empresa, la denominada comunidad colaborativa que permite a las empresas en el actual entorno complejo y dinámico lograr altos niveles de resultados

tanto en la denominada exploración como en la explotación, logrando la ambidestreza. El nuevo tipo de organización, –el modelo colaborativo– combina las formas organizativas mecanicistas y orgánicas, requiriendo de un nuevo tipo de confianza colaborativa, además de una serie concreta de valores, normas y sistema de autoridad. Los autores finalizan el artículo ilustrando el caso de la empresa estadounidense de salud Kaiser Permanente.

Partiendo de las preguntas planteadas en 1937 por Ronald Coase sobre la existencia de las empresas, sus límites y mecanismos de coordinación, el profesor **J.C. Spender** de ESADE en España, retoma con su artículo el debate aún no cerrado de estas cuestiones entre economistas e investigadores de organización y dirección de empresas. No sólo plantea críticas sino también nuevos interrogantes, y destaca el papel del contexto, la imaginación y el juicio para poder acotar y dar respuesta a estas cuestiones.

El trabajo del profesor **Hiroataka Takeuchi** de Harvard University en EE.UU. proporciona una revisión del pensamiento actual de la visión de la estrategia basada en el conocimiento. Dado que las empresas difieren unas de otras, no sólo en actividades, recursos y competencias, sino por las diferentes visiones que del futuro tienen las personas que deciden e implantan su estrategia empresarial, es necesario tener en cuenta todo esto a la hora de analizar la estrategia que siguen. Este trabajo presenta cómo la visión de la estrategia basada en el conocimiento complementa las aportaciones de las escuelas clásicas de pensamiento sobre de estrategia especialmente en aspectos relacionados al papel de las personas como centro de la estrategia, la consideración de la estrategia como un proceso dinámico y por su agenda social.

En el siguiente artículo, el profesor **Stephen Tallman** de University of Richmon en EE.UU., estudia las alianzas y la localización en clusters industriales como nuevas formas de acceso a conocimiento externo. Dado que las empresas están dispersado las actividades que les generan valor a lo largo del planeta y subcontratándolas a través de alianzas cada vez más, las fuentes externas de conocimiento son cada vez más importantes para éstas. Este artículo hace un recorrido por los principales temas de investigación relacionados con las redes de alianzas y su localización en clusters industriales, como fuentes externas de acceso a nuevo conocimiento.

Por su parte, el profesor **Robert M. Grant** de Bocconi University en Italia, ofrece evidencia empírica de la gestión del conocimiento en la empresa a través de un amplio estudio de caso múltiple en el sector de hidrocarburos internacional. Los resultados de este estudio muestran dos formas bien diferenciadas de entender y llevar a cabo la práctica de la gestión del conocimiento en las actividades de negocio. Se evidencia, por un lado, la aplicación de las tecnologías de la información y las comunicaciones en la gestión del conocimiento explícito, y por otro lado, el uso de técnicas de gestión del conocimiento cara a cara que facilitan la transferencia de conocimiento explícito.

Los profesores **Gregorio Martín-de Castro** y **María Ángeles Montoro-Sánchez**, ambos de la Universidad Complutense de Madrid y del Centre for Knowledge and Innovation

“Nonaka Centre” de CUNEF en España, realizan, a modo de síntesis, una revisión de las principales aportaciones teóricas realizadas sobre el liderazgo y el contexto organizativo. Términos como el liderazgo distribuido o sabio, *ba*, capital social o contexto colaborativo son analizados y puestos en valor. El trabajo propone un nuevo enfoque de investigación, denominado configurativo, que pone énfasis en el estudio de fenómenos complejos en las ciencias sociales, donde la causalidad raramente se presenta de forma aislada y donde el análisis conjunto de las condiciones causales ofrecen un mayor poder explicativo. Dicho enfoque se propone como una nueva tendencia de investigación con grandes expectativas en la gestión del conocimiento y la innovación.

Con este número esperamos ser capaces de conseguir que empresarios, directivos y académicos encuentren aportaciones útiles en cada uno de sus ámbitos, de forma que toda la comunidad empresarial y académica pueda intercambiar conocimientos sobre la administración de empresas que es clave para el desarrollo de nuestras sociedades.

Agradezco el trabajo de los editores del número especial María Ángeles Montoro-Sánchez y Gregorio Martín-de Castro, la contribución de los autores, profesores del reconocido prestigio internacional e investigadores representativos en el ámbito del conocimiento, la innovación y la estrategia, así como el esfuerzo de los evaluadores que con su desinteresada colaboración han hecho que este número cumpla los estándares exigidos en UBR. Por ello, les animo a leer los artículos.



Álvaro Cuervo

Director de Universia Business Review

LETTER FROM THE EDITOR-IN-CHIEF NUMBER 40 UNIVERSIA BUSINESS REVIEW

This special issue of *Universia Business Review* is devoted to the role played by knowledge and innovation in strategic management. **'Knowledge, Strategy, and Innovation in the firm'** is a special issue in which leading knowledge and innovation management scholars have participated. Some of them are members of the Scientific Committee of the Nonaka Centre for Knowledge and Innovation of CUNEF Business School in Madrid. This Centre, which was inaugurated in November 2011 by its Honorary President Professor Ikujiro Nonaka, focuses its activities on Knowledge Management, Innovation and Firm Strategy research and training.

This special issue has been possible thanks to the honorary collaboration Professor **Ikujiro Nonaka** and the work Professors **María Ángeles Montoro-Sánchez** and **Gregorio Martín-de-Castro**, both of Complutense University of Madrid, and members of the Executive Board of the Nonaka Centre for Knowledge and Innovation. The Scientific and Executive Boards of *Universia Business Review* would like to acknowledge the fantastic work done in editing the special issue, contacting the authors and managing the review process and accepting papers that fit the academic requirements of the journal.

The seven articles that comprise this special issue provide theoretical reviews and case studies on the main issues in the debate on the firm's existence and development: knowledge, innovation, and strategy. These papers address the basis of firm strategy, the important role of innovation and its related sources, as well as the need to further theoretical foundations with new visions, where knowledge is an important element of the firm's existence and survival. Looking at the content of the special issue, practitioners, entrepreneurs, and managers will have the opportunity to see and verify the value of academic research.

In the first article Professors **David Teece** of University of California at Berkeley in the US and **Abdulrahman Y. Al-Aali** of King Saud University in Saudi Arabia, provide a theoretical analysis on the multinational enterprise. Taking the eclectic paradigm as the starting point, the authors explain how the concepts of dynamic capabilities, knowledge management, and entrepreneurship provide a better understanding of the multinational enterprise. The paper concludes with a set of managerial implications for multinational enterprises.

Professors **Paul Adler** of University of Southern California in the US and **Charles Heckscher** of Rutgers University in the US, propose in the next article a new type of organizational form called collaborative community that enables a firm in a complex and dynamic environment achieve high levels of performance in both exploration and exploitation, achieving ambidexterity performance. The new type of organization –the collaborative model– combines mechanistic and organic organizational forms, requiring

a new type of trust –collaborative trust– jointly with a specific set of values, norms and authority system. The authors conclude the paper with the case of the U.S. health company Kaiser Permanente.

Taking the issues introduced in 1937 by Ronald Coase on the existence, limits and coordination mechanisms of firms as the starting point, Professor **J. C. Spender** of ESADE in Spain, returns to the ongoing debate of these issues among management and economic researchers. He not only provides a criticism but also raises new questions, and highlights the role of context, imagination, and judgment to delimitate and respond to these issues.

The article of Professor **Hiroataka Takeuchi** of Harvard University in the US, provides a review of current thinking on the Knowledge-Based View of the Firm. Firms differ from each other, not just in business activities, resources and competences, but also in the different visions on the future of the people who decide and implement strategy. It is necessary to take into account all these issues in order to analyze the strategy pursued. This paper explains how the knowledge-based view complements the contributions of the classical schools of thought on strategy and, especially, on aspects related to the role of people as the core of the strategy, the consideration of strategy as a dynamic process, and the firm's social agenda.

In the next article, Professor **Stephen Tallman** of University of Richmond in the US, studies alliances and location in clusters as new forms of access to external knowledge. Given that firms are increasingly dispersing their value-added operations around the globe and outsourcing them to alliances, external knowledge sources are becoming increasingly important. This paper reviews the main research topics related to alliance networks, as well as their location in clusters as external sources to access to new knowledge.

Professor **Robert M. Grant** of Bocconi University in Italy, provides empirical evidence on knowledge management via a multiple case study in the international oil industry. He shows two main ways of understanding and implementing knowledge management in business activities. The paper illustrates on the one hand the application of information and communication technologies in the management of explicit knowledge and, on the other hand, the use of knowledge management techniques to facilitate face-to-face explicit knowledge transfer.

Professors **Gregorio Martín-de Castro** and **María Ángeles Montoro-Sánchez**, both of Complutense University of Madrid and Nonaka Centre for Knowledge and Innovation of CUNEF Business School in Spain, review the main theoretical issues on leadership and organizational context. Terms such as distributed or wise leadership, *ba*, social capital or collaborative context are analyzed and integrated. This paper proposes a new research framework, called configurational, which emphasizes the study of complex phenomena in social sciences, where causality is rarely presented in isolation, and where the co-joint analysis of causal conditions offer greater explanatory power.

With this special issue we hope that entrepreneurs, managers and scholars find

useful the contributions made in each of their areas. This will help the practitioner and academic communities share knowledge on business management, which is key for the development of our society.

I would like to acknowledge the editorial work of Professors María Ángeles Montoro-Sánchez and Gregorio Martín-de Castro, the contributions by the authors of this issue, all worldwide recognized professors and researchers in the field of knowledge, innovation and strategy in the firm, as well as the work of reviewers, who with their generous collaboration have made possible this special issue fulfills the standards required by UBR. I encourage you to read this special issue.

A handwritten signature in dark ink, appearing to read 'Álvaro Cuervo', with a stylized, looped initial 'A' and a horizontal flourish at the end.

Álvaro Cuervo
Editor-in-Chief Universia Business Review

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Universia Business Review no es una publicación exclusiva del mundo académico en sentido estricto, sino que su misión principal es **trasladar a quienes tienen la responsabilidad de dirigir empresas y negocios las ideas y desarrollos más innovadores que el ámbito científico y académico sea capaz de generar.**

Por otro lado, *Universia Business Review* no renuncia a dar servicio a la comunidad universitaria y científica como la publicación de referencia, en la que los especialistas puedan efectuar un seguimiento sistemático de las aportaciones novedosas de los colegas de su misma especialidad. En particular, esta revista pretende ser un vehículo de unión y comunicación de las comunidades universitarias de habla latinoamericana dedicadas al estudio de la Empresa.

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Los originales recibidos y admitidos por el Comité de Dirección, serán enviados al Editor Asociado del área correspondiente para que analice si el trabajo debe continuar el proceso editorial y ser remitido a dos evaluadores anónimos (expertos ajenos a la entidad editora), de reconocido prestigio en el campo de estudio. Para desarrollar su labor se le envía el listado de evaluadores de los últimos años, pudiendo seleccionar e incluir aquellos nuevos revisores que el Editor Asociado considere más acorde con el trabajo para su evaluación. Los evaluadores estarán asignados a un área, aunque por el tema objeto de estudio puedan desarrollar su labor en otras. En estos casos se debe tener cuidado para no cargar excesivamente de trabajo a un evaluador.

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Una vez dado el visto bueno al trabajo, dicho anexo no se incorporaría en el artículo editado. Los autores deben hacer un esfuerzo para adaptar su trabajo a nuestros lectores, a los empresarios y directivos, no sólo al mundo académico.

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Knowledge, Entrepreneurship, and Capabilities: Revising the Theory of the MNE*

Conocimiento, emprendimiento y capacidades:
Revisando la teoría de la Empresa Multinacional

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I. INTRODUCTION

A fundamental academic question in economics is why the multinational enterprise (MNE) exists at all. In theory, everything that a multinational might do can be replicated by domestic firms linked through a network of global contracts. In practice, of course, we see a full range of cross-border activity, from arm's-length licensing through joint ventures to direct investment, conducted by relatively integrated business enterprises. In other words, there is greater reliance on internal organization than an abstract contract-based analysis might predict.

That is not to say that alliances and contractual relationships are not ubiquitous. To the contrary, they are exceedingly common. Indeed, cross-border networks have become more dense and complex over the past two decades as opportunities have become more global.

Meanwhile, organizational capabilities have become not only more widely dispersed but also more specialized. MNE specialization is enabled and required by cheaper transportation and telecommunications that enable direct access to global sources of goods and services. This specialization is coupled with the outsourcing of many "non-core" activities.

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EXECUTIVE SUMMARY

The paper begins by briefly presenting the “eclectic” perspective on the multinational enterprise (MNE), then shows how the addition of the concepts of entrepreneurship, knowledge management, and dynamic capabilities provides a more useful set of variables for theorizing about the MNE. The normative conclusion advanced is that entrepreneurial management, knowledge awareness, and strong dynamic capabilities are necessary to sustain superior MNE performance in fast-moving global environments.

RESUMEN DEL ARTÍCULO

El artículo comienza con una breve presentación de la perspectiva “ecléctica” de la empresa multinacional (MNE). Posteriormente se presentan conceptos adicionales como emprendimiento, gestión del conocimiento y capacidades dinámicas que proporcionan un conjunto de variables que sirven para construir teoría sobre la MNE. Las conclusiones avanzan que la gestión emprendedora, la constancia del conocimiento como recurso, y unas capacidades dinámicas fuertes son elementos necesarios para lograr resultados superiores sostenidos por parte de las MNE en entornos dinámicos y globalizados.

The performance of these functions involves entrepreneurial managers, knowledge creation, and dynamic capabilities—all concepts that are absent from most economic analysis, and even some business analyses, of the MNE

The typical MNE today displays common asset ownership across national borders embedded within a dense network of alliances. Put differently, the dominant MNE organizational model is a blend of cross-border integration and contracts.

The effective management of cross-border activity both inside and outside the firm requires an understanding of the essence—i.e., the essential functions—of the multinational enterprise. The performance of these functions involves entrepreneurial managers, knowledge creation, and dynamic capabilities—all concepts that are absent from most economic analysis, and even some business analyses, of the MNE.

The paper begins by briefly reviewing the mainstream “eclectic paradigm” of the MNE. Important gaps in the paradigm are then discussed, including entrepreneurship, knowledge management, and capabilities. Some management implications of the capabilities-enhanced approach to the MNE are then discussed.

2. THE ECLECTIC (OLI) PARADIGM

One of the leading frameworks for explaining the activities of the multinational enterprise (MNE) is John Dunning’s “eclectic paradigm” (Dunning, 1981, 1995). It is often described by the acronym OLI, which stands for three groups of factors: ownership, location, and internalization.

“Ownership” factors are features of the firm. Successful firms have unique assets that give them an advantage in their home country, and these assets may be advantageous in other countries as well.

The relevant assets will most likely be intangible, such as an internationally known brand or the capacity to rapidly develop and produce new products. Such assets need to be “built”—a slow process, but one which results in an asset that is hard for others to imitate.

Unlike many physical assets, some intangibles can be transferred (replicated) and applied in new contexts, such as a different country, without incurring all over again the costs of creating the asset. The classic example is a trade secret, the use of which in two countries rather than one does not require duplicating the research and development investment that went into its creation. However, technology transfer is generally not costless.

“Location” factors are features of the host or home country, such as

the cost and skills of workers in particular locales. Differential learning places locations on different learning paths, producing peaks on today's "rugged" global industrial landscape, which is considered "flat" only at risk of missing crucial differences (Levinthal, 1997). Advantages that flow from locating activities in specific business environments are increasingly important to many MNEs (see, e.g., Cantwell and Mudambi, 2005).

Host country factors that might justify an initial direct investment cannot, however, generally provide a sustainable competitive advantage since they are equally accessible to other firms. Exceptions can occur in certain cases, such as when the enterprise has a privileged relationship with local government.

"Internalization" factors are those that pertain to firms operating in specific industries with distinct patterns of transaction costs. All markets involve transaction costs, which Williamson (1975) defines as the costs of organizing the economic system. This includes costs that result when one party, knowing important information that the other party does not, engages in ex post opportunism. The costs of such hazards are likely to be particularly high when transactions occur in thin markets between entities in different countries.

When a company goes abroad, it has the choice between investing directly to create a physical presence, contracting with a local firm by licensing its trademark and/or its technology, or some intermediate arrangement such as a joint venture. One criterion for the choice—the only criterion in some theories—is the minimization of transaction costs. When direct investment is chosen, the transaction is said to have been internalized (Buckley and Casson, 1976).

However, internalization can be motivated by reasons other than transaction costs. It may be easier and cheaper to transfer technology and capabilities internally not because of high transaction costs and contractual risks, but because it is in fact easier to transfer and deploy resources internally—especially when entrepreneurship and learning are significant activities required to complete the task at hand (Teece, 1976). The transfer of capabilities and the development of markets, require entrepreneurial organization. In our view, the choice to invest abroad (rather than partner) is not driven as much by the need to reduce contractual hazards as by the need to align incentives and pursue a common (shared) vision, thereby lowering technology transfer costs and helping to get organizational tasks completed.

KEY WORDS

Multinational enterprises, dynamic capabilities, entrepreneurship, intangible assets, knowledge management

PALABRAS CLAVE

Empresas multinacionales, capacidades dinámicas, emprendimiento, activos intangibles, dirección del conocimiento

Both explanations (contract-based and capability-based) for internalization are important. The capabilities branch, however, has received relatively little attention and is not usefully squeezed into a transaction cost framework (Teece, 1982).

3. ENTREPRENEURSHIP AND MARKET CREATION

Entrepreneurship, which can refer either to the activity of founding a new company or of initiating new activities within an existing enterprise, is typically overlooked in discussion of MNEs. In fact, most economic theories of the firm, multinational or otherwise, make the implicit assumption that all opportunities are known and addressed. However, research suggests that the identification of opportunities, especially across borders, depends on both chance and skill. Addressing them is by no means straightforward either.

There are a number of subtly different definitions of entrepreneurship, but they generally involve two stages. First comes the identification of a demand that is unsatisfied. This may involve technology that has emerged from a speculative R&D program, or it may require technology that doesn't yet exist. The second stage is taking the steps needed to satisfy the demand. Thus, the entrepreneur (or entrepreneurial manager) is, in a sense, creating the future (Kirzner, 1985).

The very essence of cross-border entrepreneurial activity is that it creates—or at least shapes—markets abroad by identifying latent demand, leveraging resources wherever they may be located, and launching new products. Performing these tasks well requires charismatic, cross-cultural, and adaptive leadership, deep knowledge of local markets, and a clear understanding of the technical, physical, and human constraints at hand.

Cross-border activity can occur if entrepreneurs and entrepreneurial managers take new knowledge and help commercialize it at home and abroad. They learn about internal and external resources in multiple geographies, arbitrage when possible, and create them when necessary. Because the market for knowledge about new opportunities isn't well developed, entrepreneurs and managers must build organizational capabilities inside their firms to assist in the generation of this type of knowledge (Teece, 1981; Gans and Stern, 2010). It is by no means clear that an account of this kind is best squeezed into a transaction cost economics framework. The problems aren't primarily contractual. Rather, they are associated

with identifying valuable capabilities developed in one market, which could be at home or abroad, and then deploying them globally.

In this framework, the “entrepreneur” need not be a single person. Instead, entrepreneurship, even in new ventures, can be thought of as a social process that emerges from the top management team and, to varying extents, from elsewhere in the organization (Foss et al., 2008). These processes can be replicated abroad to create (and capture) value.

Once an entrepreneurial firm sees the possibility of satisfying a latent demand or creating an entirely new market in a host country, the ownership, location, and internalization factors will determine whether the new business requires direct investment or a less resource-intensive mode of entry. Entrepreneurship provides a more complete explanation for the activities of the MNE than does the eclectic paradigm (OLI) alone.

4. KNOWLEDGE CREATION AND MANAGEMENT

The eclectic paradigm coupled with entrepreneurship theory would appear to “explain” instances of foreign direct investment. They do not, however, fully explain the strength and coherence of the multinational enterprise on an ongoing basis. One key to understanding the long-run sustainability of the MNE is how it creates, utilizes, protects, and transfers knowledge.

Early views of knowledge in the enterprise were very limited. During the height of managerial capitalism in the early- to mid-twentieth century, knowledge management advocates counseled recording and quantifying as much as possible. Beginning in the 1960s, attention was increasingly paid to the importance of R&D as a source of new opportunities, but this was seen as a largely distinct function (the R&D department).

Nonaka (1991) described knowledge creation as an ongoing process embedded throughout the enterprise. Subjective tacit knowledge held by individuals is externalized and shared. New knowledge, much of which may remain tacit, is socially created through the synthesis of different views.

In Nonaka’s conception of the firm, knowledge keeps expanding through the socialization-externalization-combination-internalization (SECI) process. The process must be guided by the company’s vision for what it wants to become and the products it wants to produce. This vision of the future must go beyond goals defined



by financial metrics alone. Good leaders can accelerate the SECI process and make it more productive by creating a corporate identity that employees find attractive.

In the SECI process, individual knowledge is shared within a team that has taken the time to build trust. Together, the team develops “new perspectives created from shared tacit knowledge” (Nonaka, 1994: 25), which it then “crystallizes” into an output (e.g., a product concept). Upper management must then screen the output for consistency with corporate strategy and other standards.

Middle managers are the bridge that connects the visionary ideals of top management and the chaotic realities of front line workers. Middle managers bear responsibility for solving the tensions between things as they are and the changes required for top management’s vision to be realized. The employees working on the middle manager’s team are the actual creators of new knowledge (Nonaka, 1994).

This model, which Nonaka (1988) calls “middle-up-down management”, puts middle managers in the most entrepreneurial role. The task of top management in this model is to challenge and inspire. It is then up to middle managers to lead teams whose members are drawn from different functional perspectives to engage in the give-and-take of knowledge creation, such as product development. The teams that they lead must be given autonomy to achieve their goals within the limitations of time-to-market and other requirements.

At the heart of the SECI process is the conversion of personal tacit knowledge to new, collectively constructed concepts. This is different from codification as conventionally understood, i.e., the simple documentation of personal knowledge.

Similarly, knowledge management must go beyond discrete facts that can be stored in databases or on intranets. Facts are information, but not necessarily knowledge.

Nonaka’s conception of knowledge is deeply rooted in individual experience. Shards of knowledge cannot be isolated in a database to be later recombined into something useful. Individual knowledge, in order to be useful to the enterprise, must be captured as part of building a collaborative commitment to a shared vision, with databases playing a supporting role. At Seven-Eleven Japan, for instance, front-line employees are trained to build hypotheses about what customers at their store want, and their hypotheses can be sharpened by consulting historical data from an extensive internal



system that contains not only point-of sale data and recommended product displays but also connects to company headquarters and to manufacturers (Nonaka and Toyama, 2007). The information in the database is a support for the knowledge of the employees.

5. DYNAMIC CAPABILITIES AND (SUSTAINABLE) MNE COMPETITIVE ADVANTAGE

The potential of the enterprise for knowledge creation and management takes us part way to understanding the MNE. The continued existence of the enterprise also requires commercial success. The dynamic capabilities framework in strategic management provides this final piece of the puzzle. Knowledge must be combined with good strategy and strong dynamic capabilities to capture value.

The concepts of organizational resources and capabilities (a type of resource) were developed in the strategic management literature during the 1980s. Dunning began the task of incorporating dynamic capabilities into the eclectic paradigm in some of the last work published before his untimely death (Dunning and Lundan, 2010). But his paradigm has little in the way of explanation for the origins of firm-level asset ownership and capability advantages, nor how to renew these advantages as the business environment evolves. The dynamic capabilities framework uses an integrative approach that encompasses entrepreneurship, ownership advantages, knowledge creation, and sustained advantage.

The foundations of dynamic capabilities can to some degree be traced back to Penrose (1959), who argued that a firm's resources were applicable to more than one line of business and could be realigned to help the firm expand and diversify. Penrosean insights laid the foundation for the Resource-Based View of the firm, which focuses on possessing and utilizing fungible resources that meet the VRIN criteria (Valuable, Rare, Inimitable, and Non-substitutable) as the main mechanism for the generation of profits.

However, the resources approach, like the eclectic paradigm, is weak in explaining how firms develop or acquire new capabilities and particularly how they adapt when circumstances change. The dynamic capabilities framework looks beyond the benefits of owning valuable resources and emphasizes a firm's capacity to deploy its resources, adjust them as circumstances require, and generate or acquire new ones when needed.

5.1. Ordinary capabilities

It is perhaps easiest to understand what dynamic capabilities are by juxtaposing them against ordinary capabilities. Ordinary capabilities are used by an enterprise to produce and sell a defined (and static) set of products and/or services. They include operational competences and the planning and coordination processes for activities such as optimizing task performance, choosing a human resources approach, and selecting a composition for the board of directors.

Ordinary capabilities are unlikely to provide a basis for long-run competitive advantage outside of undeveloped and emerging economies. Knowledge about optimizing administrative and operational activities is largely explicit, and ordinary capabilities can generally be calibrated against the best practices of other firms. In a mature industry like autos, for example, productivity in areas such as procurement, manufacturing, and wholesale is similar across firms, at least in the developed countries (Lutz, 2011).

In certain locations, a firm may prosper for a while with strong ordinary capabilities but weak dynamic capabilities. In practice, environments with low competition, such as countries where tariff barriers keep out strong foreign competitors, are good candidates. The challenge comes when there is rapid change due to technological progress or other sources of hyper-competition (D'Aveni et al., 2010). By definition, weak dynamic capabilities mean that the firm is unable to adapt well to a new business environment.

MNEs are generally good at transferring their management practices to all countries where they operate (Bloom et al., 2012), and ordinary capabilities at home may for a while be distinctive abroad. The early overseas success of McDonald's Corp. was in part due to its ability to transfer its considerable ordinary capabilities (Luo, 2000).

The rise and fall of Japan is perhaps in large part a capabilities story. Japanese firms rose to global dominance in many industries on the strength of their ordinary capabilities, developed by employing learning processes that resulted in operational excellence. They were generally able to transfer and adapt these capabilities for overseas production as needed. Over time, however, rivals of Japanese companies in autos, semiconductors, and other industries have not only learned to challenge Japanese quality and efficiency, they have also out-innovated Japan, particularly in the development of new products and business models. The large Japanese firms have proved unable to realign their activities in keeping with the

shifting business environment, that is, they have proved to have weak dynamic capabilities.

5.2. Dynamic capabilities

Ordinary capabilities, as we have seen, are about doing things right. They involve efforts to optimize within certain fixed constraints. Dynamic capabilities, on the other hand, are about doing the “right” things. This requires assessing technological and business opportunities, forecasting the business environment, adjusting organizational design when necessary, and acting at the right time. The ability to deploy, or redeploy, resources in alignment with the necessary complementary assets is a key underpinning. The good judgment and deep wisdom of the top management team is another key to strong dynamic capabilities.

Dynamic capabilities are thus higher-order capabilities that help characterize how an organization develops strengths, extends them, synchronizes business models with the business environment, and/or shapes the business environment in its favor. They result from some combination of superior top management skills and organizational routines (Teece, 2007). The dynamic capabilities framework emphasizes the need for management to be able to continuously align people, processes, and assets to satisfy consumer desires and achieve strong financial performance. Strong dynamic capabilities in the service of good strategy can deliver long-term profitability and growth.

The dynamic capabilities perspective goes beyond a financial-statement view of the firm’s assets to emphasize management’s abilities to orchestrate resources both inside and outside the firm at home and abroad. External linkages that must be leveraged to carry out a plan are increasingly common in the global economy, including suppliers, strategic alliances, university researchers, and business ecosystems. The MNE must identify, establish access or control, and then coordinate all the complementary assets that are needed to deliver the company’s products and services (Teece, 1986).

Unlike ordinary capabilities, dynamic capabilities are particularly difficult to transfer across borders because they are tacit and often embedded in a unique set of relationships and histories. Cultural differences will need to be accounted for since sensing new market opportunities requires capabilities in multiple geographies. This is not usefully thought of in transaction cost terms.



For purposes of operationalizing the framework, dynamic capabilities can be disaggregated into three clusters of processes and managerial activities conducted inside firms: (1) identification and assessment of opportunities at home and abroad (*sensing*), (2) mobilization of resources globally to address opportunities and to capture value from doing so (*seizing*), and (3) continued renewal (*transforming*). Sensing is the most entrepreneurial of the three clusters, whereas seizing is dominated by more basic managerial concerns. Transforming places a premium on leadership.

Sensing involves exploring technological possibilities, probing markets, listening to customers, and scanning the business environment. Entrepreneurial managers need to construct and test hypotheses about the market in order to identify unsatisfied demand. In the MNE context, it is critical that sensing activities are embedded throughout the company. Management must open channels that allow intelligence (not simply data) to flow from the farthest reaches of the organization toward the top management team to facilitate localization of the company's products and services. Starbucks, for example, has adapted its presentation in China, where coffee is less popular than in Western countries, by creating attractive spaces where people can hold informal business meetings and enjoy non-coffee beverages or China-specific sandwiches such as a "Hainan chicken and rice wrap" (Burkitt, 2012). Knowledge must also be able to flow laterally across subsidiaries.

Once opportunities are sensed, they can be seized. This requires the formulation of a strategy that sets a path forward. Strong dynamic capabilities enable the firm to flesh out the details around the new strategic intent and implement the strategic actions quickly and effectively by designing business models to satisfy customers, and securing access to the necessary capital and human resources. But strong dynamic capabilities can become worthless if they are tied to a poor or badly misjudged strategy.

Transformation of the enterprise is called for when internal and external circumstances shift. Transformation capabilities include selectively phasing out old products, renovating older facilities both domestically and globally, and changing business models, methods, and even organizational culture. Transformational capabilities are needed most obviously when radical new threats and opportunities are to be addressed. But they are also needed periodically to soften the rigidities that develop over time from asset accumulation and the

development of standard operating procedures.

In fact, in established MNEs, sensing, seizing, and transforming are ongoing processes. The MNE may find itself emphasizing different clusters of capabilities in different geographic markets. For example, Yum Brands, the owner of fast-food brands KFC, Taco Bell, and Pizza Hut, has simultaneously engaged in rapid expansion (seizing) in China and in retrenchment and transformation in one of its established markets, the United Kingdom.

Transformation requires unusual leadership skills to help the organization deal effectively with path dependencies and other structural rigidities. Complementarities need to be managed to avoid creating major new problems when addressing old ones. Organizational rigidities make this process difficult; organizational transformations are accordingly risky. IBM is an example of a successful transformation, having changed from a hardware company into an “on-demand” services provider under outsider CEO Lou Gerstner from 1993 to 2002 (Harreld et al., 2007).

6. MANAGERIAL IMPLICATIONS FOR THE MNE

A robust “theory” of the MNE that encompasses entrepreneurialism, knowledge management, and, especially, capabilities has numerous implications for the management of these firms. Some applications of the framework will be discussed here. These include the decisions about entry into new markets, knowledge transfer, and the relationship between headquarters and subsidiaries. Indeed, it is suggested that there is a far broader array of issues in international management that can be understood from a capabilities perspective than from a pure transaction cost economics approach to the MNE. When an MNE senses a new opportunity in a foreign market, it must first assess its own capabilities. Does it already possess the necessary capabilities? Does it have experience transferring capabilities to other contexts? Does it have ready access to local knowledge in the host country? Can it achieve meaningful replication abroad of its capabilities at home?

When speed is of the essence and/or certain capabilities are absent, a joint venture or alliance with a host country partner is likely to be preferred, provided the MNE’s key advantages can be leveraged and protected within the relationship. When they are well managed, joint ventures and alliances can reduce financial outlays and improve the MNE’s access to specialized local capabilities.

Strong dynamic capabilities are needed to transform the existing MNE resources into a suitable match with the host country environment and/or transform the host country market itself to build receptivity to the MNE's product offering. Transformation also comes into play in the creation of internal structures that establish cross-border control and two-way information flows. A plethora of cross-boundary organizational processes will need to be employed. A transaction cost approach has little to say about these activities.

Once the entry decision is made, knowledge transfers will be required. The initial transfers may include routines associated with efficient manufacturing of the company's products, personnel management, and other operational capabilities.

Unless the MNE has already replicated its systems of productive knowledge in other markets, the act of replication for even ordinary capabilities is likely to be costly (Teece, 1976). New learning may be required because the skills and know-how that the MNE uses to undergird its ordinary capabilities in one geographic context might not quite fit in another.

Not only are some capabilities (and the routines upon which they rest) difficult to replicate, but even understanding which elements (routines, skills, know-how) are relevant to a particular capability may not be straightforward. Some sources of a firm's advantage are so complex that the firm itself does not fully understand them (Lippman and Rumelt, 1982).

Once entry and initial knowledge transfer have been effectuated, the MNE must design the relationship between headquarters and subsidiary. The knowledge-conscious MNE allows considerable autonomy to region/country managers, with incentives that support local discovery and local learning. Subsidiary managers should be encouraged to generate entrepreneurial insights and intangibles adapted to local conditions. These can potentially later be transferred to the parent or adapted directly by other business units (e.g., Birkinshaw and Hood, 1998).

Knowledge creation can even be encouraged among front-line employees. Swedish construction firm Skanska, for example, has a competitive grant program that encourages managers and workers to propose new apps for use on the tablet computers that have been issued to workers in the field. Winning proposals, such as an app for leak detection, are then commissioned to an external developer and deployed in the field (Schechtman, 2012).



The MNE's headquarters can enhance the firm's capabilities by promoting organizational learning, managing complementarities, and supporting technology transfer across divisions. Headquarters provides a guiding vision and culture, performs global asset orchestration, and ensures the availability of financial resources. There is of course much more to managing the MNE. However most problems in international management will be illuminated by an awareness of the importance of entrepreneurial management, knowledge creation, and dynamic capabilities.

REFERENCES

- Birkinshaw, J.; Hood, N. (1998): "Multinational subsidiary evolution: Capability and charter change in foreign-owned subsidiary companies", *Academy of Management Review*, Vol. 23, num.4, pp. 773–795.
- Bloom, N.; Genakos, C.; Sadun, R.; Van Reenen, J. (2012): "Management practices across firms and countries", *Academy of Management Perspectives*, Vol. 26, num.1, pp.12–33.
- Buckley, P. J.; Casson, M. C. (1976): *The future of multinational enterprise* Macmillan: London.
- Burkitt, L. (2012): Starbucks plays to local Chinese tastes. *WSJ.com* (Wall Street Journal). November 26. <http://professional.wsj.com/article/SB10001424127887324784404578142931427720970.html>
- Cantwell, J. A.; Mudambi, R. (2005): "MNE competence-creating subsidiary mandates", *Strategic Management Journal*, Vol. 26, num. 12, pp. 1109–1128.
- D'Aveni, R.; Dagnino, B. G.; Smith, K. G. (2010): "The age of temporary advantage", *Strategic Management Journal*, Vol. 31, num. 13, pp. 1371–1385.
- Dunning, J. (1981): *International production and the multinational enterprise*, Allen & Unwin: London.
- Dunning, J. (1995): "Reappraising the eclectic paradigm in the age of alliance capitalism", *Journal of International Business Studies*, Vol. 26, num. 3, pp. 461–93.
- Dunning, J. H.; Lundan, S. M. (2010): "The institutional origins of dynamic capabilities in multinational enterprise", *Industrial and Corporate Change*, Vol. 19, num. 4, pp. 1225–1246.
- Foss, N. J.; Klein, P. G.; Kor, Y. Y.; Mahoney, J. T. (2008): "Entrepreneurship, subjectivism, and the resource-based view: toward a new synthesis", *Strategic Entrepreneurship Journal*, Vol. 2, num. 1, pp. 73–94.
- Gans, J.; Stern, S. (2010): "Is there a market for ideas?" *Industrial and Corporate Change*, Vol. 19, num. 3, pp. 805–837.
- Harrell, J. B.; O'Reilly, C. A.; Tushman, M. L. (2007): "Dynamic capabilities at IBM: driving strategy into action", *California Management Review*, Vol. 49, num. 4, pp. 21–43.

- Kirzner, I. M. (1985): *Discovery and the capitalist process*, University of Chicago Press: Chicago.
- Lippman, S. A.; Rumelt, R. P. (1982): "Uncertain imitability: An analysis of inter-firm differences in efficiency under competition", *Bell Journal of Economics*, Vol. 13, num. 2, pp. 418–438.
- Luo, Y. (2000): "Dynamic capabilities in international expansion", *Journal of World Business*, Vol. 35, num. 4, pp. 355–378.
- Lutz, B. (2011): "Life lessons from the car guy". *WSJ.com* (Wall Street Journal). June 11. <http://online.wsj.com/article/SB10001424052702304259304576375790237203556.html>.
- Nonaka, I. (1988): "Toward middle-up-down management: Accelerating information creation", *Sloan Management Review*, Vol. 29, num. 3, pp. 9–18.
- Nonaka, I. (1991): "The knowledge-creating company", *Harvard Business Review*, Vol. 69, num. 6, pp. 96–104.
- Nonaka, I. (1994): "A dynamic theory of organizational knowledge creation", *Organization Science*, Vol. 5, num. 1, pp. 14–37.
- Nonaka, I.; Toyama, R. (2007): "Strategic management as distributed practical wisdom (phronesis)", *Industrial and Corporate Change*, Vol. 16, num. 3, pp. 372–394.
- Penrose, E. T. (1959): *The theory of the growth of the firm*. John Wiley: New York.
- Schectman, J. (2012): "Skanska Opens Mobile App Development To Field Workers". *WSJ.com* CIO Report blog, November 20. URL: <http://blogs.wsj.com/cio/2012/11/20/skanska-opens-mobile-app-development-to-field-workers/>.
- Teece, D. J. (1976): *The multinational corporation and the resource cost of international technology transfer*. Ballinger Publishing: Cambridge, MA.
- Teece, D. J. (1981): "The market for know-how and the efficient international transfer of technology", *Annals of the Academy of Political and Social Science*, 458 (November), pp. 81–96. In R. G. Hawkins & A. J. Prasad (Eds.), *Technology Transfer and Economic Development*, JAI Press: Greenwich, CT.
- Teece, D. J. (1982): "Towards an economic theory of the multiproduct firm", *Journal of Economic Behavior and Organization*, Vol. 3, num. 1, pp. 39–63.
- Teece, D. J. (1986): "Profiting from technological innovation", *Research Policy*, Vol. 15, num. 6, pp. 285–305.
- Teece, D. J. (2007): "Explicating dynamic capabilities: The nature and microfoundations of (sustainable) enterprise performance", *Strategic Management Journal*, Vol. 28, num. 13, pp. 1319–1350.
- Williamson, O. (1975): *Markets and hierarchies: Analysis and antitrust implications*. Free Press, New York.

NOTES

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The Collaborative, Ambidextrous Enterprise

La Empresa colaborativa y ambidiestra

I. INTRODUCTION

What kinds of organizations can support high levels of performance in the contemporary world of work? As many observers have pointed out, work is increasingly knowledge-intensive, because knowledge is replacing land, labor, and capital as sources of wealth (Nonaka, Toyama, and Nagata 2000; Grant 1996). Moreover, work is increasingly solutions-oriented, because the interactive co-production of services is replacing the mass production of standardized goods (Applegate, Austin, and Collins 2006; Galbraith 2002). And finally, competition has grown more dynamic, less predictable, and more global. As a result, many organizations have found that whereas in the past they could focus on just one dimension of performance — either innovation, flexibility, and the exploration of new opportunities, or efficiency, control, and the exploitation of existing capabilities — today they must find ways to improve on both dimensions simultaneously. In other words, they must become “ambidextrous”. Achieving ambidexterity is difficult; some doubt it is even possible. Management theory teaches us that organizational performance is a function of the fit between the organization’s goal and its internal design — its structures of authority, staffing and compensation policies, decision-making systems, etc. An organization whose strategy requires excellence in innovation should adopt an “organic”

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EXECUTIVE SUMMARY

This article aims to advance our understanding of the organizational prerequisites of ambidexterity. Ambidexterity is the ability simultaneously to exploit existing capabilities and to explore new opportunities. Prior research suggests that ambidexterity requires a strong bond of trust among the relevant actors. However, trust can also stifle innovation. We resolve this contradiction by developing a typology of trust, differentiating the traditionalistic (clan) type from the charismatic, contractual, and collaborative types, and we show how this last, collaborative type supports ambidexterity by its distinctive values (based on contribution to a shared purpose), norms (based on interdependent process management), and congruent authority and economic systems. We illustrate our argument with a case study of Kaiser Permanente, a large health system in the USA.

RESUMEN DEL ARTÍCULO

Este artículo persigue avanzar nuestra comprensión sobre los prerequisites organizativos de la ambidestreza. La ambidestreza es la habilidad de explotar las capacidades existentes y explorar nuevas oportunidades de manera simultánea. Investigaciones previas sugieren que la ambidestreza requiere de una fuerte dosis de confianza entre los actores relevantes. Sin embargo, la confianza también puede axfixiar la innovación. Nosotros resolvemos esta contradicción desarrollando una tipología de confianza que soporta la ambidestreza por medio de sus valores distintivos (basados en la contribución a un propósito compartido), normas (basadas en la gestión de procesos interdependientes), y una autoridad y sistemas económicos congruentes. Ilustramos nuestros argumentos con un caso de estudio de Kaiser Permanente, una gran empresa del sistema de salud de EE.UU.

Ambidexterity depends on building a specific type of trust, one that is open and flexible. We call this this type of trust “collaborative” (Heckscher & Adler, 2006). Collaborative trust is based on institutionalized dialogue and shared purpose

organizational form, whereas an organization aiming for excellence in efficiency should adopt a more “mechanistic” form (Burns & Stalker, 1961). Many management theorists have therefore argued that if an organization attempts to compete on two dimensions at once, it can achieve at best only mediocre levels of performance on either dimension.

Many organizations under performance pressure have sought ways of organizing that mitigate this trade-off. Early efforts in this direction took the form of partitioning the organization into functionally differentiated subunits: R&D units focused on innovation and adopted an organic form, and operations units focused on efficiency

and adopted a mechanistic form. More recently, some firms have sought to develop ambidexterity by partitioning business units into business-line subunits, each with its full complement of dedicated functions — one subunit pursues innovation goals and is more organic, and the other pursues efficiency goals and is more mechanistic. And some organizations aim to develop ambidexterity more widely within the organization: they create functional subunits within which organic and mechanistic features are combined, and where, as a result, R&D units become more efficient in their innovation work, while operations units become more innovative in their efficiency-oriented work.

However, any of these forms of ambidexterity can only succeed if the efforts of the differentiated subunits or roles are effectively integrated. If the people in differentiated subunits and roles focus only on their own parochial goals, if they hold each other at arm’s length and respond defensively to their partners’ needs, if they do not trust each other, then

the organization’s performance will indeed be mediocre in both performance dimensions.

Trust is therefore a critical ingredient to successful ambidexterity. But not all trust is helpful in this context: some high-trust organizations are inwardly focused and resistant to change — creating a context hardly conducive to ambidextrous innovation. Ambidexterity depends on building **a specific type of trust**, one that is open and flexible. We call this this type of trust “collaborative” (Heckscher & Adler, 2006). Collaborative trust is based on institutionalized dialogue and shared purpose. It differs from the three, more familiar forms of trust: the *traditionalistic clan* type based on status, loyalty, and

deference; the *charismatic* type based on an shared emotional bond to a transcendent idea and an exemplary leader; and the *contractual* type, both of whose variants (bureaucracy and market) are based on individual autonomy, financial incentives, and administrative authority. (This typology of trust and the corresponding organizational models builds on sociological theories of Weber (1978) and his typology of social action.)

It is important to discriminate among these types of trust because each supports a different type of strategic goal, as shown in **Exhibit 1**. Here we differentiate strategic goals depending on the importance they give to exploitation (extending existing capabilities via incremental innovation for greater efficiency and control) and/or exploration (radical innovation for the creation of new capabilities and greater flexibility).

KEY WORDS

Collaborative model, ambidexterity, trust, case study

PALABRAS CLAVE

Modelo colaborativo, ambidestreza, confianza, caso ilustrativo

Exhibit 1. Different types of trust support different strategic goals

Exploitation

Goals: Trust:	Efficiency, control Contractual-bureaucratic	Ambidexterity Collaborative
Goals: Trust:	Stability Traditionalistic	Innovation, flexibility Contractual-market or Charismatic

Exploration

Traditionalistic trust helps businesses whose goal is stability but handicaps those pursuing either efficiency or innovation. *Charismatic* trust facilitates intermittent radical innovation but impedes efficiency. *Contractual* trust encourages a commitment to performance relative to contractually specified rules and/or output goals: such trust can provide either efficiency/control (via a focus on rules in the bureaucratic variant) or innovation/flexibility (via a focus on outputs characteristic of the market variant), but not both at once. To achieve simultaneous improvements in both innovation and efficiency, organizations need a *collaborative* type of trust in which commitment is to contributing to fulfilling the organization's purposes and to developing the best working procedures to that end.

2. A NEW MODEL OF ORGANIZATION — COLLABORATION

How then can an organization create and sustain the collaborative type of trust? The extent and type of trust in an organization are a function of organization's characteristics in four dimensions. The two most obviously relevant are the organization's shared *values* and its *norms*; but no less important are the organization's *authority* and *economic* structures. (Here, we are adapting Parsons' (1971) classic AGIL framework). Using this four-dimensional framework, we can contrast the collaborative model of organization with other, better-known models by synthesizing the results of a considerable body of management research and the lessons of many organizations' organization design efforts.

Values. In the values dimension, the key feature of the collaborative model is a commitment to values that privilege contribution to the organization's shared purpose. As suggested above, this marks a strong contrast with the traditionalistic clan model, which places primary value on loyalty to the group; it contrasts with the charismatic model, which values the emotional bond to leaders and to the transcendent values they represent; it contrasts with markets, which value autonomy and pecuniary gain; and it contrasts with bureaucracy, which values conformance and control. These last two contrasts are particularly important: the collaborative model accords its highest praise not to people who "meet their numbers" but to those who are able to look beyond their specific roles and who do whatever is needed to advance the common purpose. We call this orientation the *ethic of contribution*. Moreover, to sustain collaborative trust, this shared purpose must be rationally established — open to public debate and subject to regular review through participative and dialogical strategy processes. This differentiates collaborative values from those characteristic of the contractual model, where the organization's purposes are dictated from above or by the market; from the traditionalistic model, where purposes are taken for granted; and from the charismatic model, where the commitment to purposes is emotionally rather than rationally grounded.

Norms. For any model to function effectively as a social system, its shared values (whatever they may be) must be buttressed by corresponding norms — that is, by behavioral expectations that guide working relations among people playing differentiated roles. Collaborative norms are distinctive in creating what we call *interdependent process management*, exemplified in processes



such kaizen, process mapping, brainstorming, participatory meeting management, and multi-stakeholder decision-making. These norms enable people in differentiated roles and subunits to manage their interdependencies through direct dialogue; such dialogue is supported by formal procedures; and all these people, whatever their hierarchical level or affiliation, have a genuine voice in designing and refining these procedures.

Interdependent process management buttresses with more formalized norms the “informal organization”, which has long functioned as a kind of hidden complement to formal bureaucratic mechanisms. Like bureaucracy, interdependent process management has standards, procedures, specialized roles, and authority ranks; but in the collaborative model these are used in the service of the shared purpose rather than as means of top-down control. In contrast to any of the other models, the collaborative model is in this way able to mobilize sizeable cross-functional and cross-unit teams towards the organization’s goals, and people can move more fluidly between such teams. (Ainamo 2007; Heckscher 2007).

Authority. Ambidexterity requires that contributors attend simultaneously to exploration and exploitation goals. When organizations attempt to orchestrate such efforts by relying on the familiar bureaucratic hierarchy of authority, the result is typically an overemphasis on just one of these goals. Sustained ambidexterity in any larger-scale organization therefore requires a distinctive authority structure — the matrix, with multiple accountabilities (Galbraith, 1994). Matrixed authority is difficult to sustain, and many organizations that have tried it have given up in frustration. However, the key reason for failure is not that the matrix violates some law of nature — its failures have been due to a deficit of collaborative trust. Competitive demands for ambidexterity increase the payoff to firms who have mastered this challenge. Indeed, among successful organizations, there has been an evolution over recent decades towards expanding the number of dimensions in the matrix (Heckscher, 2007; Galbraith, 2008; Strikwerda and Stoelhorst, 2009).

To sustain the trust required for effective matrix structures and ambidexterity, the collaborative model relies on an authority structure that is both participative and centralized. Exploratory innovation often results from a highly decentralized structure in which people have room to experiment without prior approval from above; but if the organization as a whole is going to benefit from these exploration

efforts, some centralization is needed to ensure their strategic guidance and systematic exploitation. This tension can only be managed if centralization takes a highly participative form. Participative centralization may appear paradoxical if we assume that centralization and participation are polar opposites; but they are not. A collaborative enterprise coordinates activity across the whole organization – in that sense, it is *centralized*; but it achieves this result *participatively*, by involving those whose work is affected by the decisions.

The resulting emphasis on *interdependence* contrasts with the market and bureaucratic models' emphasis on *dependence* and *independence*. In a bureaucracy, each job has its own autonomous sphere of action, and higher levels establish the boundaries of autonomy for lower levels. When excessive centralization causes communications slowdowns and rigidity, many organizations respond by turning to the market model and creating independent business units. But this rarely solves the problem: it exacerbates the difficulty of achieving coordination and trust across the units. Many large corporations therefore go through cycles of centralization and decentralization in search of an elusive balance. A collaborative enterprise, by contrast, treats its components as interdependent: all its members must consider how their actions affect others who are engaged with them in pursuing the shared purpose.

Participative centralization thus contrasts with the decentralized structure of authority of the contractual-market model, which supports exploration but not exploitation. It also contrasts with the low-participation, high-centralization structure of the contractual-bureaucratic model, which support exploitation but not exploration. It contrasts with the low participation and low centralization of the traditionalistic model, which is characterized by “fiefdoms” of semi-independent, autocratic power. And it contrasts with the charismatic model, which is characterized by a low degree of functional specialization and a simple hierarchy centered on a leader from whom innovation flows. Each of these falls short in structuring the combination of creative exploration and disciplined exploitation that constitutes ambidexterity.

Economics. The economic dimension in organizations has two aspects: capabilities and incentives. As concerns capabilities, the collaborative model requires a “T-shaped” set of technical skills — deep knowledge in one’s own specialty combined with some knowledge of related technical specialties — and the corresponding process and social skills to enable effective teamwork. Such

T-shaped skill sets afford the common ground critical in cross-unit collaboration and learning. The capabilities required in the other models are more narrowly specialized.

As concerns incentives, the collaborative model requires incentives that reflect the basic value-orientation of contribution to the organization's purpose. Here, rewards are based on a mix of personal performance, team performance, and the entire organization's progress towards its purpose. Insofar as the collaborative model differentiates rewards by individuals, the key criterion is the individual's contribution to that purpose. Because formal supervisors cannot be aware of the entire range of activities of their subordinates when these latter are engaged on multiple projects and contributing on cross-cutting dimensions, collaborative organizations rely on multisource ("360 degree") assessments. In both the criteria and process, the other organizational models have very different reward systems: the traditionalistic model relies on status; the charismatic model, on the leader's approval; the bureaucratic model, on procedural conformance; and the market model, on market outcomes.

Inter-organizational relations. So far, our discussion has focused *within* the organization; but ambidexterity often also requires a collaborative approach to relations *between* organizations, whether these relations take the form of supply chains, associations, alliances, or regional clusters. Such relations often rely on traditionalistic ties based on loyalty, on charismatic ties based on personal appeal, on contractual-market ties based on instrumental self-interest, or on contractual-bureaucratic ties based on complex contracts: but they can also be based on collaborative ties grounded in shared commitment to common purposes. Even though collaborative ties are often undermined by inter-firm competition, it is this collaborative type that offers the greatest potential for inter-firm networks aiming for ambidextrous excellence in both exploration and exploitation (Hagel et al. 2010; Miles et al. 2009).



3. THE COLLABORATIVE MODEL COMBINES MECHANISTIC AND ORGANIC FORMS

To return to the point made in the introduction, ambidexterity requires that firms somehow combine organic and mechanistic forms of organization. Building on the preceding section, **Exhibit 2** describes how firms can achieve this synthesis in a way that avoids compromising performance on either exploration or exploitation dimensions of performance.

Exhibit 2. **Synthesizing Mechanistic and Organic forms**

MECHANISTIC	COLLABORATIVE	ORGANIC
Rigid departmentalization	Employees have their own specialized tasks, but they focus on contributing to the common task and often go beyond their formal job descriptions	Cross-functional teams
Narrow spans of control	There is a clear structure of authority and accountability, but is often multidimensional (matrixed)	Little direct supervision
High formalization	Processes are formalized, but (a) they are also adjusted through teamwork and dialogue, and (b) they are constantly refined with the involvement of those doing them	Minimal formal rules
Clear chain of command	Communication is organized according to purposes and projects, and who can best contribute to them; thus it often cuts across the formal chain of command, but is highly organized	Open communication network
Centralization	Centralized but participative: there is much local initiative and responsiveness but also strong overall coordination across the system. Decentralized initiative must be justified in relation to overall purposes	Decentralization
Low decision participation	Participation based on capacity to contribute to task or mission	Empowered employees

This collaborative synthesis has not been well delineated in previous management scholarship — indeed, much of that scholarship denies the very possibility of such a synthesis. Mintzberg’s (1979) typology offers little hope for ambidexterity, since his “adhocracy” model is presented as an organic form “with little formalization” (p. 432). This kind of organization supports exploration much better than it supports efficiency and exploitation. Another popular typology, the Competing Values framework, also includes an adhocracy type, defined by an emphasis on flexibility (rather than control) and a strong external (rather than internal) focus (Cameron, 1986; Cameron & Quinn, 1999; Zammuto & Krakower, 1991). (In other studies, the same quadrant is called “open systems” (Quinn & Rohrbaugh, 1981), “developmental” (Quinn & Rohrbaugh, 1983), or “adaptable” (Denison, Cho, & Young, 2005), Worley and Lawler (2006). The Competing Values typology tells us little about how to design ambidextrous organizations that must be strong simultaneously on flexibility and control dimensions. Our collaborative model is closer to the “contextual ambidexterity” model proposed by Gibson and Birkinshaw (2004). They discuss four climate and culture features taken from Ghoshal and Bartlett

(1997): stretch, discipline, support, trust. In their empirical research, they found that these four features resolved into two factors: (a) “performance management context” creating discipline and stretch, and (b) “social context” creating support and trust. Examining the component items, this framing seems to support the arguments of Blake and Mouton (1978) – good managers show concern for both production (discipline and stretch) and for people (support and trust). Our main thesis is that it is important to distinguish among the various *types* of “support and trust” because the different types assist with different strategic priorities.

There is some evidence that a collaborative form is not only a better mix, but also outperforms one-dimensional organizations at their own games. That is, an effective collaborative system is better at efficiency than a bureaucracy, because it engages members in continuous improvement and problem-solving; and it is better at innovation than a market or decentralized bureaucracy, because it coordinates knowledge more effectively across a wider scope. We will see this in the following case.

4. A CASE ILLUSTRATION: KAISER PERMANENTE

We can illustrate the features of the collaborative model with an example from the US healthcare industry – Kaiser Permanente. The US healthcare industry is a context in which ambidexterity has become a pressing priority. Healthcare delivery organizations need to be aggressive in exploiting evidence-based practices that will drive improvement in cost and safety and in assuring patients faster access and shorter hospital stays. Simultaneously, these organizations are under pressure to make radical innovations in their infrastructure (for example, with electronic health records), to stay abreast of rapid and radical innovation in diagnostic and treatment technologies, and to be flexibly responsive to the great variety of patient needs as well as the urgency of many of these needs.

One asset the healthcare industry can leverage in attempting to meet these ambidexterity demands are the shared values that have long guided medical practice: values focused on serving the patient's health needs create a foundation of shared purpose characteristic of the collaborative model. In reality, however, the practice of medicine in the US has often combined this dedication with strong elements of the traditionalistic, contractual, and charismatic models (Adler et al., 2008). Traditionalistic elements have long been visible

in the professional loyalty that binds doctors together in defense of peers against criticism or interference by outsiders, and in the impact of status differences on many doctors' interactions with nurses. Contractual-bureaucratic elements have been increasingly visible where government agencies or insurance companies dictate to doctors which tests and procedures they can use. Contractual-market values increasingly encourage doctors to multiply tests and procedures to maximize their own income, even referring patients to imaging and surgery centers in which they have an ownership stake. Charismatic elements are visible where "star" doctors wield charismatic authority over peers, other clinical and non-clinical staff, and patients.

Kaiser Permanente ("Kaiser" for short) is one healthcare organization in the US that has long sought to encourage doctors to practice medicine in a more collaborative way. Kaiser is the largest healthcare provider and one of the largest healthcare insurance companies in the country, with nearly 9 million health plan members, 167,300 employees, 14,600 physicians, 35 medical centers, and 431 medical offices. It is organized as a consortium of the (not-for-profit) Kaiser Foundation Health Plan (insurance), the (not-for-profit) Kaiser Foundation Hospitals, and a set of affiliated regional Permanente Medical Groups (which are for-profit physician partnerships or professional corporations that do business almost exclusively with Kaiser).

Unlike independent practitioners still common in the US healthcare system, Kaiser physicians are salaried members of a group practice. Doctors new to Kaiser go through a three-year probationary period during which they are regularly evaluated not only on their technical competence but also on their collegial relations with other doctors, the respect they show for other staff and patients, their willingness to contribute ideas and effort to improving the organization's performance. Being salaried, Kaiser doctors are somewhat insulated from the market pressures experienced by physicians in private practice. On the other hand – and somewhat controversially – Kaiser doctors are expected to consider the economic consequences of their treatment decisions. Where many doctors in private practice have long refused any role in controlling healthcare expenditures, Kaiser doctors participate in that effort.

Kaiser physicians are managed under relatively formalized procedures and authority structures; but Kaiser has sought to ensure

that these systems support collaboration rather than a contractual-bureaucratic model. Clinical guidelines illustrate the point. Where many doctors in private practice chafe under the bureaucratic constraints of medical guidelines imposed by government or insurance companies, Kaiser doctors collaborate with their Kaiser peers and with other clinical and non-clinical personnel to define guidelines. When the activity is entirely within purview of a medical specialty, the relevant group of doctors will develop these guidelines themselves. When the activity involves multiple specialties and other staff, these guidelines are developed with broader input and participation.

The collaborative model at Kaiser also encompasses unions and unionized workers. Unions are an essential part of Kaiser's business, and Kaiser has developed a labor/management partnership that is unique in its scale and ambition (Kochan et al., 2008; Kochan, Eaton, McKersie, & Adler, 2009). Most of Kaiser's non-physician, non-managerial employees are unionized, and many of Kaiser's "customers" — the members covered by Kaiser's insurance plan and treated by Kaiser doctors — are unionized too. As a result, and unlike many other employers in the US, it is difficult for Kaiser to take an anti-union position without risking both a great deal of internal organizational turmoil and damage to their reputation in the target market. However, the unions also see that using their power in confrontational ways risks destroying Kaiser— even though, compared to other employers, Kaiser pays and treats its workers relative well. The parties recognized their interdependence in a landmark partnership agreement, included in the collective bargaining contract in 1997. The collaboration enabled by this partnership has become central to Kaiser's efforts to meet its ever-intensifying ambidexterity challenges, providing a foundation for combining top-down initiatives by specialized technical staff (e.g. for new computerized medical records), and "bottom-up" input and involvement by a broad range of personnel (for local improvement projects), as well as extensive lateral learning (so that similar locations can share lessons learned).

The labor/management partnership functions not only as a labor relations strategy but also as an operating strategy that shapes everyday decision-making and behavior across the organization. As a *labor relations strategy*, the partnership helps Kaiser meet its ambidexterity challenges through its reliance on "interest-



based bargaining” (McKersie et al., 2008). Management and labor negotiate to find areas where they can find common ground and win-win solutions that create a bigger pie (“integrative” bargaining), while on other issues where there are no win-win solutions they bargain over the relative shares of the pie (“distributive” bargaining). Taking the integrative part seriously means that the union gets deeply involved in helping shape the organization’s goals as well as how it operates. Taking the distributive part seriously means that even as they engage with management on these issues, unions work to preserve and strengthen their capacity for independent action.

As an *operations strategy*, the partnership helps Kaiser meet its ambidexterity challenges by supporting participative centralization across the organization. An entire hierarchy of joint labor/management committees governs decision-making from the national, to the regional, down to the facility level. This hierarchy has progressively expanded downward to the work unit level. Starting in 2005, unions and management in each facility began to set up labor/management teams in every unit in every facility. Participation was voluntary, but by 2012, almost every department in the entire organization had at least one such team in place. These unit-based teams work on improvements that they see as most relevant to their work, choosing targets that contribute in some way to one of the over-arching strategic priorities defined by Kaiser’s “Value Compass”.

The Value Compass nicely captures several of the key features of the collaborative model. First, it defines the shared purposes of the organization in use-value terms, that is, in terms that identify the specific contributions of Kaiser to society — “Best quality, best service, most affordable, best place to work” — rather than only in financial terms. Second, these goals were not dictated by top management; instead, they were jointly defined by management and unions. Third, the Value Compass is not a “vision” statement designed to galvanize emotional enthusiasm as we might find in the charismatic model; instead, it is a statement that defines in a rational way, thus open to discussion, the purposes of the organization. Finally, people at all levels are engaged in working out how they can translate the top-level Value Compass purposes into their local work processes, giving them a unity of purpose in their daily work and their daily improvement efforts.

In the unit-based teams, unionized staff, management, and

physicians cooperate in examining every step of the work process to analyze why and when and how people perform their tasks and to ask if there might be a more efficient and effective way to operate. (The collective bargaining agreement protects union members from being laid off as a result of any of these improvement efforts: where changes in services or technology have made jobs redundant, the agreement provides relatively generous provisions for retraining and a commitment to doing whatever is feasible to find employment elsewhere within Kaiser). Working in these teams, physicians have been challenged to give up their hierarchical, status-based, or charismatic authority and to work collaboratively with nurses, technicians, cleaners, and administrators. These latter categories of workers have developed new skills in problem-solving, leading meetings, analyzing work processes, identifying improvement opportunities, presenting cogent arguments in team meetings and bigger forums, energizing others to get involved, dealing with conflicting views and divergent interests, and understanding the business side of Kaiser and the economics of healthcare.

This collaborative, ambidextrous organization has indeed seen dramatic improvements both in exploration and exploitation dimensions. Kaiser performs near the top of healthcare delivery organization in many of the key operational metrics (Schilling et al., 2010) (Whippy et al., 2011), and has developed an impressive capacity for radical innovation (Nelson, 2010). Surveys of worker attitudes conducted jointly by union and management show improved worker morale too, with widespread support for the partnership process and its outcomes (which have, in recent years, included wage and benefit gains as well as growth in union membership).

5. WHAT DOES COLLABORATION MEAN IN A BUSINESS SETTING?

Readers might reasonably ask themselves if this portrait of the collaborative model is utopian. Any capitalist business can only go so far in building and sustaining any type of cooperation, let alone this strong form we call collaboration. Pressures from the market, the competition, or the stock market can and often do destroy the possibility of cooperation. As a business, the organization's goal is basically profit, not people. So when a market shrinks, or new competitors appear, workers are often laid off, teams are torn apart,

and people stop caring or trusting. Even when sales are growing, profit pressures often push businesses to cut costs, to cut corners on quality, and to ignore social and environmental externalities, and when workers see the firm doing any of these, they often withdraw their commitment and trust. There are therefore good reasons to be pessimistic about the prospects for sustained collaboration in business.

On the other hand, however, for a business organization to generate profits, it must deliver a service or product that people are willing to pay for. If the product is too shoddy or too expensive, if the service not flexible enough, if the business cannot innovate rapidly enough to keep up with the competition and with customer needs, then the business will fail. And without some degree of cooperation with workers, that outcome is almost inevitable.

Businesses therefore have a real interest in maintaining cooperation — even if, at the same time they are constantly tempted to do things that will undermine that cooperation. This assertion may sound as if we are contradicting ourselves, but a moment's reflection shows that it is rather common-sensical: the contradiction is in the reality of capitalist business. This contradiction is not, however, static: the balance in that tension shifts in favor of collaboration to the extent that the business conditions require ambidexterity. Here the organization needs much more from its employees than just a minimal degree of cooperation: its performance and very survival demands “all hands on deck” — the organization needs everyone's improvement ideas, everyone's willingness to find ways of doing things better and cheaper. Such organizations need collaboration rather than just reluctant compliance, and it becomes much more expensive for the organization to sacrifice cooperation for profit.

6. PUTTING THIS IN HISTORICAL PERSPECTIVE

Going back to the 19th century, US industry was dominated by the traditionalistic model. But these traditionalistic organizations experienced great difficulty responding to changing market demands and technologies and even greater difficulty initiating such changes, because they had no systematic way of changing the methods dictated by custom. This rigidity was an important factor encouraging the rise of the contractual form, which enabled deliberately planned or negotiated change through a mix of market and bureaucracy. However, contractual relations proved too “thin”



to support most day-to-day working relations, which cannot be reduced to predefined and measurable agreements. So many large businesses ended up with a hybrid of paternalist loyalty, bureaucratic formalism, and market flexibility. It is that mix which has been challenged in the past few decades by the increased pressure for innovation, improvement, and ambidexterity: this has led to intensified interest in the collaborative form.

Traditionalistic, contractual, and collaborative types of trust and organizational models trace a developmental sequence marked by increasing scope of innovation and choice. The traditionalistic model requires close adherence to concrete ways of doing things defined by the past. The contractual model allows a wider range of action, but it requires predefined agreements or rules with quantifiable and objectively observable outcomes. The collaborative model broadens the scope of innovation still further by enabling more continuous improvement and more flexible problem solving within the limits of agreed-on processes and missions. The charismatic model is also very effective in mobilizing support for radical innovation and change, but it is by nature ephemeral: charismatic organizations endure only by mutating into one of the other three models. (The sociologist Max Weber famously called this process the “routinization of charisma”). Conversely, as organizations progress from traditionalistic to contractual to collaborative, the less they need to rely on charismatic enthusiasm for their innovative drive.

The collaborative model has been around for a long time in embryonic form, in institutions peripheral to or outside the economic sphere — institutions such as science, universities, cooperatives, and voluntary cultural activities. What is new is that we are now seeing this model begin to take root in business enterprises at the heart of the modern economy. But in order for this model to flower, the grip of traditionalistic and contractual institutions will need to weaken and robust institutional form will need to found for the key features of the collaborative model.

This evolution is difficult in enterprises that are under competitive economic pressure and that rely on wage labor. As noted in the previous section, performance pressures stimulate the emergence of this new, higher form of organization, even though these same pressures often undermine collaboration. Collaborative organization is therefore a precarious accomplishment, and progress in its diffusion is not a smooth or linear process.

REFERENCES

- Ainamo, A. (2007): "Coordination mechanisms in cross-functional teams: a product design perspective", *Journal of Marketing Management*, Vol. 23, num. 9, pp. 841–860.
- Applegate, L.; Austin, R.; Collins, E. (2006): IBM's decade of transformation. Case study. Harvard Business School.
- Blake, R.; Mouton, J. (1978): The new managerial grid. Gulf: Houston.
- Burns, T.; Stalker, G.M. (1961): The Management of Innovation. Tavistock: London.
- Cameron, K. (1986): "Effectiveness as paradox: Consensus and conflict in conceptions of organizational effectiveness", *Management Science*, Vol. 32, num. 5, pp. 539–553.
- Cameron, K.S.; Quinn, R.E. (1999): Diagnosing and changing organizational culture. Addison-Wesley: Reading, Mass.
- Denison, D.; Cho, H.; Young, J. (2005): "Diagnosing organizational cultures: Validating a model and method", *International Institute for Management Development, Working paper*, 11.
- Galbraith, J.R. (2002): "Organizing to Deliver Solutions", *Organizational Dynamics*, Vol. 31, num. 2, pp.194–207.
- Ghoshal, S.; Bartlett, C. (1997): The Individualized Corporation: A Fundamentally New Approach to Management. Harper Business: New York.
- Gibson, C.; Birkinshaw, J. (2004): "The antecedents, consequences, and mediating role of organizational ambidexterity", *Academy of Management Journal*, Vol. 47, num. 2, pp. 209–226.
- Grant, R.M. (1996): "Toward a knowledge-based theory of the firm", *Strategic Management Journal*, Vol.17, num. 10, pp. 109–22.
- Hagel, J., Brown, J.; Jelinek, M.; Sitkin, S.; Cardinal, L.; Bijlsma-Frankema, K. (2010): "Relational Networks, Strategic Advantage: New Challenges For Collaborative Control". In Control in organizations: New directions in theory and research. Cambridge University Press: Cambridge, UK.
- Heckscher, C. (2007): The Collaborative Enterprise. Yale University Press: New Haven, CT.
- Heckscher, C.; Adler, P. (2006): The Firm as a Collaborative Community: Reconstructing Trust in the Knowledge Economy. Oxford University Press: New York
- Lawler, E.; Worley, C. (2006): Built to change. Josey Bass: San Francisco.
- McKersie, R.B.; Sharpe, T.; Kochan, T.A.; Eaton, A.E.; Strauss, G.; Morgenstern, M. (2008): "Bargaining Theory Meets Interest-Based Negotiations: A Case Study", *Industrial Relations*, Vol. 47, num. 1, pp. 66–96.
- Miles, R.E.; Miles, G.; Snow, C.C.; Blomqvist, K.; Rocha, H. (2009): "The I-Form Organization", *California Management Review*, Vol. 51, num. 4, pp. 61–76.
- Mintzberg, H. (1979): The structuring of organizations: A synthesis of the research. Prentice-Hall: Englewood Cliffs, N. J.
- Nelson, F. (2010): "Full Nelson: Healthcare innovation: Kaiser's Garfield Center". *InformationWeek*, Feb 23.
- Nonaka, I.; Toyama, R.; Nagata, A. (2000): "A firm as a knowledge-creating entity: a new perspective on the theory of the firm", *Industrial and Corporate Change*, Vol. 9, num. 1, pp. 1–20.
- Parsons, Tt. (1971): The system of modern societies. Prentice- Hall: Englewood Cliffs, N.J.
- Quinn, R.; Rohrbaugh, J. (1981): "A competing values approach to organizational effectiveness", *Public Productivity Review*, Vol. 5, num. 2, pp. 122–140.
- Quinn, R.E.; Rohrbaugh, J. (1983): "A spatial model of effectiveness values approach to organizational analysis", *Management Science*, Vol. 29, num.3, pp. 363–377.
- Schilling, L.; Chase, A.; Kehrl, S.; Liu, A.Y.; Stiefel, M.; Brentari, R. (2010): "Kaiser Permanente's performance improvement system, Part 1: From benchmarking to executing on strategic priorities", *Joint Commission Journal on Quality and Patient Safety*, Vol. 36, num. 11, pp. 484–498.
- Weber, M. (1978): Economy and society. University of California Press: Berkeley C.A.

Whippy, A.; Skeath, M.; Crawford, B.; Adams, C.; Marelich, G.; Alamshahi, M.; Borbon, J. (2011): "Kaiser Permanente's Performance Improvement System, Part 3: Multisite Improvements in Care for Patients with Sepsis", *Joint Commission Journal on Quality and Patient Safety*, Vol. 37, num. 11, pp. 483–483 AP.

Zammuto, R.F.; Krakower, J.Y. (1991): "Quantitative and qualitative studies of organizational culture", *Research in Organizational Change and Development*, Vol. 5, pp. 83–114.

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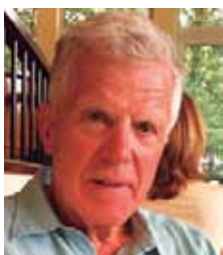
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Steps towards a Theory of the Managed Firm (TMF)

Hacia una teoría de la “Empresa Dirigida”
(Managed Firm)

52



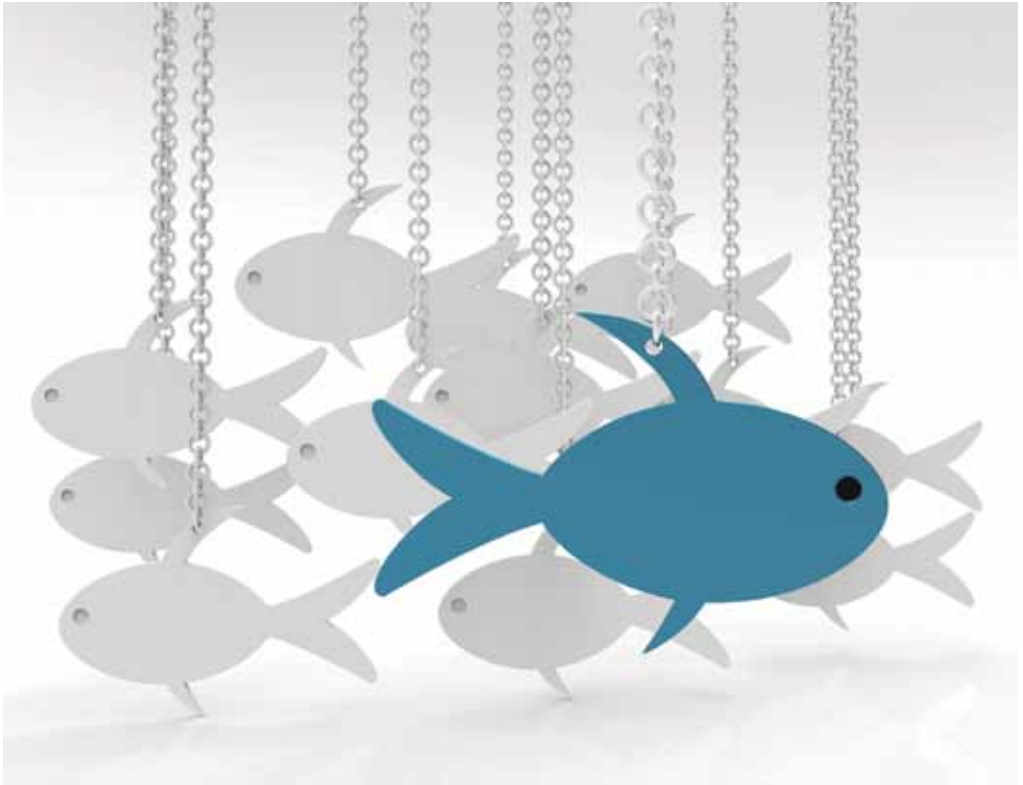
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I. THE POST-COASIAN PROGRAM

Notions of managing are entwined with experiencing the situation being managed. Managing a country is not the same as managing a firm; managing a family firm differs from managing a global giant. English language organization and management (O&M) scholars are presently focused on private firms rather than on countries or public sector agencies. But what is a private firm? Mainstream economists tell us their ‘theory of the firm’ is actually about firms’ market engagements and pricing decisions (Demsetz, 1991; Hawkins, 1973) and that they have no answers to Coase’s 1937 killer questions - why firms exist, why their boundaries are as they are, why their internal arrangements are as they are, and why their performance is so varied (Coase, 1937). Demsetz remarked that regrettably, for 30 years after the appearance of Coase’s paper, the ‘theory of the firm’ research maintained a ‘theoretical slant ... that prevented an examination of facts pertaining to firms’ (Demsetz, 1995:1). Eventually Coase’s work encouraged a small group of economists into new efforts to create a new and more managerially relevant theory of the firm (ToF). A huge micro economic literature with many distinct threads has resulted - transaction cost theory, property rights theory, principal-agent theory, nexus of contracts, and so on. Williamson’s Nobel is this project’s shining achievement. Foss & Klein summarize the situation’s possibilities well (Foss & Klein, 2012).

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EXECUTIVE SUMMARY

In 1937 Ronald Coase posed several killer questions about the nature of the firm; why (a) do they exist, (b) are their boundaries where they are, (c) are their internal arrangements as they are, and (d) is their performance so varied. These questions precipitated new 'theories of the firm' - principal-agent theory, transaction cost analysis, and so on. In this paper I turn these questions around and into a critique of 'rational man' theorizing. I argue the fundamental nature of the firm is as a 'managed' context for the exercise of imagination and judgment.

RESUMEN DEL ARTÍCULO

En 1937, Ronald Coase plantea varias preguntas asesinas sobre la naturaleza de la empresa, ¿por qué (a) existen, (b) están sus fronteras donde ellas están, (c) son sus mecanismos internos como son, y (d) su rendimiento es tan variado. Estas preguntas dio lugar al surgimiento de nuevas "teorías de la empresa" - teoría principal-agente, el análisis de los costos de transacción, etc. En este trabajo retomo el debate de estas preguntas y una crítica de la teoría del "hombre racional". Sostengo que la naturaleza fundamental de la empresa es como un contexto "dirigido" por el ejercicio de la imaginación y el juicio.

Less clear are its managerial implications, either *in toto* or in part. One interpretation is that these economists made considerable progress towards answering Coase's questions. If so, their findings are of great relevance to O&M theorists whose notions of firms and managers' work are often little more than naive, for the Carnegie tradition, that managing is rational decision-making or mere computation, still dominates our literature and teaching. In which case firms are the managers' (and owners') rationally designed apparatus for economic goal seeking. Even if this tradition does little to inform real business practice it fits well with the older Weberian tradition of the firm as a locus of objectivity in the nature of resources and rationality in their

disposition. But the 'new ToF' clearly expands the nature of managing beyond resource allocation to embrace, in principal-agent theory for example, personnel incentive and monitoring costs. The human being as a resource that is problematic, not fully rational, and so needs a different mode of managing is brought back into an analysis that previously took Rational Man as axiomatic, rejecting all other modes of human action. Transaction cost theory is a broader discourse, somewhat tangled, but terms such as 'atmosphere', 'fundamental transformation', and 'contractual incompleteness' move it in the same direction, plus 'real' market characteristics are brought in. Likewise the property rights and nexus of contracts approaches bring the specifics of corporate law and the firm's 'appropriation regime' into the analysis.

But what are the managerial implications of these developments? Is a new model of managing implied? More specifically, does the 'new ToF' concept of managing reach beyond Carnegie-style decision-making, getting beyond criticizing it for being 'unrealistic'? Can the 'new ToF' help

those criticizing business schools' over-attention to rationality? So an alternative reading is that it is an exploration of the different notions of managing implied by its various threads. Not many economists look at it this way, of course, but they seek general theory to which rationality is key - otherwise what they come up with is not economics - while O&M writers are more open to specifics and contingencies as we concede managing might reflect the local culture, the entrepreneur's interests, the legal context (public or private), the firm's type and history, and so on. We move closer to managing as the practice of dealing with unique circumstances, of making something happen.

The human being as a resource that is problematic, not fully rational, and so needs a different mode of managing is brought back into an analysis that previously took Rational Man as axiomatic, rejecting all other modes of human action

In which case the various threads of the 'new ToF' discussion probe various ways in which managing *in situ* differs from Carnegie rationalism and its image of managing *in abstracto*.

2. PRINCIPAL-AGENT THEORY

Perhaps the clearest example of the difference is principal-agent theory (PAT). The framing is well known. A principal wishes her agent to do X - but there is knowledge asymmetry between them that opens up the possibility of 'opportunism', that he acts in his own interest rather than in hers. How should she monitor or incentivize him to act in her interest rather than in his own? This is a venerable question to which we can find references in the Bible, Talmud, or Muquaddimah. In a famous 1976 paper Jensen & Meckling framed the problem in micro economic terms, suggesting there was a formal economic solution that should guide managers facing this problem (Jensen & Meckling, 1976). Their paper created considerable excitement because the PAT relationship seemed to capture something of the firm's essence and suggest a more realistic ToF - since 2007 we have heard a great deal about the 'moral hazards' of bankers' bonuses, a PAT matter. Firms have other essences, of course, implied in their make-or-buy decisions, their contractual behavior, and their legal standing. But principal-agent theory (PAT) reanimated Berle & Means's concerns about business's power (Berle & Means, 1968) and grasped a tension between owners and managers or managers and employees that had to be managed. For micro economist theorists the implication of Jensen & Meckling's paper was that the PAT relationship could be managed by 'rationality alone'. Critics argued rationality or 'prudence alone' could not be sufficient and that human relationships could not be usefully analyzed in such simplistic economic terms (McCloskey, 2010; Spender, 2011). Rational Man is simply not the right place to begin. With suspicions aroused it is useful to re-examine how Jensen & Meckling framed their paper, given it is long and somewhat uneven. One notable feature is their assertion that there can be a single period solution (Jensen & Meckling, 1976:351). Another is their appeal to data generated in 'efficient' markets (Jensen & Meckling, 1976:345). The latter claim is especially curious for in efficient markets all actors are principals and there are no agents. In short the authors' specification actually denied the phenomenon their analysis addressed.

If we go back to the older economic literature on PAT, in Books 4

KEY WORDS

Coase, Knightian uncertainty, strategy, entrepreneurship, managerial judgment, business model

PALABRAS CLAVE

Coase, incertidumbre tipo Knight, estrategia, emprendimiento, juicio directivo, modelo de negocio

and 5 of Adam Smith's *Wealth of Nations*, for instance, we see the management problems of divergent knowledge and interests cannot ever be fully resolved without one or other party being subordinated to or voluntarily adopting the knowledge and interests of the other. Absent this change of mind (and heart) effective management of a PAT situation relies on establishing some workable middle ground, most probably through the actors' mutual learning over several periods of interaction; Anatol Rapoport's tit-for-tat game solution – punish-forgive or win-stay, lose-switch - being one formal statement of this process². Note the crucial inclusion of time, excised in single period solutions. In the O&M literature we highlight the importance of trust, something that takes time to develop, that cannot be purchased in a spot market. (While character references can be purchased, as with credit scores, others for whom history mattered created them). Non-Jensen & Meckling approaches to PAT show trust-creation becomes an objective in and of itself, so clarifying the managerial implications of this thread of the post-Coasian program (White, 1991). Instead of being told to calculate the minimum costs of incentive, oversight, and loss, managers are advised to 'work together - cautiously' – like porcupines.

To help generalize from this example, it is useful to spell out the PAT problem the manager is addressing. Its triggers are the parties' divergent interests and knowledge, a huge shift of emphasis from the neoclassical presuppositions of the Carnegie approach. Instead of all actors standing *pari passu* in a universe of objective fact, wherein knowledge is freely available and certain, when rational analysis seems the best way to go, the 'new ToF' analysis presumes human actors differ and cannot be considered mere atomic 'Rational Men'. Heterogeneity enters. In a limited practical way trust can overcome the opportunistic risks of the actors' differences, bringing them into an ongoing multi-period social relation. Managing is then not simply about optimizing the allocation of resources that can be measured rationally and objectively, but includes getting to grips with their differences and relations. Differences only arise, of course, because we humans never have full knowledge of our situation or that of others, because we are never complete isolates and always have social relations. The 'new ToF' allows that bounded rationality and uncertainty are endemic in social and economic matters (Spender, 2013).

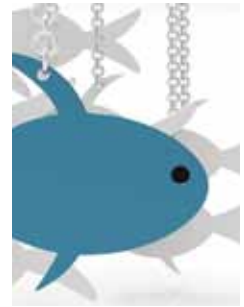
In the background looms the notion that managing is about using judgment to define an incompletely known and maybe unknowable socio-economic-political situation and, second, that it involves the

practice of shaping others' knowledge of and attitudes towards the situation as management have specified it. We quickly disappear down a rabbit-hole into the complex world of 'real managerial practice', and few economists wish to abandon the crutch of rationality and follow. But the general point is that each of the various threads of the 'new ToF' hinges on a posited imperfection that, displacing the analysis from the neoclassical framing, has to be managed with more than 'rationality alone' (Foss, 2002). In PAT the displacing imperfection is the asymmetry of the actors' interest and knowledge. Transaction cost analysis (TCA) is more complicated, embracing PAT as well as other imperfections, including that manifest as the firm's ability to produce at a price less than the market price, or not. In the property rights approaches the imperfection is that which leads to individuals and firms owning what others do not, the puzzle of heterogeneous resource acquisition and distribution tackled in 'strategic factor markets' and explaining Ricardian rent-streams. In the nexus of contracts literature the imperfections revolve around whatever makes spot contracts unworkable and a consideration of time, execution, and incomplete contracts necessary.

3. TAKING IMPERFECTION / UNCERTAINTY SERIOUSLY

Imperfections appear as the surprises the 'real' world holds in store for those who act purposively and intentionally within it - 'mindfully' or 'heedfully' as Weick might say (Weick, 1995). Being unanticipated, surprise is an empirical concept lying beyond what was anticipated, beyond cognition and in the world of practice. Though analysis sometimes reveals unexpected implications of one's assumptions, surprise follows action rather than analysis. Those thinking through well-structured theoretical discourse meet only deductions or errors. Surprises presume something practical - a statement, data, or evidence - that lies beyond that discourse, something mediated by the action that follows expectation³.

Business provides many surprises for many kinds of imperfection arise in real situations. It is replete with uncertainties, unknown-unknowns, and dots not connected. Each imperfection, when identified, indicates a managerial task that lies beyond their rational computational duties in the Carnegie model. Given the manager's eventual choice cannot be evaluated objectively it must be treated as a matter of judgment, an act of managerial (entrepreneurial) imagination and agency even when facts play a significant part in



limiting the manager's strategic options (Spender, 1989). For example there may be several routes between locations A and B. Not knowing the circumstances prevailing on these routes - such as road works or accidents - choosing becomes a matter of judgment. At the same time the possible options are limited by the presence or absence of roads, a matter of contextual fact and by the capabilities and reliability of the actor's means of transportation. The manager's judgment or choice's quality is only revealed *ex post*, in the outcome of its implementation - were you caught in the traffic jam or not? In real world situations chance and uncertainty invariably intervene between *ex ante* analysis and *ex post* experience. As we focus on the latter we shift the analysis of managing from the abstractions of theorizing that presumes full knowledge and computability and into the imperfect world of practice in which business is done. Economic value is only lost or gained here for an economy is a historically institutionalized social practice, neither an abstract concept nor an inanimate object. While this shift does not resolve Coase's questions directly it does suggest it is more productive to address them in a practical milieu, implying that firms are creatures of practice not theory and that there may be no general answers for absent a general theory of market, organizational, or personal imperfection the manager's challenges will be situationally and historically specific and only discovered empirically. Crucially, managers have to select which imperfections to attend to and which to ignore. Time and history matter, as do specifics. The practices that coalesce into a real economy are heterogeneous and discontinuous rather than aspects of a rational and homogenous continuum, as neoclassical economics presumes. Frank Knight famously suggested that profit arose only from engaging a real economy's uncertainties, not as a matter of theory, nor from comparative efficiencies in production, and Coase reiterated this (Jacobsen, 2008; Knight, 1921). There was no 'theory of profit' and, perhaps, no theory of the firm to be found within the neoclassical discourse (Knight, 1942). *Inter alia*, Knight and Coase argued that without uncertainty all gains get competed away instantly as markets clear, leaving no new value. The 'new ToF' focuses on the imperfections that prevent such clearing and thus to the possibility of added value and profit. In which case firms may arise as enterprising managers go beyond rational analysis and apply their judgment to dealing with or even creating imperfections. Firms differ from markets as managed situations for creating value by engaging imperfections

- in contrast to engaging markets that are 'unmanaged', wherein managerial judgment is irrelevant and value cannot be created.

But removal of the 'invisible hand' that manages markets threatens chaos, a free-for-all, the very notion of an economy. The challenge for the 'new ToF' economists introducing imperfection is to explain how economic order might then arise without the visible hand of central economic management, to analyze imperfect competition's macro economic consequences (Dixon & Rankin, 1995). One formulation is to retain the invisible hand at one remove from firms' competitive activity, to presume markets equilibrate as Kirznerian entrepreneurs help re-stabilize markets disturbed by Schumpeterian 'creative destruction' (e.g. Langlois, 2003, 2007). Disturbed markets may well provide entrepreneurs with opportunities to create new value in the equilibration process, perhaps bringing forth the value uncovered by creative destruction - new buildings as slums are cleared, new ideas as old ones are consigned to the ashcan of history.

4. TAKING HETEROGENEITY SERIOUSLY

The 'new ToF' program pays little attention to an earlier group of 'tween-war economists' who pursued the 'theory of the firm' as they pondered imperfect markets, imperfect competition, and their political-economic implications - a group that included Chamberlin, Robertson, Austin and Joan Robinson, and Triffin⁴. No single compelling ToF (of imperfect competition) resulted but the group did much to clarify the nature and impact of economic imperfections. Stiglitz provides a useful list: (a) learning and information heterogeneities and asymmetries, (b) capital market imperfections, and (c) product market imperfections (Stiglitz, 1989). It is also useful to note supply market imperfections, especially in labor markets where there are personal, institutional and national differences in education, skill, and political interest. Likewise Coase drew attention to the costs of learning, rejecting the neoclassical assumption that knowledge and information are free.

Imperfections often lead to 'market power' differences that can be leveraged into economic rents. Given the economic and political concerns of the day the 'tween-war theorists and their later IO brethren focused on how governments might intervene in private firms' attempts to create and 'own' imperfections and transform into monopolies. Following Robertson, who saw firms as "islands of conscious power in this ocean of unconscious (market) cooperation,



like lumps of butter coagulating in a pail of buttermilk" (Robertson, 1928:84), they stressed heterogeneity, to the point each firm could be considered unique and no firm's product or service a perfect substitute for another's. In which case industries are no longer abstractions but fuzzy historically situated socio-economic contexts wherein established firms and entrepreneurs impact each other's fortunes even as they differ in history, goals, style, and resources.

Heterogeneity reflects uncertainty, our inability to see how everything is connected to everything else. Where we find heterogeneity judgment is required to bring things together in an act of judgment and agency. Integration and coordination is necessary. The neoclassical approach implies rationality alone is sufficient for this because the things being considered are commensurate and the consequences of bringing them together can be calculated, things integrate themselves. Taking heterogeneity seriously renders neoclassical notions of 'the market' or 'the economy' irrelevant since, in practice, no such entities can be defined, bounded, or measured. Many analysts move towards the more readily observed firms and the interactions that define markets or economies as socio-economic institutions of inter-firm practice. Seeing firms as less problematic than markets Harrison White, for instance, argued markets are better understood as 'netdoms' of three types of inter-firm interaction: grind, paradox, and crowd (White, 1981, 2002). The implication is that managing is about judging and choosing firm-level interactions, positioning managing within the discipline of business strategy - though White is seldom cited there.

The post-WW2 move towards greater rigor and mathematization eventually pushed imperfect competition and IO economics into the background - whence it was famously recovered and re-deployed into present-day O&M strategy theorizing by Porter (Porter, 1981; Rumelt, Schendel, & Teece, 1991). His 5-force analysis considers the economic actors and interactions that can threaten the focal firm's rent-stream (Spender & Kraaijenbrink, 2011), interactions that characterize one or other of White's netdoms. The firm's nature as an economic actor is taken for granted. Managing is then the strategic process of locating and directing the firm's interactions over successive time-periods within an imperfectly comprehended netdom of inter-firm power and resource differentials.

But once admitted into the analysis, heterogeneity cannot easily be stopped for it equally problematizes the notion of the firm as a

production function. The 'new ToF' differs from the earlier theorizing about imperfect competition because it breaks open the 'black box', something the earlier writers had not done so directly. The recent authors introduce (or re-introduce) additional heterogeneities that must be managed with judgment because the things to be managed are incommensurable. Adam Smith's ToF - the entrepreneurial practice of bringing specific quantities of land, labor and capital together - only has the potential to create new value because these three factors of production are incommensurable and differ in ways theory has not yet clarified. The integration and coordination process are synthetic, for the firm arises from the entrepreneurial judgments that generate the contracts that bring the resources together into specific economic practice. Thus the 'new ToF' embraces incommensurable resources (nexus of contracts), incommensurable people (PAT), and the incommensurabilities between different firms' knowledge and skill as they interact across markets (TCA). These heterogeneities and uncertainties are resolved by the application of entrepreneurial judgment. The argument can be extended and the nature of managerial judgment further clarified by showing that business uncertainties are of several distinct types - ignorance and indeterminacy as well as incommensurability (Spender, 1989, 2014) - and that human knowledge falls correspondingly into three categories; data, meaning, and practice (Spender, 2007).

5. THE FINAL BLOW

Taking Knightian uncertainty seriously ultimately collapses the rationalist notions of economy, market, and firm. But its rampage cannot be stopped there either. It is common to see firms as 'bundles of resources', where these include the factors of production (inputs, including knowledge) and consumption (such as customer loyalty and their willingness to pay over the market price). The puzzle is to see where people then fit in, in spite of the ready way we refer to people as 'a crucial resource'. What we mean, of course, is their knowledge, what they know and do. This leads the analysis away from market-based economic definitions of resources, in terms of cost or market value, and into deeper waters. Whenever the firm is considered a rationally designed purposive apparatus the meanings of its resources are grounded in its goals. Power stations need and value fuel, advertising agencies need and value copy editors, power stations do not value copy editors or vice versa.

Penrose stuck the final blow to rationalist notions of resource with her distinction between the firm's resources and the services they render (Foss, 1999; Jacobsen, 2013; Spender, 1999). This set up a third and very different definition of resource (source of value) and opened up a view of managing that has little to do with the Carnegie view, expanded as that was by the work of Simon, March, and the other creators of the behavioral theory of the firm.

Three points about the Penrosian view of managing; first, the value of a resource is clearly specific to the firm's capacity to transform it into value-adding practice. Second, its value is indeterminate until the firm comes into existence as a practical entity. Third, it follows management's primary task is to create the firm that can create this transformation, not merely to dispose its resources optimally. Resources cannot be understood until the firm has been created. But what is the firm, and what does it mean to speak of its being created? The fatal flaw of analyses that take the nature of the firm for granted - as we have no problem saying IBM or Iberia 'exist' - is that this leads us to miss management's most fundamental task, creating these firms. From the Penrosian point of view the challenge managers face is less that of directing their firm towards its chosen goals (the old notion of strategy) or establishing, protecting or maximizing its rent-streams (the post-Porter notion of strategy) but creating it in the first place. She highlighted the management team's ongoing constructive process, not a decision. Presuming that uncertainties lie at the core of the firm's nature is then doubly challenging for how can uncertainties identified be drawn into an analysis of the management's firm-constructing process? Penrose did not open up this 'black box' and so left Coase's questions unanswered.

Opening it up is the final step towards the firm as a managed process, undetermined by any 'objective' considerations that lie beyond the managerial team's judgments, even as those might be 'facts' that limit the team's options. So long as their choices are not fully determined or determinable, in which case there would be no possibility of profit, such facts can be treated as constraints to their judgment, things to be brought into mind. The interplay of uncertainty and imperfection is illuminating. Stiglitz's summary shows the IO literature presumes imperfections arise from tangible differences in property, associated with Ricardian rents, or differences in knowledge. The implication of Penrose's problematizing the traditional notion of resource is that both constraint and imperfection

are seen to emerge from differences in specific people's learning, and all ultimately collapse into Stiglitz's first category.

Learning is a mystery, of course; we have no general theory of human learning just as we have no general theory of human knowledge. Epistemology explores the contrasts between our limited views, not Truth. So instead of focusing on managing learning the theory of the managed firm can only begin with what has been learned – what appears in place of uncertainty as a result of an act of individual imagination. But what is the nature or meaning of this knowledge? Instead of the rationalist positivist notion that all knowledge is about a coherent and knowable reality beyond our minds (that we can only learn about Nature), Penrose turns towards the phenomenological notion that learning is a process of creating (finding, defining) the human self, which amounts to what we know and can do in the situations in which we find ourselves. In the economic milieu this proficient self is the 'entrepreneurial idea'. There is no explaining the idea's genesis, how Edison was able to 'come up with' the phonograph or Apple to 'come up with' the iPad. Creation and innovation may well be supported by ensuring that there are no factual constraints standing in way of the ideation process (that there are sufficient resources, skills, information and so on) but this is not 'managing innovation' because there is no theory of how support conduces it.



6. FINALLY - THE MANAGED FIRM (TMF)

At this point we see taking uncertainty seriously problematizes all the classical notions of economy, market, firm, and resource - and managing. What more can be said? The rationalist jinni departs with a pouf, leaving a whiff of sulfur, and we face the mystery of human imagination and judgment. If the firm, profit, and economic activity, to say nothing of entrepreneurship and economic growth, are about imaginative engagement with the practical uncertainties of our situation, we can focus our attention on the gap between the entrepreneurial idea and its manifestation as the firm. As a trader and arbitrageur Cantillon focused on the entrepreneurial idea (Tarascio, 1985). Jean-Baptiste Say, in contrast, focused on the creation of the firm as a means to bring the idea into the economy (Long, 1983; Thornton, 2007). Whence and how the entrepreneurial idea arrives is not analyzable; how to transform it into a value-creating netdom is. The rationalist take on this is 'design'. But if the firm can be designed logically it cannot generate economic value; it

is no more than an apparatus to achieve known goals using known resources - and this fails under Knightian uncertainty.

What can be said about how economic value is created? Just as Knight and Coase intuited value comes from engaging the uncertainties of human practice so Adam Smith intuited value comes from successfully engaging the 'division of labor', from exploiting human specialization and the firm-specific learning generated. Cantillon-style entrepreneurs need no help while Say-style entrepreneurs clearly do. In which case the firm is a socially and legally legitimated instrument contrived to compensate for the Say-ian entrepreneur's shortcomings by drawing others with appropriate judgment into enacting the entrepreneurial idea. The continuing growth of the private sector and of private firms reflects the expanding uncertainties the modern economy engages successfully, many arising from increased consumption and raised standards of living, many from science and technology and the increasingly sophisticated products and services we desire to consume (McCloskey, 2006, 2010).

The part of the value-creating firm that can be managed is not idea generation, on which we must be silent. Rather we can discuss the process of leveraging the idea that 'arrives' into a netdom, what many call the firm's business model (BM). Post-Penrose resources can only be understood through the prism of the BM, which is neither a design nor a bundle of resources. Its essence is knowledge; not simply the entrepreneurial idea but knowledge of how this shapes, constrains, and is transformed into practice. Penrose moved beyond 'factual' positivistic knowledge to include what we now call 'tacit' knowledge of experience (Penrose, 1959:53). As we know from Polanyi's quip 'we know more than we can tell' (Polanyi, 1967:4) tacit knowledge cannot be made explicit, written down as a logical statement. When a business model (always unique) synthesizes both explicit and tacit knowledge, it cannot be merely about 'reality' in the positivist sense, nor be readily explicated. Rather it is about how we humans know in ways that shape our actions, what we can make happen. Meaning it is an idiosyncratic language or 'jargon' created to draw others into actualizing the entrepreneurial idea. It is more poem than blueprint. Thus the BM differs from a formula or a logical design as natural language differs from formal language (such as mathematics). It is an artistic artifact; the product of what is perhaps a capitalist democracy's most important art form. The business model that draws in the judgments of others is a language, so the core managerial skills

required to construct and implement the BM are rhetorical. The core of managing is persuasive use of natural language, managerial oratory - no surprise to anyone who has managed or been managed, only to those committed to the aridities of the rationalist program. Hence the post-Coasian program's most fundamental characteristic is its shift from a positivistic discourse of objectivity and rationality into a poetry of economic action, subjectivity, and judgment, a shift that parallels the philosophical move to natural language shaped by 'Continental philosophers' like Wittgenstein, Habermas, and Heidegger (Critchley, 2001; Stainton, 2000). The TMF puts judgment and talk at its core, rejecting the rationalist computational paradigm that still dominates our literature and puts data and analysis at its core.

7. CONCLUSION

Knight's conjecture about the relationship between uncertainty and profit opened up - or recovered - a way to think about the nature of the private firm. Penrose, among others, showed this made it possible to discuss managerial judgment, its growth, and its relationship to value-creation and firm growth. Her first 'law' is that the firm cannot grow faster than the management team's knowledge (Penrose, 1959:44). But her more fundamental contribution was to destabilize the classical notion of resource. This helps us present management analysis in two complementary epistemological and methodological spheres - one positivistic (our discipline's dominant paradigm), the other linguistic and constructive (still an outlier). Useful as the first might be we can only discuss value-creation in the second.

The practical answers to Coase's questions become visible - judgment. Firms exist because they are legally and socially legitimated vehicles for engaging socio-economic uncertainties with entrepreneurial judgment - in the pursuit of private gain. Their boundaries are where they are as matters of judgment - individual and socio-legal. Their internal arrangements are likewise matters of judgment. There are no general theories that can relieve managers of their place and responsibility to make choices, and our discipline's project to develop them is profoundly flawed. Firms' performance varies just as each human's does when we are judged in a social and ethical context. Each firm is likewise unique in its socio-historical situation and the uncertainties it engages. But firm performance also varies because the managerial judgments applied to bridge between the entrepreneurial idea and the BM are so

varied. We can get to practicalities of the TMF, the uncertainties engaged and the managerial judgments applied, by analyzing the BM as a local natural language created to draw in the judgments of those complementing the entrepreneur's (Spender, 2014).

REFERENCES

- Berle, A.A.; Means, G.C. (1968): *The Modern Corporation and Private Property*. New York: Harcourt, Brace & World.
- Coase, R.H. (1937): *The Nature of the Firm*. *Economica* N.S., Vol. 4, num. 16, pp. 386–405.
- Critchley, S. (2001): "Continental Philosophy", *A Very Short Introduction*. Oxford: Oxford University Press.
- Demsetz, H. (1991): *The Theory of the Firm Revisited*. In Oliver E. Williamson & Sidney G. Winter (Eds.), *The Nature of the Firm: Origins, Evolution, and Development* (pp. 159–178). Oxford: Oxford University Press.
- Demsetz, H. (1995): *The Economics of the Business Firm*. Cambridge: Cambridge University Press.
- Dixon, H.D.; Rankin, N. (Eds.). (1995): *The New Macroeconomics: Imperfect Markets and Policy Effectiveness*. Cambridge: Cambridge University Press.
- Foss, N.J. (1999): *Edith Penrose, Economics and Strategic Management. Contributions to Political Economy*, 18 (Special Issue on Edith Penrose's *The Theory of the Growth of the Firm - 40 years after*), pp. 87–104.
- Foss, N.J. (2002): *Edith Penrose, Economics and Strategic Management*. In Christos N. Pitelis (Ed.), *The Growth of the Firm: The Legacy of Edith Penrose* (pp. 147–164). Oxford: Oxford University Press.
- Foss, N.J.; Klein, P.G. (2012): *Organizing Entrepreneurial Judgment: A New Approach to the Firm*. Cambridge: Cambridge University Press.
- Hawkins, C.J. (1973): *The Theory of the Firm*. Basingstoke Hants: Macmillan.
- Jacobsen, L.R. (2008): *On Robinson, Coase, and "The Nature of the Firm"*. *Journal of the History of Economic Thought*, Vol. 30, num. 1, pp. 65–80.
- Jacobsen, L.R. (2013): "On Robinson, Penrose, and the Resource Based View", *European Journal of the History of Economic Thought*, Vol. 20, num. 1, pp. 125–147.
- Jensen, M.C.; Meckling, W.H. (1976): "Theory of the Firm: Managerial Behavior, Agency Costs, and Ownership Structure", *Journal of Financial Economics*, Vol. 3, num 4, pp. 305–360.
- Knight, F.H. (1921): *Risk, Uncertainty and Profit*. Boston MA: Houghton Mifflin Company.
- Knight, F.H. (1942): *Profit and Entrepreneurial Functions*. *Journal of Economic History*, Vol. 2(Supplement: The Tasks of Economic History (Dec.)), pp. 126–132.
- Langlois, R.N. (2003): "Schumpeter and the Obsolescence of the Entrepreneur", *Advances in Austrian Economics*, Vol. 6, pp. 287–302.
- Langlois, R.N. (2007): "The Entrepreneurial Theory of the Firm and the Theory of the Entrepreneurial Firm", *Journal of Management Studies*, Vol. 44, num. 7, pp. 1107–1124.
- Long, W. (1983): "The Meaning of Entrepreneurship", *American Journal of Small Business*, Vol. 8, num 2, pp. 47–56.
- McCloskey, D.N. (2006): *The Bourgeois Virtues: Ethics for an Age of Commerce*. Chicago IL: University of Chicago Press.

- McCloskey, D.N. (2010): *Bourgeois Dignity: Why Economics Can't Explain The Modern World* (Vol. 2 of *The Bourgeois Era*). Chicago IL: University of Chicago Press.
- Penrose, E.T. (1959): *The Theory of the Growth of the Firm*. New York: John Wiley & Sons.
- Polanyi, M. (1967): *The Tacit Dimension*. Garden City NY: Doubleday Anchor Books.
- Porter, M.E. (1981): "The Contributions of Industrial Organization to Strategic Management", *Academy of Management Review*, Vol. 6, num. 4, pp. 609–620.
- Robertson, D.H. (1928): *The Control of Industry*. New York: Harcourt Brace.
- Rumelt, R.P.; Schendel, D.; Teece, D.J. (1991): "Strategic Management and Economics", *Strategic Management Journal*, Vol. 12, Winter Special Issue, pp. 5–29.
- Spender, J.-C. (1989): *Industry Recipes: The Nature and Sources of Managerial Judgement*. Oxford: Blackwell.
- Spender, J.-C. (1999): *Organizational Knowledge, Collective Practice and Penrose Rents*. In Michael H. Zack (Ed.), *Knowledge and Strategy* (pp. 117–132). Woburn MA: Butterworth-Heinemann.
- Spender, J.-C. (2007): "Data, Meaning and Practice: How the Knowledge-Based View Can Clarify Technology's Relationship With Organizations", *International Journal of Technology Management*, Vol. 38, num. 1/2, pp. 178–196.
- Spender, J.-C. (2011): *Human Capital and Agency Theory*. In Alan Burton-Jones & J.-C. Spender (Eds.), *The Oxford Handbook of Human Capital* (pp. 186–217). Oxford: Oxford University Press.
- Spender, J.-C. (2013): *Herbert Alexander Simon: Philosopher of the Organizational Life-World*. In Morgen Witzel & Malcolm Warner (Eds.), *Oxford Handbook of Management Thinkers* (pp. 297–357). Oxford: Oxford University Press.
- Spender, J.-C. (2014): *Business Strategy: Managing Uncertainty, Opportunity, and Enterprise*. Oxford: Oxford University Press.
- Spender, J.-C., & Kraaijenbrink, Jeroen. (2011): *Why Competitive Strategy Succeeds - and With Whom*. In Robert Huggins & Hiro Izushi (Eds.), *Competition, Competitive Advantage, and Clusters: The Ideas of Michael Porter* (pp. 33–55). Oxford: Oxford University Press.
- Stainton, R.J. (Ed.) (2000): *Perspectives in the Philosophy of Language: A Concise Anthology*. Peterborough ON, Canada: Broadview Press.
- Stiglitz, J.E. (1989): "Markets, Market Failures, and Development", *American Economic Review*, Vol. 79, pp. 197–203.
- Tarasio, V.J. (1985): "Cantillon's Essay: A Current Perspective", *Journal of Libertarian Studies*, Vol. VII, num. 2, pp. 249–257.
- Thornton, M. (2007): "Was Richard Cantillon a Mercantilist?", *Journal of the History of Economic Thought*, Vol. 29, num. 4, pp. 417–435.
- Weick, K.E. (1995): *Sensemaking in Organizations*. Thousand Oaks CA: Sage Publications.
- White, H.C. (1981): "Where Do Markets Come From?", *American Journal of Sociology*, Vol. 87, num. 3, pp. 517–547.
- White, H.C. (1991): *Agency as Control*. In John W. Pratt & Richard J. Zeckhauser (Eds.), *Principals and Agents: The Structure of Business* (pp. 187–212). Boston MA: Harvard Business School Press.
- White, H.C. (2002): *Markets from Networks : Socioeconomic Models of Production*. Princeton NJ: Princeton University Press.

NOTES

1. Contact author: ESADE (Universitat Ramon Llull); Av. de Pedralbes, 60–62; 08034 Barcelona; Spain.
2. https://en.wikipedia.org/wiki/Tit_for_tat accessed August 5, 2013.
3. This is the puzzle around empirical testing and the Duhem-Quine thesis. https://en.wikipedia.org/wiki/Duhem%E2%80%93Quine_thesis accessed 5 August 2013.
4. https://en.wikipedia.org/wiki/Industrial_organization accessed 5 August 2013.



Knowledge-Based View of Strategy

La Visión de la Estrategia basada en el Conocimiento

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I. INTRODUCTION

Knowledge creation fuels innovation. This was the central message of *The Knowledge-Creating Company* book Ikujiro Nonaka and I published in 1995, when both of us were at Hitotsubashi University. This book presented a theory on how new knowledge is created through an interactive process known as SECI (Socialization, Externalization, Combination, Internalization: see **Exhibit 1**). We argued that this knowledge-creating process, which came to be known as the SECI model, holds the key to understanding what brings about continuous innovation in firms.

Jiro Nonaka and I are now writing a book that extends our thinking into the field of strategy. We hope to publish this book by 2015, which will mark the twentieth anniversary of the publication of *The Knowledge-Creating Company* book. Jiro Nonaka is still at Hitotsubashi University, but I moved back to the Harvard Business School in 2010 and started teaching a course called Knowledge-Based Strategy within the Strategy Unit of the School. The core content of our new book will be based on what I am currently teaching in this course. This paper provides a preview of our current thinking on the knowledge-based view of strategy.

The knowledge-based view of strategy differs from other schools of thought in strategy in its singular focus on knowledge as the driver of strategy. We define knowledge as a human, dynamic and social process of justifying personal belief towards the truth. Our definition of knowledge differs from the traditional Greek definition of knowledge as justified true belief, which suggests that knowledge is something



EXECUTIVE SUMMARY

Strategy is about future creation. Firms differ not just because they have different value chains and activity systems or different resources and competencies, but because they envision different futures. They differ because people in charge of formulating and implementing strategy have their own visions of the firm's future, which are different from those of other firms. This paper provides a preview of the current thinking on the knowledge-based view of strategy. This view recognizes that an essential feature of strategy is to interpret the particular situation at hand and continuously create the future within the social context. The knowledge-based view of strategy differs from other schools of thought in strategy in its singular focus on knowledge as the driver of strategy. This paper analyses how the knowledge-based view of strategy complements the traditional schools of strategy by injecting new thinking along this three dimensions: putting humans at the center of strategy, treating strategy as a dynamic process, and having a social agenda.

RESUMEN DEL ARTÍCULO

La estrategia hace referencia a la creación futura. Las empresas difieren unas de otras no sólo porque tienen cadenas de valor o sistemas de actividad distintos o porque sus recursos y competencias son diferentes, sino también porque visualizan diferentes futuros. Son distintas porque las personas encargadas de formular e implantar la estrategia tienen sus propias visiones del futuro de la empresa, las cuales son diferentes de una empresa a otra. Este artículo proporciona una previsión del pensamiento actual de la visión de la estrategia basada en el conocimiento. Esta visión reconoce que una característica esencial de la empresa es interpretar la situación actual y crear continuamente el futuro dentro del contexto social. La visión de la estrategia basada en el conocimiento difiere de otras escuelas de pensamiento en estrategia por su singular preocupación por el conocimiento como motor para la estrategia. Este trabajo analiza cómo la visión de la estrategia basada en el conocimiento complementa a las escuelas tradicionales de estrategia por su inyección de nuevos pensamientos sobre tres dimensiones: las personas como centro de la estrategia, la consideración de la estrategia como un proceso dinámico, y por tener una agenda social.

The knowledge-based view of strategy complements the traditional schools of strategy by injecting new thinking along the three dimensions: putting humans at the center of strategy, treating strategy as a dynamic process, and having a social agenda

that is objective, absolute, and context-free. According to our thinking, strategy is created and executed by a subjective, interactive process driven by human beings based on their beliefs and “here-and-now” judgments and actions taken within particular contexts.

“Why do firms differ?” This question has been raised by a number of researchers in the field of strategy. Our answer to this question also sets the knowledge-based view of strategy (KBS) apart from other schools of thought in strategy: firms differ not just because they have different value chains and activity systems or different resources and competencies, but because they envision different futures. To elaborate, they differ because people in charge of formulating and implementing strategy have their own visions of the firm’s future, which are different from those of other firms. In this sense, strategy is about future creation.

This view echoes what Peter Drucker pointed out: we cannot predict the future, but we can *make* the future. *Making* the future requires continuous innovation. The essential feature of innovation, according to Schumpeter, requires a new combination which disturbs the existing static equilibrium. In the eyes of Hayek, a fellow Austrian, market competition is a discovery process of new knowledge of the particular circumstances of time and space, where equilibrium does not exist. Following the intellectual tradition of what we call the Austrian School of thinking, KBS recognizes that an essential feature of strategy is to interpret the particular situation at hand and continuously create the future within the social context.

Three key words – human, dynamic, and social – were included in our definition of knowledge above. They were used to elucidate the following three key features of knowledge: (1) knowledge is created through *human* interactions, (2) knowledge is *dynamic* in its very nature since it is required to create the future but becomes obsolete the minute it is created, and (3) knowledge has a *social* agenda of guiding the firm to do what is good, what is right, and what is just for the firm and for society. The knowledge-based view of strategy complements the traditional schools of strategy by injecting new thinking along the three dimensions described below: (1) putting humans at the center of strategy, (2) treating strategy as a dynamic process, and (3) having a social agenda.

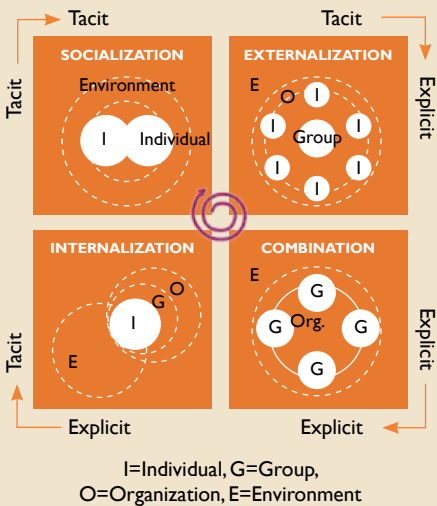
Exhibit 1. **SECI (Socialization, Externalization, Combination, Internalization)**

Sharing and creating tacit knowledge through direct experience (Empathizing)

- 1. Perceiving reality as it is from activities
- 2. Empathizing, resonating, recognizing and foreseeing
- 3. Transferring tacit knowledge

Articulating tacit knowledge through dialogue and reflection (Conceptualizing)

- 4. Articulating tacit knowledge using symbolic language
- 5. Translating tacit knowledge into a concept or prototype



Learning and acquiring new tacit knowledge in practice (Practicing)

- 9. Embodying explicit knowledge through experimenting, hypothesis testing and reflection
- 10. Contemplating in action

Systemizing and applying explicit knowledge and information (Modeling)

- 6. Creating relationship and hypothesis among concepts; analyzing, modeling
- 7. Communicating and sharing explicit knowledge
- 8. Editing and systemizing explicit knowledge

KEY WORDS

Knowledge-based view of strategy, knowledge, human resources, context

PALABRAS CLAVE

Visión de la estrategia basada en el conocimiento, recursos humanos, contexto

2. HUMANS AT THE CENTER OF STRATEGY

The most prominent feature of knowledge, compared with physical resources and information, is that it is born out of human interaction. Knowledge is created by people in their interactions with each other and the environment. Hence, to understand knowledge, we must first understand the interactive process from which knowledge emerges among human beings.

Our view of knowledge is based on Michael Polanyi's concept of knowledge. He argues that human beings obtain new knowledge



through their individual, active, and subjective shaping and integration of experience (which he calls tacit knowing). The power of tacit knowing is exemplified by a metaphor – when on a bicycle, we can instantly synthesize the handlebars, force on the pedals, angle of the body and the bicycle, response of the muscle, and the view in front. The dominant theories of the firm, however, have tended to neglect human subjectivity. This neglect of the human factor has resulted in management theories that treat human beings as another resource, like land and capital. They fail to account for the significance of the human instinct and emotion as well as the context in the management process.

In contrast, good strategies are born from tacit knowledge, according to our thinking. Tacit knowledge is deeply rooted in an individual's actions and bodily experience, as well as in the subjective intuitions, instincts, emotions, and ideals. So, “where does strategy come from?” Steve Jobs, the late co-founder and chairman of Apple, embodied tacit knowledge and utilized it as the origin of his strategy. Walter Isaacson, the author of the book *Steve Jobs*, wrote the following obituary, entitled “The Genius of Jobs,” in *New York Times* on October 30, 2011:

His imaginative leaps were instinctive, unexpected, and at times magical. They were sparked by intuition, not analytical rigor. Trained in Zen Buddhism, Mr. Jobs came to value experiential wisdom over empirical analysis. He didn't study data or crunch numbers but like a pathfinder, he could sniff the winds and sense what lay ahead...

Mr. Jobs could be petulant and unkind in dealing with other people, which caused some to think he lacked basic emotional awareness. In fact, it was the opposite. He could size people up, understand their inner thoughts, cajole them, intimidate them, target their deepest vulnerabilities, and delight them at will. He knew, intuitively, how to create products that pleased, interfaces that were friendly, and marketing messages that were enticing.

In the SECI model, the two types of knowledge – tacit and explicit – interact and interchange with each other through the creative activities of human beings. Of the two, too many managers in the business world tend to rely on explicit knowledge, since it can be easily codified, measured, and generalized. Explicit knowledge is objective and rational knowledge that can be expressed in words, numbers, data, sound, picture, formula, or manual. Dependence

only on explicit knowledge prevents managers from making context-specific judgments and decisions, or the sniff of the winds as Isaacson puts it. Since all social phenomena – including business – are context-specific, analyzing them is meaningless unless one considers people's goals, values, and beliefs along with the power relationships among them.

Knowledge, which resides in an individual, is amplified into organizational knowledge through an interactive process. Organizational knowledge is created through the synthesis of different views of different people in an organization. In KBS thinking, top management, middle managers, and front-line employees all play a part in creating new knowledge. Top management people create the vision or dream and are constantly in search of the “ideal”. Front-line employees are immersed in the day-to-day details of “reality.” It is the middle managers who serve as the bridge between the visionary ideals of the top and the often chaotic reality of those in the front line of business and solve the contradiction through a process called “middle-up-down” management.

The middle-up-down management process highlighted the important role middle managers play in the knowledge creation process. They resolve the contradictions between the “what should be” mindset of top management and the “what is” mindset of the front-line workers by creating mid-range concepts. In this sense, middle managers are the “engineers” of the knowledge creation process. They remake reality according to the company's vision (“what kind of a company do we want to become in the future”). As such, they “engineer” knowledge needed for the future. And since strategy is about future creation, as we mentioned at the outset, middle managers play an important role in formulating and executing strategy as well. This view is in stark contrast to other schools of thought in strategy, which oftentimes ignore them, or worse, treat them as an unnecessary evil.

Since the *Knowledge-Creating Company* book was written, Jiro Nonaka and I have come to realize the important role “*ba*” plays in the knowledge creation process. *Ba* – which is translated as place, space, or field – refers to the context in which human beings interact with each other. People participating in a *ba* share their subjective views, build “here and now” relationships, and try to create new meaning. Think of a pub as an informal example of a *ba*. Here, strangers talk casually about their immediate concerns or problems, sometimes triggering insights or solutions. They see themselves in

relation to others and try to understand each other's views and values inter-subjectively. In essence, *ba* is a shared context-in-motion, with members coming and going, relationships changing, and contexts shifting over time.

Ba can be both physical and virtual. A physical *ba* may take place in a variety of face-to-face settings, such as a training program, a project meeting, an ad hoc study group, a conference, an offsite retreat, a convention, a team-building exercise session, a company-sponsored family or sport event, an informal hobby group, a smoking room, a café or canteen, a karaoke room, or a pub. *Ba* can also take place in virtual settings, such as a video-conference or tele-conference, a social network system, an on-line game, a groupware, or a learning management system.

To create new knowledge, it is necessary to connect various *ba* on a constant basis and link the knowledge created in them, transcending boundaries. An organization in KBS thinking is perceived as a multi-layered network of diverse *ba* intertwined with each other. Ideally, the organizational boundaries across various *ba* should be permeable, with members coming and going and forming self-organizing teams. Since we believe that strategy must be embedded in the organization, we cannot separate out how an organization is structured from strategy. They are linked to each other.

3. STRATEGY AS A DYNAMIC PROCESS

Individuals interact with each other to transcend their boundaries and realize their vision of the future. As a result, they change themselves and others, the organization, and the environment. KBS is characterized by the active creation of change rather than the passive reaction to change. It is based on the belief that firms can shape its environment while they are being shaped by it.

The future to be created by KBS will not be a mere extension of the present. Discontinuity will be the only constant. Everything will be in continuous "flow", including industry boundaries and resource requirements. In such a world, we need managers at all levels to make judgments knowing that everything is contextual, make decisions knowing that everything is changing, and take actions knowing that everything depends on doing so in a timely fashion.

Sam Walton, the legendary founder of Wal-Mart, and Toshifumi Suzuki, the *chuukou-no-so* or a "restorer who came in mid-stream and acted like a founder" of Seven-Eleven Japan, share one common

trait. They both believe that everything is in a flux, that there could be no fixed way of doing business. A close friend of Sam Walton recalled the many occasions when Sam was asked to reveal the secret of his success, but Sam would tell a different secret every time. Indeed, his friends cited Sam's agility as one of his most endearing traits. People close to him chuckled that "Change" was his middle name.

Toshifumi Suzuki also emphasized flexible thinking. He believed that there was no sense in trying to create a long-term plan under conditions of short-term change. He warned employees not to dwell on past success because they might overlook opportunities that required a new way of thinking. He did not advocate ignoring past experience, but rather, making experience the raw material to generate new hypotheses that suited the "here-and-now" situation. He constantly told his front-line employees to place orders for items that they believed will sell in the future, not items that sold well in the past.

Jiro Nonaka and I used the "rugby" metaphor to describe this agile world, using new product development as a case in point. As in rugby, the ball gets passed around within the team as it moves up and down the field (ba) as a unit. The ball gets kicked around when the players pose for the "scrum". The ball does not move in any defined or structured manner; ball movement is unpredictable and the players have to make judgments on the spot ("here and now").

In addition to being agile, KBS assumes that the real world is filled with contradictions, opposites, and paradoxes. KBS synthesizes them through the use of dialectic thinking derived from Hegel. This dynamic process is composed of three stages of development: a thesis, which gives rise to its reaction, an antithesis, which contradicts or negates the thesis, and the tension between the two being resolved by means of a synthesis. Over time, however, synthesis eventually turns into becoming the thesis, which forces another round of thesis-antithesis-synthesis resolution. This continuous process can be visualized as a spiral.

The concept of "spiral" is used to depict the dynamic nature of KBS at different levels. At the epistemological level, new knowledge is created by a dynamic interaction of tacit and explicit knowledge through the SECI spiral. At the ontological level, knowledge developed at the individual level is transformed into knowledge at the group, organizational, and community levels. The truly dynamic nature of KBS can be depicted as the synthesis of these two spirals over time, in which the interaction between tacit and explicit knowledge is





amplified as it moves up the ontological level. This dynamic process fuels innovation.

The more turbulent the times, the more contradictions there are. As a result, corporate success has never been more fragile. Only a few companies have proven themselves capable of changing as fast as the environment around them and dealing with complexities surrounding them. One of the main reasons why companies fail today is their tendency to kill contradictions, opposites, and paradoxes by sticking to old routines created by their past success.

Toyota faced two horrific setbacks in recent years: the first being the massive recall in the 2009-2010 period ignited by accidents caused by cars that ran out of control and couldn't be braked to a stop in the U.S., and the second being the production disruption caused by the March 11, 2011 earthquake and tsunami in the Tohoku region. The company has recovered from these crises relatively unscathed, partly because it was able to discard old routines (e.g., shrinking the board by half and taking out layers of management) and to connect emotionally with customers through its products.

Toyota was also able to get back on track in a short period of time because of its ability to harness the negatives as a wake-up call to energize itself. Facing contradictions, opposites, and paradoxes have always been a way of life within Toyota. The company is known for moving forward gradually while also advancing in big leaps. It is frugal with its resources while spending extravagantly on people and projects. It is both efficient and redundant. It cultivates an environment of stability as well as paranoia. It is hierarchical and bureaucratic, but encourages dissent. It demands that communication be simplified while building complex communication networks that are analog in nature. Being accustomed to dialectic thinking came in handy for the company during times of crisis.

4. SOCIAL AGENDA OF STRATEGY

A firm creates value to society by asking and answering on a daily operational basis the question, "Why do we exist?" The answer to this question sets KBS apart from other schools of thought. According to KBS thinking, firms exist to improve the human condition and to create a better future. A firm creates a better future not only by maximizing profit for shareholders, but also by serving the common good of its employees, its customers, its suppliers and other stakeholders as well as the society at large, including the environment.

The environment is in the minds of the founding fathers of Shimano, the bicycle components company with a high worldwide share in both the road bike and mountain bike segments, whose mission statement reads as follows: To promote health and happiness through the enjoyment of nature and the world around us. The customer is what Walt Disney had in mind when he first wrote down the company's mission back in the 1920s: Create universal, timeless family entertainment. The employee is also what Marvin Bower, a *chuukou-no-so* of McKinsey & Company, had in mind when he established Our Mission over two decades ago as: To help our clients make distinctive, lasting, and substantial improvements in performance and to build a great Firm that attracts, develops, excites, and retails exceptional people. Society at large is what Tadashi Yanai, the founder and CEO of Fast Retailing that operates UNIQLO stores, has in mind with the following mission statement: Changing clothes, changing conventional wisdom, changing the world.

According to the KBS view, the firm has to have its own future-building vision on how it would like to be in the future and how it would like to change society in the future. This vision should not simply be an extension of the present, but be closer to a leap towards fulfilling a dream or an ideal. A vision holds meaning when people in top management put their heart and soul into creating one that is unique to the firm; also, when they repeatedly share their vision with people inside and outside the firm. Inside the firm, the use of a formal system of apprenticeship is useful in sharing their experiences, contexts, and time with employees at all levels. The use of stories and metaphors is also useful in expressing the difficult-to-articulate essence of that vision.

A firm also creates value to society by asking and answering on a daily basis another question, "What is good?" We draw on Aristotle's concept of *phronesis* to show how values, aesthetics, and ethics are an integral part of strategy. *Phronesis*, which is commonly known as practical wisdom or prudence, can be interpreted as the higher-order tacit knowledge acquired from practical experience that enables humans to make prudent judgments and take timely action appropriate to a particular context and situation, guided by values, aesthetics, and ethics. Aristotle identified two other forms of knowledge: *episteme* and *techne*. In contrast to *episteme* (universally valid, scientific knowledge or "know-why") and to *techne* (skilled-based technical "know-how"), *phronesis* is "know-what-should-be-done" for the common good.

The embracing of *phronesis* into strategy allows the firm to create another spiral at the teleological (purpose) level. *Phronesis* spirals up the synthesis of tacit and explicit knowledge by guiding the firm to do what is good, what is right, and what is just for the firm and for society. Doing so elevates strategy from something objective, analytical, and profit-driven to something akin to a calling from on high.

When Honda was developing the CVCC engine, a low-emission engine that would meet a revised Clean Air Act in the U.S. in 1970, the founder of the company Soichiro Honda said that it would put the car company in a position to beat out the Big Three, who opposed the new law. But Honda engineers objected to Soichiro, suggesting that they were developing the engine to make the world a better place by reducing harmful emissions. They went to say that they were doing it for their children. As the story goes, Soichiro was so ashamed of himself when he heard this that he decided it was time for him to retire.

5. IN CONCLUSION

In the knowledge-based view of strategy, firms differ because they envision different futures. The practical wisdom to be drawn out of this paper is three-fold:

1. We know that we cannot predict what the future holds, but we know that humans can *make* the future
2. We know that discontinuity is the only constant awaiting us in the future, but we know that we can proactively and dynamically embrace it
3. We know that the narrow view of capitalism – which pits business against society – has not worked, but we know that the future to *make* must be based on a new form of capitalism based on *phronesis* – which is focused on creating both economic value and social value.

REFERENCES

- Aristotle (2002): *Nicomachean Ethics*. Broadie, S. and Rowe, C. trans. New York, NY: Oxford University Press.
- Drucker, P.F. (1993): *Post-Capitalist Society*. Oxford: Butterworth Heinemann.
- Hayek, F.A. (1978): *New Studies*. Chicago, IL: University of Chicago Press.
- Hegel, G.W.F. (1969): In Miller, A.V. trans. *Science of Logic*. Amherst, NY: Humanity Books.
- Nonaka, I.; Takeuchi, H. (1995): *The Knowledge-Creating Company: How Japanese Companies Create the Dynamics of Innovation*. New York, NY: Oxford University Press.
- Nonaka, I.; Takeuchi, H., (2011): *The Wise Leader*. *Harvard Business Review*, May 2011, Vol. 89, num. 5, pp.58–67.
- Nonaka, I.; Toyama, R.; Hirata, T. (2008): *Managing Flow: A Process Theory of the Knowledge-based Firm*. Basingstoke: Palgrave Macmillan.
- Nonaka, I.; Takeuchi, H. (forthcoming): *Knowledge-Based Strategy*. Teece, D. and Augier, M., *The Palgrave Encyclopedia of Strategic Management*. Basingstoke: Palgrave MacMillan.
- Osono, E.; Shimizu, N.; Takeuchi, H. (2008): *Extreme Toyota: Radical Contradictions that Drive Success at the World's Best Manufacturer*. Hoboken, NJ: John Wiley & Sons.
- Polanyi, M. (1958): *Personal Knowledge*. Chicago, IL: University of Chicago Press.
- Schumpeter, J.A. (1912): *The Theory of Economic Development*. Opie, R. trans. Cambridge, MA: Harvard University Press.
- Takeuchi, H.; Nonaka, I. (1986): *The New New Product Development Game*. *Harvard Business Review*, January-February: pp.137–147.
- Takeuchi, H.; Nonaka, I. (2004). *Hitotsubashi on Knowledge Management*. Hoboken, NJ: John Wiley & Sons.
- Teece, D. (2008): 'Foreword: From the Management of R&D to Knowledge Management', in Nonaka, I., Toyama, R. and Hirata, T. *Managing Flow: A Process Theory of the Knowledge-based Firm*. Basingstoke: Palgrave MacMillan.

NOTES

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The Search for Externally Sourced Knowledge: Clusters and Alliances

La Búsqueda de fuentes de Conocimiento
externas: Clusters y Alianzas

80



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I. INTRODUCTION

In the technology-intensive, communication-rich global marketplace, firms have come to rely increasingly on external sources of technical and organizational knowledge in the race to generate competitive advantage through innovation.

Two major sources of external knowledge are alliance networks and geographical clusters, either independently or in combination. In some ways, the technologically close combinations of firms that form alliance networks function much like the geographically close groups of firms that form clusters. In other ways, though, the ties that create these loosely organized groups are quite different, resulting in considerable disparity in how knowledge spreads across each of them. In practice, global network firms are learning to build joint knowledge stocks by relying on contractual partners based in dense clusters in many locations around the world.

As scholars compare alliance networks explicitly with clusters as sources of external knowledge, these similarities and differences are being identified and addressed to better understand when, how, and why firms would use one or the other, or both, approaches to

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EXECUTIVE SUMMARY

External sources of knowledge have become more important to firms as they have dispersed their value-adding operations around the globe and outsourced them to alliances. The global network firm has access to a rich store of external knowledge – but what do we know about accessing this treasure trove? The purpose of this paper is to summarize key ideas behind the research on alliance networks with clusters to better understand when, how, and why firms would use one or the other, or both, approaches to accessing external sources of knowledge, and to suggest new directions for both practice and scholarship.

RESUMEN DEL ARTÍCULO

Las fuentes externas de conocimiento son cada vez más importantes para las empresas, en la medida en que éstas han dispersado las actividades que les generan valor a lo largo del planeta y las subcontratan a través de alianzas. La empresa red global tiene acceso a un rico acervo de conocimientos externos -pero ¿qué sabemos sobre cómo acceder a este tesoro? El propósito de este artículo es resumir las ideas principales de la investigación en redes de alianzas dentro de clusters para entender mejor cuándo, cómo y por qué las empresas utilizan uno u otro, o ambos enfoques para acceder a fuentes externas de conocimiento, así como proponer nuevas orientaciones tanto para la práctica como para la academia.

accessing external sources of knowledge. The purpose of this paper is to summarize key ideas behind such research and to suggest new directions for both practice and scholarship.

2. KNOWLEDGE

To understand the mechanisms of external knowledge capture, we must first distinguish types of knowledge. A common dichotomy is that between explicit or codified knowledge and tacit or uncodifiable knowledge. This typology suggests a clear distinction, but other work suggests that all knowledge is to some extent explicit and to some extent tacit (Brown & Duguid, 1991). I have found that a

distinction based on the scope of any particular knowledge is perhaps more revealing. Building on the work of Henderson and Clark (1990), we have extended the idea of component knowledge, which addresses the value-adding processes of the firm, and architectural knowledge, which focuses on the organization and direction of these processes (Tallman, Jenkins, Henry & Pinch, 2004). Component knowledge runs from highly technical and explicit to conceptual and often tacit, but can be reduced to ever more codified forms through inquiry, observation, and testing. Most of the external knowledge that firms gather, as well as that typically studied in scholarly research on organizational learning, is component knowledge. This is the basis, for instance, of Nonaka's (2007) discussion of making tacit knowledge explicit for transmission and

incorporating this explicit knowledge into new processes to return it to a more tacit state when used, as for instance by building a business model in one market and transferring the documentation to another subsidiary.

Architectural knowledge, on the other hand, is deeply embedded in the organization, is very much path dependent, and is largely (or at least the important parts of it are largely) tacit in nature. Architectural knowledge develops through practice, and common architectural understandings develop in two or more organizations through common or shared practice, not through a process of codification and de-codification. Finally, shared architectural knowledge clearly increases mutual absorptive capacity for component knowledge or technologies (Tallman et al., 2004), as organizations that have common architectures will place the same value on pieces of

In practice, global network firms are learning to build joint knowledge stocks by relying on contractual partners based in dense clusters in many locations around the world

component knowledge and apply them in very similar fashions. These aspects of knowledge are important to any discussion of how firms go about accessing externally sourced knowledge.

3. ALLIANCE NETWORKS

In management studies, access to external knowledge has until fairly recently been focused on cooperative strategies – the use of joint ventures and alliances. When firms do not have the knowledge resources that they need to pursue new products or processes, they have the options of internal development, acquisition in the market for knowledge or organizations, or allying with another organization that does have the needed knowledge (Madhok & Tallman, 1998). Internal development is slow, uncertain, and expensive; acquisition in the market is fast but generally restricted to commonly available commodity-like knowledge; acquisition of another firm is fast, but expensive and encumbered with unrelated considerations. Alliances, whether equity-based or contractual, are relatively fast to execute, relatively inexpensive, and relatively focused on the item at hand. In addition, they allow the parties to the transaction to continue about their separate businesses in all other activities.

Alliances or networks of alliances bring together firms with multiple complementary stocks of knowledge, allowing them to both combine inputs as a part of the alliance and often to internalize at least some part of each other's knowledge. Alliances, particularly those organized as contracts, are typically arranged to combine component knowledge. However, firms do undertake longer, more involved relationships for the purposes of combining architectural inputs as well. Evidence seems to suggest that such cooperative ventures, characterized as having multiple objectives, involving multiple value-adding steps (R&D, manufacturing, marketing), or having product development goals, are best organized as equity joint ventures that have separate identities, workforces, and strategies (Phene & Tallman, 2012). In successful EJVs, new architectural knowledge (often characterized as capabilities) will arise over time, giving incentives for stability and adding value that cannot be captured directly by either parent.

Alliances of all sorts, even those with explicit production goals, involve sharing (if not explicitly exchanging) knowledge. The contracts on which they are based typically specify what knowledge will be exchanged, what limits will be placed on partner access,

KEY WORDS

External sources of knowledge, alliances, clusters, networks

PALABRAS CLAVE

Fuentes externas de conocimiento, alianzas, clusters, redes



and how component knowledge developed in the alliance will be made accessible to the partners. The idea that alliances can involve opportunistic learning races (Hamel, 1991) between the partners has been popular, indeed, when expressed as the need for mutual hostages to good behavior (Hennart, 1988), is often treated as the primary reason behind EJVs – at least from a transaction cost economics perspective. Studies of alliance contracting and many real cases in which firms rely on contracts for essential operations (Apple, Nike and other firms that rely on offshore outsourcing contracts for manufacturing come to mind) suggest that equity is not, or at least no longer, seen as essential to reliable partnerships. Recent studies (Phene & Tallman, 2012) provide evidence that equity joint ventures are motivated by the need for improved coordination in strategically complex situations, but show little support for the idea that fears of misappropriation of component-type knowledge by the partner drive the governance forms of alliances.

However, it does seem to be the case that alliance networks still raise concerns for the loss of essential knowledge. One study suggests that firms with stronger internal capabilities that are involved in alliance networks tend to gain less from stronger alliance portfolios than do weaker firms (Srivastava & Gnywali, 2011). The bargaining power literature suggests that stronger firms have both more to potentially lose to partners and more power to control the terms of the contract (Yan & Gray, 1994). It does seem that real firms recognize this. Of course, excessive fear of unintended spillovers of knowledge to a partner can lead to a contract that restricts knowledge sharing so much that the objective of discovering and exploiting complementarities is limited and the alliance fails to accomplish its objectives. Finding the right balance of fear and hope challenges joint activities in all aspects of life, to include organizational alliances.

4. CLUSTERS

Another source of external knowledge, one only recognized in management studies recently, is membership in a local cluster of firms in related and supporting industries (Porter, 1998). Clusters, or industrial districts as they are commonly known in economic geography, have been recognized within that field for somewhat longer (Piore & Sabel, 1984). Clusters are said to have a variety of potential benefits for member firms: locally specialized infrastructure, skilled regional work forces, short shipping distances, social

networking that can increase trust and reduce opportunism risks, and so forth. A critical benefit, though, is the existence of ‘untraded interdependencies’, or knowledge exchanges taking place without economic transactions (Storper, 1995). These interdependencies are commonly referred to as knowledge spillovers (Zucker, Darby & Armstrong, 1998), and have come to be seen as a key identifier of clusters. Spillovers are defined as unintended and uncompensated transfers of knowledge from one firm to another (Phene & Tallman, 2012b). In a cluster, spillovers have the effect of moving knowledge from the private to the locally public sphere; that is, knowledge spillovers tend to be available to all firms in the cluster. The very fact that this knowledge is mobile categorizes it as component knowledge, often either hard technology or process knowledge. Architectural knowledge can also be shared in clusters, but develops among clustered firms as they engage in multiple cooperative and competitive interactions over time.

The impact of knowledge spillovers on the firms within a cluster has been assessed and reassessed many times. The driver of membership in clusters is often said to be access to spillovers from other firms and associated institutions such as local universities (Zucker, et al., 1998). Studies of clusters suggest that firms within clusters tend, as a group, to outperform isolated firms. However, some studies suggest that larger, stronger multinational firms tend to avoid locating among concentrations of firms in their own industry (Shaver & Flyer, 2002). This outcome has been widely interpreted to suggest that firms with more knowledge to lose through potential outward spillovers as compared to the possible value of incoming spillovers tend to avoid clusters. On the other hand, recent empirical evidence suggests that highly innovative firms gain more from being in highly innovative clusters than do weaker firms (Srivastava, Gnyawali & Tallman, 2010). Additional research (Phene & Tallman, 2006) suggests that spillovers of knowledge tend to encourage alliance ties within clusters in patterns that suggest that stronger recipient firms minimize formal contacts.

Overall, it appears that the concept of absorptive capacity (Cohen & Levinthal, 1990) is relevant to firms operating in an environment where spillovers of formerly private knowledge are commonly available. That is, weaker firms tend to seek out such locations, but stronger firms tend to be able to take better advantage of such semi-public knowledge to increase their own performance

without engaging in more formal ties. The nature of spillovers suggests that they will consist of fragmentary, poorly developed, potentially uncertain component knowledge. Strong firms that pick up new concepts can use their internal resources to take maximum advantage of these innovations, while weaker firms within a cluster may well acquire the same available bits of knowledge, but will struggle to make sense of them or to combine them with their private knowledge into important innovation. Because spillovers do not involve formal interactions by definition, the defensive aspect described above in alliance relationships is less likely to be relevant in clusters. If firms are part of the cluster, they will be able to access spillovers. Whether or not they are able to effectively integrate incoming spillovers, they will still find that their own private component knowledge will leak out. If firms wish to avoid spilling knowledge to real or potential competitors, they must simply avoid investing in clusters or perhaps move their facilities elsewhere. If they stay in the cluster, they must know that attempting to over-control knowledge leaks is both impossible and will do more damage by keeping the firm outside the local knowledge network, so that it will tend to be isolated from other spillovers.

Overall, clusters provide a less-certain opportunity for external knowledge access, and do not offer the support of formal processes the way that alliance networks do. On the other hand, clusters offer free, or at least payment-in-kind, access to a wide variety of information relevant to their own innovative potential. Strong firms need to monitor their knowledge exchange ties, but should ultimately gain more from cluster-level knowledge than will their weaker co-cluster members. If they feel that they put too many of their own essential resources on the line by being within a cluster.

5. ALLIANCES AND CLUSTERS

Discussion of alliances and clusters separately as sources of external knowledge that can be accessed and absorbed by firms in search of innovation is common, but simplified. Contrary to the early model of clusters expressed in economic geography, clusters do not typically consist of a homogenous collection of small firms, each fully embedded in a social and economic network. Rather, many clusters, perhaps particularly in technology-intensive industries, are organized as sets of alliances (Tallman & Jenkins, 2002). Groups of suppliers tend to develop around 'lead firms', usually larger firms

that produce final goods and sell them to customers outside the cluster. Competition within the cluster takes place between these vertical groups, focused on the horizontal interactions of the lead firms, rather than between firms at all levels of the local value-adding chain (Maskell, 2001). What mechanisms lead toward this differentiation within clusters? Suppliers tend to develop in areas of concentrated economic activity, and supply relationships seem often to become co-specialized as the firms work together over time. The descriptions by Dyer and various co-authors of the development of the Toyota vertical keiretsu in Japan (e.g., Dyer & Hatch, 2004) provide a classic example of vertical co-specialization in action. Toyota was the only lead firm in its Toyoda City cluster, but similar, if less extensive and formal, processes are at work in supply networks in more competitive clusters as well. Evidence also suggests (Phene & Tallman, 2006) that when firms take note of spillovers within clusters, originating firms have a tendency to seek alliances with firms that cite their patentable component knowledge. Recipient firms, however, tend to avoid alliances with firms whose knowledge they cite, a condition exacerbated inside clusters. These tendencies suggest that originating firms would prefer to access the returns to their knowledge that is lost through uncompensated spillovers by setting formal ties that presumably include some form of licensing or other compensation. Recipients of spillovers, particularly within clusters where a common architectural knowledge base increases absorptive capacity (Tallman et al., 2004), have no reason to want to share their returns on freely obtained knowledge spillovers and are less likely to need access to the complementary knowledge that the originator might still hold privately.

We see that recent empirical research suggests that firms in alliances tend to hold their partners at a distance through contracting arrangements and operational expectations, apparently in fear that knowledge beyond that specifically contracted for will leak to the partner. Stronger firms seem to benefit the least from strong partners, suggesting that weaker partners may be more open in alliances in the hope of establishing two-way flows of knowledge from which they would hope to gain more than they lose (Srivastava et al., 2010). In clusters, however, the unintended nature of spillovers makes restrictions irrelevant – firms may try to limit opportunities for leaks, but a spillover by definition has bypassed any controls. In this situation, all firms try to limit outward leaks, but are alert to incoming





spillovers from others. Stronger, more innovative firms should have greater capacities for absorbing and incorporating such spillovers into meaningful innovation than will their weaker co-located firms. If we consider that much of such leakage will be of component knowledge within a supply chain, these results suggest that the final product firm is likely the larger, stronger, more externally focused partner and is likely to gain more than its suppliers. The suppliers would have an incentive to seek long-term contracts in order to benefit from their knowledge more fully, and the lead firm, while not necessarily needing more knowledge inputs, may be willing to lock in partners to reduce future bargaining and perhaps for future joint development projects. Thus, what start as arms-length contracts are likely to evolve into vertical supply networks of alliances. In vertical clusters with a single lead firm, suppliers may have little choice about accepting formal ties – indeed, they presumably locate in the area with this expectation. In technology clusters with multiple competing lead firms, the desire to build joint technology or product development ties without worrying about leakage to other lead firms via shared suppliers suggests that formally organized networks are again likely. Except in the case of the smallest, most traditional clusters, the use of alliances to stimulate knowledge development and to protect innovations from premature leakage seems to suggest that complex internal network structures are to be expected in regional clusters.

6. CONCLUSION

What is to be learned from research into external knowledge sourcing that might be useful to practice? First, it is clearly the case that firms around the world are engaged in dispersing their value-adding operations through both outsourcing of previously internal operations and through moving operations to more productive locations. Outsourcing is built on networks of contractual alliances that are integrated with the wholly- and partially-owned subsidiaries of the firm and that bring intermediate goods and business services and also novel knowledge into the firm. To make the most of global logistic nets, multinational firms must engage their partners in knowledge combination and creation, not just permitting them to perform their own activities with minimum performance but encouraging them to be integral parts of the larger knowledge network that makes up what might be called ‘the strategic firm’. To

make this happen, the powerful global multinationals that control these networks need to overcome their reluctance to expose their own knowledge to partners. Every indicator is that opportunistic strategies are becoming rapidly obsolete in an information-intensive world. Firms in networks need to look to the advantages of more active combination and recombination of knowledge (Kogut & Zander, 2002) within the network rather than the risks of some proprietary know-how leaking to a partner. The motto needs to be: 'if it is important enough to leak, it is important enough to share.' That is, licensing knowledge that is needed to make the alliance transaction successful, and which demands for efficiency will eventually pull into the open, protects the value of the knowledge even as the details are revealed. Secrecy limits the ability to make the most of an idea, while only slowing but never stopping its eventual loss.

This same movement of value-adding activities into global networks makes clustering more relevant. Value creation, once separated from value delivery to the market for that value, should be established in the most productive location available. It appears that in most industries, such locations are the homes of industry clusters. Local competition drives aggressive pricing. Cooperation, short supply lines, and trained workers drive lower costs. Shared knowledge keeps innovation sharp. Multinational firms need their subsidiaries – or at least their suppliers – to be among the lead firms in critical clusters. Not only should these provide a local foothold and access to cost-efficient value production, but they should also allow the multinational to tap indirectly into the knowledge of goods, services, and technology that has developed in any cluster. By engaging actively in stronger knowledge clusters, strong firms benefit greatly, and not just in the cluster.

Thus, access to and sharing of externally-sourced knowledge is essential to economic success in technology-intensive, globalizing industry sectors. Focus on protecting static know-how from partners must shift to recognition that knowledge sharing is a necessary two-way activity, and that the speed of knowledge development in this world makes inefficient recombination a much greater strategic risk than uncompensated spillovers. Firms need to act on this understanding and scholars need to recognize that the truisms of 30 years ago do not reflect the realities of today's international marketplace.

REFERENCES

- Brown, J.; Duguid, P.P. (1991): "Organizational learning and communities of practice: Toward a unified view of working, learning and innovation", *Organization Science*, Vol. 2, num. 1, pp. 40–57.
- Cohen, W.M.; Levinthal, D.A. (1990): "Absorptive capacity: a new perspective on learning and innovation", *Administrative Science Quarterly*, Vol. 35, pp. 128–152.
- Dyer, J.H.; Hatch, N.W. (2004): "Using supplier networks to learn faster", *MIT Sloan Management Review*, Vol. 45, num. 3, pp. 57–63.
- Hamel, G. (1991): "Competition for competence and inter-partner learning within international strategic alliances", *Strategic Management Journal*, Vol. 12, Summer SI, pp. 83–103.
- Hennart, J.-F. (1988): "A transactions cost theory of equity joint ventures", *Strategic Management Journal*, Vol. 9, num. 4, pp. 361–374.
- Henderson, R.; Clark, K. (1990): "Architectural innovation: The reconfiguration of existing product technologies and the failure of established firms", *Administrative Science Quarterly*, Vol. 35, pp. 9–30.
- Kogut, B.; Zander, U. (1992): "Knowledge of the firm, combinative capabilities, and the replication of technology", *Organization Science*, Vol. 3, num. 3 pp. 383–397.
- Madhok, A.; Tallman, S. (1998): "Resources, transactions and rents: Managing value through interfirm collaborative relationships", *Organization Science*, Vol. 9, num. 3, pp. 326–339.
- Maskell, P.P. (2001): "Towards a knowledge-based theory of the geographical cluster", *Industrial and Corporate Change*, Vol. 10, pp. 921–943.
- Nonaka, I. (2007): "The knowledge-creating company", *Harvard Business Review*, Vol. 85, num. 7/8, pp. 162–171.
- Phene, A.; Tallman, S. (2012): "Complexity, context and governance in biotechnology alliances", *Journal of International Business Studies*, Vol. 43, pp. 61–83.
- Phene, A.; Tallman, S. (2006): "Firm learning in regional clusters: An evolutionary process of knowledge exchange", Paper presented at the Academy of Management Annual Conference, in Atlanta.
- Piore, M.; Sabel, C. (1984): "The Second Industrial Divide", Basic Books: New York.
- Porter, M.E. (1990): "Clusters and the new economics of competition", *Harvard Business Review*, Vol. 68, Nov-Dec, pp. 77–90.
- Shaver, M.; Flyer, F. (2002): "Agglomeration economies, firm heterogeneity and foreign direct investment in the U.S". *Strategic Management Journal*, Vol. 21, num. 12, pp. 1175–1184.
- Srivastava, M.K.; Gnyawali, D.R. (2011): "When do relational resources matter? Leveraging portfolio technological resources for breakthrough innovation", *Academy of Management Journal*, Vol. 54, num. 4, pp. 797–810.
- Srivastava, M.K.; Gnyawali, D.R.; Tallman, S. (2010): "Differential impact of alliance network and cluster technological resources on breakthrough innovation", 2010 Academy of Management Conference Best Paper Proceedings.
- Storper, M. (1995): "The resurgence of regional economies, ten years later: the region as a nexus of untreded interdependencies", *Journal of European Urban and Regional Studies*, Vol. 2, pp. 191–221.
- Tallman, S.; Jenkins, M. (2002): "Alliances, knowledge flows, and performance in regional clusters", In F. Contractor & P.P. Lorange, eds., *Cooperative Strategies and Alliances*, pp.163–188. Elsevier Science: Oxford.
- Tallman, S.; Jenkins, M.; Henry, N.; Pinch, S. (2004): "Knowledge clusters and competitive advantage", *Academy of Management Review*, Vol. 29, num. 2, pp. 258–271.
- Yan, A.; Gray, B. (1994): "Bargaining power, management control, and performance in United States-Chinese joint ventures: a comparative case study", *Academy of Management Journal*, Vol. 37, num. 6, pp. 1478–1517.
- Zucker, L.; Darby, M.; Armstrong, J. (1998): "Geographically localized knowledge: Spillovers or markets?" *Economic Inquiry*, Vol. 36, num. 1, pp. 65–86.

NOTES

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The Development of Knowledge Management in the Oil and Gas Industry

El desarrollo de la Dirección del Conocimiento
en la industria del petróleo y gas

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I. INTRODUCTION

Since the early 1990s, interest in knowledge management has been spurred by accelerating rates of technological and market change that have resulted in innovation and learning becoming increasingly important for business success and by rapid advances in information and communications technology (ICT) offering greater opportunities for exploiting the knowledge available to organizations. The oil and gas industry has been at the forefront of both the development and deployment of knowledge management techniques as a result of several factors:

- Technological and market changes in the petroleum sector became increasingly intense during the 1990s and first decade of the 21st century. The pressures resulting from the depletion of established fields, the need to explore in frontier locations (especially in deep waters), and pressures for greater environmental responsibility provided massive impetus for technological advance. Upstream technologies have moved especially rapidly especially in relation to seismology, drilling technologies, and offshore E&P.

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EXECUTIVE SUMMARY

A review of the knowledge management experiences of BP, Royal Dutch Shell, Chevron, ExxonMobil, ConocoPhillips, Halliburton, Schlumberger, Paragon Engineering Services, BHP, Marathon Oil, and Murphy Oil identified two major types of knowledge management practices: applications of information and communications technology to the management of explicit knowledge and the use of person-to-person knowledge management techniques to facilitate the transfer of tacit knowledge. The study pointed to the challenges of converting tacit into explicit knowledge and the importance of knowledge management initiatives that combined the enthusiasm of bottom-up initiatives with strong top-down support from senior management.

RESUMEN DEL ARTÍCULO

Una revisión de las experiencias en gestión del conocimiento de las compañías BP, Royal Dutch Shell, Chevron, ExxonMobil, ConocoPhillips, Halliburton, Schlumberger, Paragon Engineering Services, BHP, Marathon Oil, y Murphy Oil identifica dos tipos de prácticas principales de gestión del conocimiento: aplicación de las tecnologías de la información y las comunicaciones para la transferencia de conocimiento explícito y el uso de técnicas de gestión del conocimiento persona a persona para facilitar la transferencia de conocimiento tácito. El estudio señaló los desafíos para convertir conocimiento tácito en explícito, así como la importancia de las iniciativas de gestión del conocimiento que combinan el entusiasmo de las iniciativas de abajo hacia arriba conjuntamente con un fuerte apoyo arriba hacia debajo de la alta dirección.

- Rapid advances in information and communication technologies (ICT) have made it possible for the companies to gather and process unprecedented quantities of data while providing the means for globally dispersed employees to communicate and collaborate closely.
- Individual projects (developing a new oilfield, constructing a deep-sea drilling rig, building a LNG plant) typically involve multi-billion dollar investments. Such huge investments require exceptionally careful analysis of the risks involved necessitating a marshalling of the full range of available information and know-how relevant to the project.

- The companies have undergone a major change in their *dominant logic*. Twenty years ago management in the oil and gas sector was viewed in engineering terms: tangible inputs—finance, equipment, and people—were deployed to acquire physical assets—oil and gas reserves—which were then transformed into marketable end products through a vertically-integrated system. Since the early 1990s, the oil and gas companies have recognized that they are operating in a knowledge-based business where superior performance is achieved through the early identification and appraisal of opportunities and their speedy exploitation.

These factors were especially relevant to the international, shareholder-owned oil and gas companies. While the national oil companies could rely upon their ownership of low-cost reserves as the basis for their continued pre-eminence in oil and gas production, the majors had to rely upon their superior technology, management systems, innovation, and learning capabilities for their competitive advantage. By the early years of the 21st century, Schlumberger, BP, Royal Dutch Shell, and Chevron had become recognized leaders in the field of knowledge management.

Conditions specific to the oil and gas industry further suggest the potential of knowledge management to provide solutions to some of the most critical problems faced by the industry. Between 2000 and 2010, the Society for Petroleum Engineers (SPE) estimated that 231,000 years of cumulative experience and knowledge will be lost to the industry in the next 10 years due to retirement of petroleum engineers and other technical staff. Knowledge management offers a means of limited the

Since the early 1990s, interest in knowledge management has been spurred by accelerating rates of technological and market change that have resulted in innovation and learning becoming increasingly important for business success and by rapid advances in information and communications technology (ICT)

potentially devastating effects of the continuous knowledge loss of due to retirement & downsizing (Drain, 2001). For these reasons, we undertook a detailed study of the evolution of knowledge management practices among a sample of oil and gas companies (including not only petroleum producers but also oilfield service companies). Our goal was to use the learning from the experiences of these companies to provide guidance to companies' in their use of knowledge management (KM), primarily in the petroleum sector, but also for other companies. **Table 1** shows our sample of companies.

KEY WORDS

Knowledge management practices, person-to-person knowledge management, communications technology, case study

PALABRAS CLAVE

Prácticas de dirección del conocimiento, dirección del conocimiento persona a persona, tecnologías de la comunicación, estudio de casos

Table 1. The Companies

COMPANY	ADOPTION OF KM ¹	ORIGINS OF KM ²
BP	1996	Organizational learning/best practices transfer in upstream
Royal Dutch Shell	1995	Organizational learning initiatives by corporate planning (e.g. scenario analysis, cognitive maps)
Chevron	1996 (in Chevron)	Best practices transfers & cost reduction in Chevron's downstream businesses
ExxonMobil	2003(?) ³	In Exxon: application of IT to E&P. In Mobil, best practice transfer in downstream
ConocoPhillips	1998	IT support for E&P
Schlumberger	1997	IT applications to drilling
Halliburton	1998	IT applications to drilling and seismic analysis
Marathon Oil	1999	IT applications to exploration
Murphy Oil	2000(?)	IT applications to exploration
BHP-Billiton	2000	KM uninitiated by IT dept. - but not adopted company-wide
Paragon Engineering Services Inc.	1999 (approx.)	KM practices based upon groupware, intranet, project files, & other IT tools

Notes:

¹ Establishment of KM as an explicit program at corporate level.
² Corporate or business activities most closely associated with subsequent KM program.
³ ExxonMobil has not formally committed itself to KM at the corporate level, however, by early 2003, the term KM was used widely both on upstream and downstream businesses.
N.I.R. = Not Included in Report

A key observation from our study was the role of KM as a major force changing thinking and management practices among the oil and gas companies. Not only did all the companies we surveyed institute KM systems and processes, at most of these companies senior managers offered explicit recognition of the importance of all of these companies testified to the importance of knowledge management within corporate management systems as a whole and as a major contributor to performance enhancements. For example, Chevron's former CEO, Ken Derr observed: "We learned that we could use knowledge to drive learning and improvement in our company. We emphasize shopping for knowledge outside our organization rather than trying to invent everything ourselves. Every day that a better idea goes unused is a lost opportunity. We have to share more, and we have to share faster". BP's former chairman and CEO, John Browne, similarly identified the central role of KM: "All companies face a common challenge: using knowledge more effectively than their competitors do". Several national oil companies also adopted KM. At PDVSA, Rudulfo Prieto, commented: "We got into KM because we had so many projects going on that it was difficult to standardize without limiting creativity. ... Through KM, different leaders not only share experience and knowledge, but go forward to create what I call 'contamination centers' where people infect each other with ideas". At the oilfield services leader Schlumberger, D.E. Baird was emphatic that: "We must become experts in capturing knowledge, integrating and preserving it, and then making what has been learned quickly and easily available to anyone who will be involved in the next business decision".

2. MOTIVATION FOR KNOWLEDGE MANAGEMENT

While a common set of industry forces encouraged the oil and gas companies to adopt KM during the late 1990s, each company's circumstances was different. As we shall see, these different circumstances had an important influence on the KM strategy adopted by each company.

Table 2. **Motives for the adoption of knowledge management**

COMPANY	MOTIVES FOR ADOPTING KM
BP Amoco	Following radical organizational decentralization, KM viewed as mechanism for achieving lateral coordination
Royal Dutch/Shell	In Shell's highly-decentralized multinational structure, KM was a natural complement to strategic planning and career management as an integrating mechanism. With poor profitability during early 1990s, Shell came under strong pressure to make more effective use of its dispersed talent
ChevronTexaco	Chevron's adoption of KM driven by pressured for cost reduction during early 1990s. Resulted in strong interest in transfer of best practices
ExxonMobil	Mobil enthusiastic adoption of KM during the mid-1990s was driven primarily by its desire to improve efficiency in E&P and in refining through improved identification and transfer of best practices
ConocoPhillips	Expansion of exploration, especially in deepwater Gulf of Mexico, created need for data management systems to support huge amounts of data being generated and processed and link them to decision processes
Schlumberger	Impetus for KM came from need to link rapidly advancing data management with systems that linked human expertise in globally distributed operations
Halliburton	
Marathon Oil	Desire to improve upstream performance through more effective linking of people to people and people to information

3. WHAT KNOWLEDGE IS MANAGEMENT?

3.1. Tacit and Explicit Knowledge

There are several ways of categorizing the knowledge that can be managed by a firm. The literature on knowledge management (Nonaka 1994; Kogut and Zander 1992; Grant 1996) distinguishes types of knowledge based upon the extent to which it can be transferred. A fundamental distinction is between *tacit* and *explicit* knowledge:

- *Tacit knowledge* is the stock of expertise and knowledge within an organization—primarily located within the brains of employees—that can not be easily expressed or identified, but may nevertheless be essential to its effective operation.

- *Explicit knowledge* is the more visible knowledge found in manuals, documentation, files and other accessible sources.

As Nonaka (1994) makes clear, although explicit knowledge may be easier to access and transfer (especially through information technology systems), managing both types of knowledge is important to achieving the objectives of knowledge management. Organizations need to be able to transfer the tacit knowledge found in its employees' diverse experiences in order to succeed and this is most often achieved through richer forms of knowledge transfer like interaction between groups and individuals.

Most of the organizations, we surveyed did not appear to differentiate specifically between types of knowledge to be managed—most organizations emphasized the broad challenges of knowledge management and did not link particular types of knowledge to particular KM instruments. Nevertheless, the different KM tools deployed by the companies did, implicitly, distinguish different types of knowledge. For example, explicit knowledge was managed primarily through people-to-information mechanisms which relied primarily on IT. Tacit knowledge was managed primarily through people-to-people mechanisms such as communities of practice. Some of the most interesting and fruitful areas of KM occur at the interface of tacit and explicit knowledge. For example:

- In order to utilize tacit knowledge more fully, companies have sought to convert tacit knowledge into explicit knowledge. Most companies have instituted project reviews where “lessons learned” are distilled and entered into a database.
- Most companies have used IT in order to increase the efficiency of person-to-person transfers of tacit knowledge. For example, most of the companies we studied have instituted some form of “expert locator” or “corporate yellow pages” that enables individuals with particular experiential knowledge to be identified and contacted.
- Most of the knowledge being managed by the companies comprises both tacit and explicit knowledge. For example, one of the most important areas of KM among the oil and gas companies is *best practices transfer*. Best practices tend to be recognized through explicit performance data, but their analysis and transfer requires substantial levels of tacit knowledge both at the level of individual expertise and in organizational routines.



3.2. KM in Different Businesses

Among most of the companies, the primary impetus for KM has come from upstream. This reflected several factors:

- For most of the companies, upstream was viewed as more important than downstream because it was the primary source of profitability of the companies.
- Upstream has been the most technologically dynamic area of business with rapid advances in drilling, seismic analysis, rig design, reservoir modeling, recovery techniques, and many other areas of technology. Most of these technologies have been accompanied by rapidly increasing in information and communications technology including telemetry, data warehousing, and real-time decision support.
- The increasing costs and technical challenges of deep-water exploration have called for faster, more informed decision making. The cost of errors and the cost of delays have increased substantially.

The result has been a surge in the development of highly sophisticated IT tools for managing and interpreting the massive amounts of data being generated during exploration. The oilfield service companies—Schlumberger and Halliburton—have been leaders in developing ICT solutions for the management of information to improve the efficiency and effectiveness of decision making in exploration activities.

At the same time it has become increasingly apparent that ICT cannot provide a total solution to KM in upstream activities. For all the advances in intelligent solutions, advanced modeling, satellite-based data communications, and raw computing power—decision making in E&P remains highly dependent upon intuition and experiential knowledge that cannot be reduced to data analysis. Given the global dispersion of upstream personnel, exploration has also provided leadership in the development of person-to-person modes of KM.

While the upstream sector has provided the cutting edge for the development of most KM systems and techniques, some of the biggest problem areas for the oil and gas majors have been their downstream businesses. Throughout the past 10 years, the majors have struggled to improve the profitability of their refining, marketing and chemicals businesses. As a result there has been considerable interest in analyzing performance differences between different operating units, identifying best practices, and transferring

best practices to other units. In Mobil and Chevron, programs for disseminating best practice have provided a major impetus for KM.

4. SYSTEMS AND TOOLS FOR MANAGING KNOWLEDGE: (I) TECHNOLOGY-BASED

Not surprisingly information technology (IT) played an important role in knowledge management systems in the oil and gas industry. Some companies, such as Schlumberger, have relied heavily on information technology and the codification of information to reach their knowledge management objectives. Others, such as Shell, and BP, emphasize a less formal and more-people oriented approach to knowledge management. Regardless of which approach firms have taken, IT was an important facilitator for many of the technology and people-based activities important to knowledge management success.

Databases: Information technology has facilitated the assembly of databases that can serve as corporate memories for important information including best practices, technical and managerial performance data, company yellow pages, and supplier and customer information. For instance, Schlumberger relies heavily on the use of IT to create and use directories useful to the management of knowledge. Intranets serve as a common medium of access to information and a variety of tools and repositories, such as the Schlumberger Knowledge Hub (the company-wide directory and expertise finder), data dictionaries, supplier contracts, digital libraries, catalogs, general news, manuals and online training modules, and bibliographic databases. Companies have developed databases of best practices like Chevron Texaco's Lessons Learned Database and BP's database of After-Action-Reviews meant to capture positive and negative experiences. Other databases facilitate the meeting of experts including Yellow Pages of Engagements and BP Amoco's Connect – a voluntary intranet Yellow Pages directory that makes it easier to find expert help containing details of more than 12,000 employees. ExxonMobil is working towards a single database for safety which will hold the records for all incidents and near misses worldwide. They are also developing another database that collects and aggregates environmental performance indicators for corporate wide reports. Often firms provide support personnel or reference librarians who act as knowledge brokers and assist users in searching these databases. (E.g. Halliburton).

Software Tools: An important aspect of databases is the ability to link them and make them widely accessible. Software tools associated with databases help users navigate, find and apply useful information relatively quickly and at a low cost. ConocoPhillips uses several databases linked by Oracle's web-based ConText search engine to develop an integrated document management system. It consolidates Conoco's operational and legacy databases in a data warehouse. Schlumberger has InTouch—a real time tool that helps capturing, managing, and sharing operations-related knowledge with the intent of faster and more reliable services for customers, accelerated product development, and significant financial benefits. Using the Web-based system, field staff can access validated data, information, and knowledge 24 hours a day, 7 days a week. More than 17,000 users benefit from real-time knowledge interchange with technical experts at 20 technology centers worldwide. In addition to rapid problem-solving, this level of technical collaboration provides technology centers with a better understanding of customer needs, leading to more rapid development and deployment of products and services.

Portals: Another important aspect of IT-enabled KM is the ability to provide users a personalized, single point of access for the applications and content they need. For this purpose, Internet portals are especially useful. A portal is a single gateway through which employees, customers, or partners can retrieve and share knowledge. Portals can help reduce the inconvenience and inefficiency caused by using multiple applications by integrating a wide range of application programs so that information can be exchanged and shared irrespective of a type of application. ChevronTexaco's Plumtree portal is a good example. It serves as the doorway to the network. The first three pages of the portal display links, calendars, a place where users can upload and share documents, and tips for finding specific information. Further into it, each separate network has its own page that is more specific. For example, on the Reservoir Surveillance network, users will find information about that area, key contacts and items of particular interest to that network.

Groupware: Collaboration software and groupware make it possible for groups and teams to interactively share knowledge. Groupware helps create a shared space where users can exchange knowledge and manage common tasks and resources. Various types of



groupware have helped the creation of virtual communities to enable the management of knowledge. During the early 1990s, Lotus Notes and similar groupware revolutionized communication and collaboration among many of the majors by providing email, mailing lists, ad document sharing. Subsequent developments in groupware provide more sophisticated support for virtual communities. For instance, TechLink is a Conoco tool that links all 6,000 engineers and scientists worldwide. It originated in drilling and productions, but was effective enough to be used in other areas, and is now used company-wide. ConocoPhillips has continued to develop this tool to hook up employees with each other.

Off-the shelf collaboration tools have been very useful in enhancing the use of virtual teams even in companies that do not emphasize it in their knowledge management approaches. Initiated in 1995 as a visionary experiment, the Virtual Teamwork program at BP brought together desktop video conferencing and collaboration technologies with behavior change coaching. Almost 1,000 BP staff and over 30 of its key partners and suppliers regularly used this capability to transfer knowledge face-to-face.

Table 3 shows the principal phases of KM and the IT tools relevant to each.

Table 3. Information technologies for knowledge management

PHASE OF KM	INFORMATION TECHNOLOGIES AND TOOLS	
Capture and Store	Electronic Document Management System (EDMS) Database Management System (DBMS)	Internet and Intranet
Search and Retrieve	Information Retrieval	
Send critical information to individuals or groups	Push/agent, e-mail	
Structure and Navigate	Classification, World Wide Web/HTML	
Share and Collaborate	Workflow, Groupware, e-learning, Virtual Communities	
Synthesize	Data mining, Business Intelligence	
Profile and Personalize	Agents, Portal	
Solve or Recommend	Case-based reasoning, Rule-based systems	

5. SYSTEMS AND TOOLS FOR MANAGING KNOWLEDGE: (2) PEOPLE-BASED

While the initial impetus for KM was advances in IT, during the past five years the major driver behind KM has been the desire to leverage employee-based tacit knowledge. For Shell and BP, facilitating knowledge exchange between people has provided the central thrust of their KM programs. Scott Beaty, knowledge-management officer in group learning and performance operations at Shell Oil Co says, “When you start talking about knowledge, it’s really about people”. The challenge for the companies has been to go beyond occasional bilateral knowledge exchanges, to form interactive groups that share knowledge in a rich, continuous and dynamic manner. Since 1998, all the oil and gas majors have established informal or semi-formal groupings of employees that share common technical or professional interests for the explicit purpose of sharing knowledge. These knowledge-sharing groups go under a range of different names. For example, community types within ExxonMobil include: Communities of Practice, Best Practice Communities, and Communities of Interest (ExxonMobil, 2003).

Communities of Practice: Of all the tools of KM used in the oil and gas sector, the most widely and enthusiastically adopted have been communities of practice (Wenger et al 2002). These have been described in different ways in the industry:

- Shell defined communities of practice as “Groups of people geographically separated who share information, insight and advice about a common interest or practice”.
- At Chevron Texaco communities of practice, also referred to as networks, were defined as: “Informal networks of people with common job functions who meet to share knowledge, leverage experiences, and improve individual and collective capacity to contribute to the success of the business”.
- Schlumberger defined them as “A group of people who share a common area of expertise and need similar solutions to common problems”.
- The APQC described communities of practice as: “Groups of people who come together to share and learn from one another face-to-face and virtually. They are held together by a common interest in a body of knowledge and are driven by the desire to share problems, experiences, insights, templates, tools, and best practices”.

Despite some differences in definition and nomenclature, the approach of the different companies to setting up and operating communities of practice were very similar. The starting point for most companies was Exploration and Production where all the companies established communication and consultation networks among engineers and technical personnel for the purpose of sharing know-how and expertise. However, the success of communities of practice has resulted in their tendency to extend throughout company-wide reaching both downstream businesses and corporate support functions—health and safety, energy efficiency, process engineering, web application development, retailing to mention a few. Communities of practice are seen as the most effective mechanism to facilitate knowledge transfer. They are an integral part of a learning environment, and a catalyst for the deployment of innovative ideas. Through their participation in communities, members seek others who are doing similar things or face similar problems, and who can quickly answer their questions, recommend products and procedures, or become mentors. Community involvement not only allows participants to make a contribution, but it allows them to strengthen and fine-tune their own skills, creating even greater potential value for the organization.

The main differences between the companies in their use of communities of practice relates to the degree of formalization, the processes through which they are formed, and the extent of company support given to them.

- Halliburton's approach to knowledge management was centred upon its communities of practice. Halliburton had a KM director and four assistants responsible for guiding development of new communities and staying involved with them after deployment through quarterly meetings. Each Community of Practice featured at least one full time Knowledge Broker who was responsible for monitoring and moderating a community portal, facilitating the personal networking by making sure the right people talk to each other. They watch every thread, make sure a Subject Matter Expert is found for every question, and double-check solutions posted by community members. They database and archive all threads, and remove a thread 30 days after a solution is found. The Knowledge Brokers also keep in touch with each other. There are roughly 350 Community of Practice members to each Knowledge Broker. The Knowledge Broker

usually reports to a global operations manager. In addition Halliburton has Knowledge Champions, who are individuals appointed by VPs. In addition to their regular full-time (non-KM) responsibilities, they act as touch points for the Knowledge Brokers functioning as the liaison / support for the community.

- At ChevronTexaco, over 100 communities of practice existed in 2004 linking professionals across refining, retail, drilling, energy management and information technology businesses, among others. Each network had a charter, an implementation plan, designated leaders and core members. CoPs crossed business units and tended to be global in scope. There were four major network groups: Reservoir Management, Drilling & Completion, Facilities and Operation; each comprised a number of smaller networks with more specific expertise. For instance, there were eight separate networks in the Facilities & Operation group.
- At Shell, communities of practice began as spontaneous associations, but tended to become increasingly formalized over time. The starting point was typically around 15 founder members, one of whom agreed to act as a coordinator, together with a facilitator who was experienced in initiating new networks. In E&P, this process had produced 107 communities by 2000. In order to achieve greater coherence and effectiveness, mergers between communities were encouraged. The end result was just three Global Networks: Surface, Sub-surface, and Wells. By 2003, Shell had 14 Global Networks covering the following areas: Benchmarking, Competitive intelligence, Commercial, eBusiness, Human resources, Health, safety, and environment, IT, Knowledge sharing, Opportunity evaluation consistency, Procurement, Subsurface, Surface, Special Interest Areas, Wells. In addition to its Global Networks, Shell also had a number of Local Networks. In E&P, these include: 4D Networks, Completions Network, Drilling Network, Geophysics Network, Petrophysics Network, Reservoir Engineering Network, and several others.

The formalization of these networks was indicated by the creation of governance systems—each network developed a “charter” and appointed a Network Steering Team.

- Schlumberger’s 17 communities of practice covered the main technical areas of E&P. Although participation in the communities was voluntary, Schlumberger’s communities had become



central to its operating strategy and were heavily supported with corporate IT resources. The communities of practice were integrated into Schlumberger's systems for the technical assistance, project documentation, and best practice transfer.

- SK Corporation of South Korea made communities of practices a core comp net of its attempt to build a knowledge sharing culture. Starting from simple groupware in 1995, SK introduced some 500 CoPs which in turn fed a knowledge database and "knowledge marketplace" where employees could buy and sell their knowledge using virtual points. This practice makes it possible to identify who needs what type of knowledge as well as the owners of current knowledge. SK Corp may be characterized as following a "personalization strategy", which focuses on people-to-people communication, as opposed to the "codification strategy", which relies on IT to automate knowledge sharing processes (Hansen et al, 1999).

Best Practices Groups: Several of the firms interviewed had groups or teams working on the recording and sharing of best practices:

- ChevronTexaco has application teams that travel to different sites identifying, collecting, and disseminating information on best practices. These teams work with local teams to implement Best Practices, taking into account the contextual differences of each situation.
- Shell Oil has established knowledge communities of employees with common interests. For example, a group of engineers from 11 refineries across the U.S. shares information on best practices via the company intranet and periodic face-to-face meetings. Participants found it difficult to adopt practices and suggestions from co-workers with whom they didn't have a personal connection. But working within a small, targeted group helped them create a pool of knowledge that they don't hesitate to dip into and use. Beginning with US refineries, Shell launched its "PEARL" (Practice Excellence through Accelerated Replication) methodology during 1998. The approach was adopted from Ford Motor Company, which introduced the system in the mid-1990s. It involves using communities of practice to identify successful practices (i.e. an activity that is successful at a particular location), to examine its relevance to other locations, and to document it and communicate it to other community members.

- At Schlumberger, the identification and validation of best practices is one of the central roles of the communities of practice. Each community member is encouraged to identify good practices that they then submit to the community as best practice proposals. Once the community validates the practice, it is stored in the Knowledge Hub. The “Knowledge Champion” within each community has the role of encouraging the submission of best practice proposals, validating the proposals, and integrating the new practice into the community’s knowledge repository.

Virtual Teams: The opportunities for communication and collaboration made available by IT and the new thinking about horizontal coordination ushered in by KM led to significant stages in operating practices among several of the companies. At BP, in particular, KM was concerned less with establishing a parallel structure for managing knowledge sharing as with making existing working teams operate more effectively. BP’s virtual teams began in drilling where it was noted that isolated drilling teams making critical decisions with very little time for analysis or consultation would benefit substantially from closer contact with colleagues in other locations. Through groupware and video links, BP established real time communication between BP’s drilling teams in different locations, with suppliers and contractors, and with business unit managers. By 2000, virtual teamworking had spread throughout the corporation.

Peer Review Groups: One of the most powerful KM tools for project-based organizations has been the “lessons learned” methodology pioneered by the US Army (Slabodkin, 2006). ConocoPhillips introduced group sessions in which staff from recently completed projects meet and record lessons learned from their experiences with the project. The sessions are facilitated by an individual and the discussion is captured in project reports then made available to other groups. Similar groups were formed around activities such as due diligence, risk management, and specific functional areas.

KM and HRM (1) Training: Most of the oil and gas companies linked training and career management to their KM systems. In IT-intensive companies such as Schlumberger, the web-based systems supporting knowledge capture and knowledge transfer were also used to support on-line training that was designed for focus, flexibility, and accessibility. Web-based training was organized around series of tutorials. Such training was especially important for new hires as a means of getting new organizational members familiar with Schlumberger’s

systems and procedures and formed a major mandatory component of their overall training program. Along with several other companies in our sample, Schlumberger had found training for experienced engineers to be a greater challenge. In particular, BP's Virtual Teamwork initiative required substantial investments of training and coaching for older and more senior personnel. Exxon Mobil's much-admired training curriculum was oriented not only towards technology training but also towards developing a culture of sharing knowledge through seminars, employee rotation and other activities.

Knowledge management objectives are inevitably intertwined with regular functions of the human resource divisions of the petroleum firms. At ConocoPhillips, knowledge management considerations played a role in the selection of young talent. Further, career tracking by human resource departments accomplished two knowledge management objectives. It helped maintain a record of the tasks, roles, and experience on specific projects, so that when issues or problems arise in the future, individuals with relevant and pertinent experience can be consulted. Career tracking also helped to increase job satisfaction and professional development opportunities, which reduces turnover and keeps intellectual capital within the company.

KM and HRM (2) Knowledge Retention: A major problem for all the companies in our sample was knowledge loss resulting from employees retiring or leaving the company to join other companies. In Exxon Mobil the management was well aware of the impact of the aging of the oil & gas employee population and the turnover and institutional knowledge loss associated with retirement. Managing the risks of "brain drain" was a key element in career development. Though it starts with recruiting and training the right people, employee careers must be managed so that individuals choose to stay with the company and the benefit of their knowledge is not lost to a competitor. There are well-defined career requirements and competency milestones to guide employees along their career paths. Efforts are made to develop a career path that takes full advantage of an individual's capabilities, which improves job satisfaction. Younger employees and those entering senior management positions are mentored by more seasoned individuals, who pass on their expertise and therefore preserve their tacit knowledge. There is a formal succession plan to ensure that all skill positions are covered. Thus companies are attempting to take specific actions to deal with the 'people' dimension of knowledge management.



The problem of knowledge loss through human resource attrition was a source of concern not just for individual companies but also for the industry as a whole. As a result a number of inter-organizational and industry-wide knowledge-sharing networks have been established. These included the Global Benchmarking Group, an independent group is made up of representatives from the largest oil companies which establishes common set of definitions and standards as regards technology and processes in the oil and gas industry and collects information and performs studies on different practice areas, primarily in upstream activities. Also, industry and trade associations permitted networking and the exchange of information between other companies and agencies. Examples are the APQC KM conferences, and The Energy Knowledge Management Network, a group of 10-12 operating companies that meets periodically for a day of presentations.

6. IMPLEMENTING KNOWLEDGE MANAGEMENT

The case for knowledge management is inarguable. Competitive advantage is critically dependent upon a company's ability to increase the effectiveness with which it acquires shares and exploits information and know-how. The real challenges are organizational. How should KM initiatives be implemented? All of the companies we studied experienced difficulties and failures in their implementation of KM. Gaining information and insight into these difficulties and failures was problematic. Most of our interviewees were leaders of KM in their respective companies—many of them were evangelists for KM. As a result, it was difficult for us to gain a balanced view of the success of KM—most of our interviewees, we felt, downplayed the problems that they encountered in putting KM initiatives into practice. Nevertheless, by comparing the experiences of the different companies we were able to gain some insights into the problems that were encountered and the different approaches that were taken in overcoming these problems.

6.1. Top-down versus Bottom-up Initiatives

Since KM involves fundamental changes in how employees behave and interact with one another, one of the critical issues we addressed was: Where do KM initiatives originate, and whether the source of the initiative influences the success of KM? In our entire sample, KM initiatives originated among activists who were outside the top management team. For example:

- At BP, KM began with IT personnel within BP's exploration division.
- At Shell, KM was closely associated with training activities at Shell Oil, Shell's US subsidiary.
- At Chevron, KM had its origins in quality management and best practice activities in both upstream and downstream businesses.
- At Schlumberger, it was IT professionals and developments in data management that provided the impetus for KM.
- At Halliburton, KM had its origins among KM enthusiasts within the IT department.

However, for KM initiatives to take root and flourish within the companies, top management leadership was an essential ingredient. For example, at BP, John Browne, then head of exploration, was a key convert who championed KM in BP's upstream activities. Once Browne became CEO, then KM became one of the central themes of his corporate leadership. Similarly, at Chevron, it was Kenneth Derr's championing of KM that resulted in the widespread adoption of Chevron's system of best practices transfer.

For most of the companies, KM evolved rapidly from decentralized to centralized initiatives. KM activists lower in the organizations created initial interest and developed prototype programs, but building effective IT support and building an organization-wide impetus typically required corporate-level leadership. For KM to become effective typically involved two key developments: first, building a company-wide technological infrastructure for KM; second, achieving buy-in at the business level. For both of these tasks it was essential for the initiative to come from top management. There is some evidence that the continued evolution of KM may require a cycle of centralization and decentralization. While "grassroots" initiatives provide the initial flourishing of KM, and centralized leadership is required for establishing company-wide KM programs, embedding KM practices within the daily operational activities of a company may require a further phase of decentralization. Chris Mottershead of BP observed that, after centralizing BP's KM activities through establishing a corporate KM team, BP recognized the limits of what should a team could achieve:

"With a staff of 25,000 technical people, most of the value comes from the knowledge they apply daily. Believing that 12 or even 26 experts were going to reach the entire technical staff was

unrealistic, so we dispersed this team back into the business units in 1999. That strategy was successful because added up to that point were transfused back into the organization. A group with two or three members from the original knowledge management team was maintained to support knowledge exchange between different geographical regions and between the different business areas". (O'Brien & Rouse, 2001).

Companies did not employ a uniform organizational approach in setting up and controlling KM activities. Most companies have relatively few dedicated staff for developing knowledge management systems and supervising its implementation. Also in spite of the large cost savings associated with knowledge management, relatively few of the firms surveyed had distinct budgets for the KM. Rather than create separate offices or departments to handle KM initiatives, many companies have attempted to align and integrate their knowledge management initiatives, with the existing structures. In most companies KM activities were assigned primarily to the IT department—although in several, KM was located within cross-functional teams:

- In BP Amoco there is a team of 10 knowledge management officers linked closely to the senior management of the company that oversees knowledge initiatives. Yet, the emphasis in BP Amoco is on making knowledge management a decentralized process and allowing employees to feel a sense of ownership.
- In ConocoPhillips there is a "Leader of Knowledge Leveraging" but he has no department or staff as direct reports. He also does not have a budget but works with departments to get initiatives implemented using their own budgets.
- Halliburton has a core Knowledge Management group consisting of a KM Director and four staff members. The KM Director is a cross between a business analyst and a consultant. Outside consultants are also used, such as software developers, change management or quality experts.
- In Schlumberger KM is primarily a corporate-level initiative led by the Technology Group. In 1998 the company established a 6-person KM team headed by a Vice President for Knowledge Management.
- At Shell, KM programs and KM specialists are employed in each of the four major business sectors (E&P, oil products, chemicals, and gas and power). In addition, Shell's shared services organization provides technical support.

Rather than assign the responsibility of KM to a particular group, other energy companies have attempted to broaden the responsibility for implementing KM systems by integrating it with the broader organization. In Exxon Mobil, as one official puts it, “We do not have an official KM program with dedicated KM staff, because the concept of knowledge management has always been part of our value system – it’s just the way we do business”. Thus there is no official KM officer or department at ExxonMobil, and therefore no separate budget allocated to the practice. Knowledge management and transfer are integrated into many different management systems and processes, and so consist of several decentralized initiatives. Budgets to support these initiatives are allocated on a case-by-case basis by different departments. In Chevron Texaco, as well, the emphasis is on integrating and managing knowledge throughout the company. In this company knowledge management does not seem to be a distinct initiative, but rather an inherent part of the overall corporate strategy and leadership vision. Chevron Texaco has a corporate strategy called “4+1” where “4” stands for cost reduction, operational excellence, managing capital funds effectively, and profitable growth, and “1” stands for organizational capability. Knowledge management is seen as being inherently a part of this firm-wide effort to build “a world-class system combining people, processes and culture to achieve and sustain industry-leading performance in the four key areas”. (Chevron Texaco Corporation 2002). Thus Chevron’s knowledge management organization is not apparent – rather various managers have knowledge management as part of their responsibilities. There is, however, a knowledge management strategist that acts as a consultant to knowledge management projects throughout the company. In addition, each business unit has an employee that either has a knowledge management title or is at least responsible for knowledge management. Business units are responsible for funding and managing their own knowledge management projects. Hence, the budget for knowledge management projects varies and depends on the unit. The Upstream Exploration and Production unit, for instance, has sophisticated networks and spends billions of dollars. In contrast, the Energy Technology Company has a budget of only \$2.5 million for its technology deployment project. Shell Oil too has a decentralized approach to managing knowledge but tries to balance this with coordination. It allows business units construct their own Knowledge Management systems, but the 27 managers of

those programs in the US meet every six weeks to discuss shared interests and best practices.

6.2. Formalization of KM

There is a sharp contrast between the formalization of most IT-based approaches to KM and the informal approaches that are characterize the person-to-person KM techniques—communities of practice in particular. Many of the proponents of KM have emphasized the non-hierarchic and emergent characteristics of KM. This was supported by much of the early research on communities of practice that emphasized their spontaneity and absence of leadership or formal authority. For some companies, a reliance on local initiative and lack of formalization worked relatively well in the early stages of KM. For example, at BP Exploration, initial experiments in virtual teaming resulting in a clamoring to form teams on an ad hoc basis. Similarly with Shell's communities of practices were initially highly informal.

The trend over time has been for person-to-person knowledge sharing mechanisms to become increasingly formalized. In particular, communities of practices in several companies have moved from being loosely-linked, self-governing associations of like-minded professionals, to having clearly defined individual roles, reporting requirements, and governance structures.

For example, each of Shell's Global Networks includes:

- A Global Coordinator.
- Hub Coordinators for each of Shell's operating units.
- Individuals appointed as "Focal Points" for each Subject Area.

At Chevron, knowledge leader, Jeff Stemke emphasized the importance of formality in KM activities:

"The most successful communities have defined business goals, clear sponsorship form senior management, and a dedicated coordinator... At the other extreme are informal communities where there's no leader, just a group of people who get together. They may have teleconferences or meetings occasionally, but there's no formal process for sharing knowledge. These groups are only valuable if you happen to be in the community... We now recognize that networks need a coordinator. This position is funded or we recommend highly that it be funded to the extent of 10 or 20% of a person's job. We have not been totally successful in making the communities vital. There definitely needs to be some executive sponsorship and specific deliverables or



metrics that the community strives to achieve and that people can measure. In this way, communities know they're on track and others can see what they have achieved..." (O'Brien & Rounce, 2001).

6.3. Culture and incentives

Among the major challenges of knowledge management is getting buy-in from the employees. No knowledge management system can work unless the participants fully understand the benefits and unless employees have formal and informal incentives to participate. Even in organizations that have a technology intensive approach to knowledge management, the extent to which the technology is put to use and depends on the accompanying culture and incentives.

Only in a few of the organizations surveyed were employees directly incentivized to participate and perform in knowledge management systems. In most cases the incentives were either informal or indirect through the establishment of a culture supportive of knowledge management and through leadership support. In some business groups in Chevron Texaco, job responsibilities include participation in the networks or communities of practice. In the technology groups in this company, knowledge management participation is explicitly considered as a performance indicator when assessing promotions. However, there are no financial incentives for using knowledge management at Chevron Texaco, other than basic long term ones and growth in an employee's career. Direct and formal systems are more common, though, in project oriented companies like McKinsey and Accenture where employees can charge 'billable hours' for some activities associated with knowledge management.

In the oil and gas companies surveyed, most of the incentives to encourage participation in KM were informal or indirect. Knowledge sharing is often encouraged through peer and management recognition. For instance an informal incentive for employees to use BP's Connect is the "Fifteen Minutes of Fame" they get for adding content to their pages. The front screen of the Connect page shows a picture of the employee who last updated his details, so everyone in the company who accesses Connect will see this person's picture. This is meant to be a fun and creative way to generate participation in the program. In Chevron Texaco, participation in the networks can result in commendations that are sent to network leaders and senior management. Not only are employees who provide content

recognized but so are those that use knowledge management systems. In Conoco Phillips an effort is being made to stimulate sharing and knowledge reuse, by recognizing top users.

Early on in the process of implementing knowledge management systems, Schlumberger realized that a significant cultural change was necessary in order to weave knowledge sharing and reuse into the everyday workflow of field users. Specifically, the company needed to get field users to fill their knowledge gaps before starting a project, to continue the process during the project when conditions changed, and finally to share what they learned following the project. Once this became a natural part of the workflow for all employees, knowledge sharing and reuse would be truly institutionalized within the organization. As a management by objectives (MBO)–focused company, individual yearly objectives including knowledge sharing and reuse are a high priority for all field users. The standard appraisal form was modified to include a competency regarding knowledge sharing and reuse. The standard metric now included a knowledge activity report for each user, which, printed at the end of each quarter, demonstrates the state of fulfillment for that competency. Along with several training and communication measures, Schlumberger was able to create a culture supportive of knowledge management in the company.

Most of the organizations surveyed have attempted to develop a culture that is supportive of knowledge management. Of course, a positive culture is created by implementing a series of organizational systems and processes that enhance the perceived value and importance of knowledge management in the eyes of the employees. Recognizing this, one of the primary tasks of BP's knowledge management team is to visit each business unit around the world to create awareness and develop expectations across the company. An engagement typically consists of presentations and discussions with key staff, focusing on the importance of knowledge as a strategic asset and highlighting where knowledge management is already being successfully applied in the organization. Not only does this create an understanding of the KM process, challenges and opportunities but it also helps a culture that conducive to the management of knowledge and signals the leadership's interest in it. The BP Connect system fosters a sense of employee ownership by giving them the power to design their own web page and add their own content and creativity. The BP knowledge culture is intended

to be one of empowerment rather than mandate. Hence awareness campaigns use posters, competitions, learning fairs, and round-table lunches are utilized to generate curiosity and interest in the knowledge management programs.

6.4. Integrating KM into everyday work practices

KM only generates significant performance benefits when it has become embedded in the work practices of organizational members. If KM remains the preserve of IT professionals and a vanguard of lead adopters, then its impact will remain limited. The key is the way in which different tools and different programs integrate to support and transform the workflow within the businesses. For example, Schlumberger's Knowledge Hub draws simultaneously upon numerous technological tools and organizational systems and has changed the way in which project teams support units undertake their day-to-day work.

Schlumberger has attempted to integrate knowledge management activities into the work processes of all employees. The central group involved in knowledge management is the community of practice – a group of people who share a common area of expertise and need similar solutions to common problems. Each day, community members are engaged in doing their regular jobs (Field Activities). While performing their jobs, they conduct a dialog with their community colleagues around the world, asking questions, discussing problems, proposing new ideas, and validating solutions—capturing and sharing knowledge. This worldwide dialog is carried out via Email, enabled by the Schlumberger Intranet. The community members also have access to substantial work related information on the Web. The dialog among community members is carried out on several hundred Bulletin Boards, operating via email. When a message is sent to one of the special addresses assigned to bulletin boards, those who have previously indicated an interest in the topic in their directory record receive the message. In addition, the messages are posted in special Web areas, accessible through the company's Intranet portal.

Community members have access to documentation and manuals for the products they use in their field activities. Community members follow the same workflow--the steps necessary to perform a particular task--and have access to software necessary for their jobs (e.g., job planning and simulation tools). The members also have access to

measured data necessary for the decision making process (reservoir data, semiconductor test data, economic & business performance data) via a Data Management System. Project Archive, a storehouse of information on the past projects, facilitates reuse of information and knowledge. The Expertise Directory available on the Web allows the community members to find colleagues who may have the right skills, expertise and experience to help them solve their problems. A distinguished group of community members, “knowledge champions,” are recognized experts responsible for validating, integrating, packaging and publishing the knowledge captured by the members.

Thus, casual knowledge is transformed into Best Practices—recipes that detail the best way known by the community to accomplish a task or solve a problem. Knowledge champions are responsible for reporting community News—successes and failures, lessons learned, or alerts that can be accessed or pushed to the community members. They staff the community Help Desks, connecting others with the right knowledge and/or people. The help desk can be seen as a first step towards an Advisory Service for customers as well as community members. Finally, the knowledge champions are responsible for capturing the FAQs (Frequently Asked Questions) for the community. This combination of Intranet, software, and organizational systems and processes forms a successful Knowledge Hub that lies at the heart of Schlumberger’s knowledge management initiatives.

7. PERFORMANCE OUTCOMES

7.1. Quantifying the performance benefits of KM

Every organization we interviewed attested to the importance of KM and the belief that it will play a role in the company in the years to come. Some companies provided estimates of the performance benefits of their KM programs. BP estimated that, in 1998, knowledge sharing cut its costs by \$700 million. Shell’s Lesley Chipperfield estimated that KM initiatives had saved the company over \$100 million a year in upstream alone. However, it is unclear that any acceptable methodology exists for identifying and quantifying the effects of KM. The central problem is that it is difficult to envisage a company that does not employ some form of KM system. Other companies have pointed to the overall contribution of KM programs to overall performance improvement. Kenneth Derr, Chevron’s CEO

noted that: “Of the initiatives we’ve undertaken at Chevron during the 1990s, few have been as important or as rewarding as our efforts to build a learning organization by sharing knowledge. In fact, I believe this priority was one of the keys to reducing our operating costs by more than \$2 billion per year—from about \$9.4 billion to \$7.4 billion—over the last seven years” (Derr, 1999).

Estimating the overall performance impact of KM is more feasible in relation to specific KM initiatives and particular projects:

- Schlumberger reckoned that its InTouch knowledge management system that permitted faster and more reliable decision making had generated significant financial benefits. In 2001, the program’s cost savings and revenue generation totalled more than \$200 million; the time required to solve difficult operational problems had been cut by 95%; the time needed to update engineering modifications reduced by 75%. In addition, reductions in technical support costs saved \$30 million. Finally, InTouch helped to shorten the 3-year Schlumberger research and engineering cycle by bringing the technology centers into direct contact with field operatives and technicians.
- BP Amoco reckoned that it saved \$50 million in drilling costs at the Schiehallion oil field off the coast of Scotland by leveraging knowledge it had gained from developing prior oil fields (Ambrosio, 2000). Shell’s global communities-of-practice produced \$200m per year costs savings, increased facility uptime, and reduced design & planning errors (Leavitt, 2000).

On the cost front, calculations of the costs of KM also pose problems. The key issue is whether KM is defined to comprise all knowledge-based activities—IT, R&D, and training—or whether KM identifies with specific KM programs, in which case the costs of KM are incremental to basic information and technological functions. A survey by the Cranfield School of Management calculated that European companies, on average, spend 3.3% of their revenues on knowledge management (that is, on technologies and activities aimed at finding, collecting and sharing knowledge). By 2005, this is expected to rise to 5.5%—greater than the amount spent on R&D.

7.2. What works? What doesn’t work?

The task of assessing best practices in KM was complicated by the heterogeneity of experiences between companies—and often between the perceptions of different interviewees within the same company.



Our strongest and most consistent finding was that the most troublesome and least successful area of KM was in the application of IT to knowledge storage and knowledge dissemination. If the greatest opportunity in KM is to reuse the knowledge generated in one place in many places, then this was the greatest source of frustration by KM pioneers.

The primary approach to capturing and reusing knowledge was systems where every project would require the knowledge generated in the project and “lessons learned” from the projects to be added to a corporate database that then became available to other project teams. Making such systems work posed massive problems for most of the companies:

- When BP was developing its KM strategy during the mid-1990s, it surveyed other companies KM experiences and found that: “KM seemed to be grounded in lessons-learned databases which consisted on information that no one really wanted and very few people knew how to access”. (Chris Mottershead).
- Shell’s Andy Boyd commented that his experience of communities of practice at Shell suggested that, in terms of the value gained, 85% was derived from interpersonal discussion and only 15% from the knowledge base—however, 80% of the costs were in the knowledge base. “We have spent millions building databases of detailed technical documents, but few people search them”. (Boyd, 2003).
- Halliburton offered similar observations to those of Shell. Halliburton’s initial efforts focused heavily IT-intensive approaches to KM. The result was an overabundance of sophisticated IT tools all of which were underutilized. Halliburton drastically reduced the number of IT-based KM tools it utilized and reallocated its KM budget such 10-20% was allocated to information technology and 80-90% to people and processes.

The clear implication is that linking people to people is a more effective KM strategy than linking people to information. While the potential gains from the know-how generated during projects being stored in databases then being reused are potentially huge. The practical problems associated with such archiving are massive. The problems reported to us included:

- Users reported being overwhelmed with information when they tapped into corporate databases. When numerous documents or alternatives are presented, users have difficulty in knowing

which is best. In Exxon Mobil a common problem was that of information overload. Employees complain that there are so many sources of information that they don't know which one to choose. Fewer tools and databases may actually help the knowledge management process. Further, in Exxon Mobil many tools are not used to their full potential. For example, people need to spend time every week on Best Nets but this is difficult when one is time-constrained and faced with other pressures and priorities.

- The information being inputted into corporate databases often fails to capture the real insights that were generated during the project.
- Much of the information in corporate databases is out of date. There is a credibility problem for the user. Information in a database that is not linked to a respected individual will not necessarily be trusted. Shell's Lesley Chipperfield commented, "On a particular topic, you can search our intranet and maybe get 500 hits, but if someone recommends one, it has more value and credibility. The people you connect with may direct you to a report, but that report now has a personal reference. We have a slogan, 'Knowing who is as good as knowing how'".

To deal with these problems of sophisticated KM tools that are relatively unused within companies, two key changes appear to be taking place.

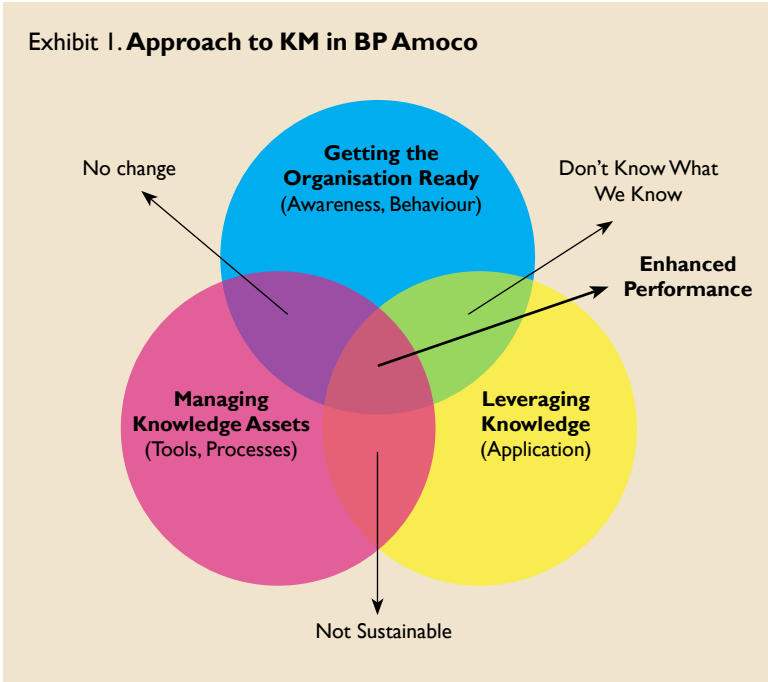
1. There is less emphasis being placed attempting to document all available knowledge and more emphasis on establishing "people locators"—directories where organizational members can identify colleagues with specific expertise. All the companies have established some kind of employee directory—typically personal web pages—where employees list their experience and skills. These corporate "yellow pages" were looked on favorably by most companies. However, their usefulness was not universally acclaimed. For example, Shell's Andy Boyd claimed that Shell's yellow pages had become increasingly problematic—they are "easy to build but hard to maintain", in particular it is very difficult to check the quality of the information and, as a result, have lost credibility. To avoid the quality problem, some companies have developed directories of acknowledged experts. Shell has an Experts Directory and Texaco instituted a Texaco Fellows Program prior to its merger with Chevron.

2. The major thrust with web-based information repositories has been speed and ease of use. Shell has placed a major emphasis on increasing the ease with which information can be accessed. Its *LiveLink* enabled web technology ensures offers a “simple attribute models combined with a consistent folder structure”. It has emphasized ease of use through its “Three clicks and I are there” slogan. In general, improvements in browser sophistication have done much to facilitate knowledge accessing.

Though every firm recognizes the importance of people in knowledge management initiatives, fully motivating and incentivizing employees to participate still remains a challenge. At Exxon Mobil, although the need for intrinsic and extrinsic rewards is recognized, currently there are no formal incentives for participating in or contributing to KM practices. Another lesson learned by firms like Exxon Mobil was that the benefits of knowledge management are not necessarily evident and salient to most employees. There is a need to make people understand and value the practices and to fully communicate their benefits. Several small firms felt the absence of adequate support for knowledge management initiatives. Another challenge is to get employees to use the technology available to manage knowledge. It is often considered too time-consuming and complicated to go to the electronic networks, so when someone needs knowledge, they just ask around and go to a person who worked on the same problem.

Instead of developing direct incentives for participation in KM initiatives, many firms like BP and Shell have relied on the development of a corporate culture to support KM. However developing an appropriate culture is not always easy. Schlumberger has found it difficult to build a knowledge sharing culture in the older and more senior employees. Employees recognize that knowledge is power and that they may change jobs, and are reluctant to share their expertise with new employees. An interesting lesson learned from Shell is that a cautious low-approach to initiating knowledge management systems is not best. “To get the greatest leverage in the organization, start with a high-value business problem”, suggests Scott Beaty, a knowledge manager at Shell Oil Co. in Houston.

The following figure (**Figure 1**) shows how the KM team at BP Amoco approaches the administration of knowledge management programs in the company.



8. CONCLUSION: MAKING KNOWLEDGE MANAGEMENT WORK

The speed and enthusiasm with which oil and gas companies have adopted the tools of KM during the 10-year period 1995-2004 points to the substantial potential for KM to boost efficiency, facilitate learning, build organizational capabilities and accelerate innovation in among global, technology-intensive firms facing constantly changing business and operating conditions. There is little doubt that KM has constituted substantially to the companies' success in dealing with the massive challenges of the past decade and a half—not only the technical challenges of frontier exploration and performance but also the organizational challenges of immense corporate size, environmental challenges of protecting the natural environment, and competitive challenges of limited access to many of the world's most attractive hydrocarbon deposits.

At the same time, the design and implementation of knowledge management tools and systems has been difficult. Most striking has been the difficulties experienced in the use of technological solutions. Despite the enthusiasm with which companies embraced IT-based knowledge management systems to increase the efficiency and the

effectiveness of employees in their work, implementing such systems has proven difficult. While the function of knowledge management systems is to deliver timely knowledge to appropriate individuals, the exponentially growing amount of knowledge in the knowledge repository thwarts such delivery through hindering knowledge retrieval and sharing. Moreover, as enterprises motivate system users with rewards or incentives, a large amount of knowledge will be stockpiled into such systems. A survey of 161 companies inquiring into the problems of using a knowledge management program found that the most frequently mentioned problems by respondents were:

Information overloads	65%
No time to share knowledge	62%
Not using technology to share knowledge effectively	57%
Difficulty capturing tacit knowledge	50%
Reinventing the wheel	45% (KPMG 2000)

Among all the companies in our survey we found that IT-based knowledge management systems facilitated knowledge storage and sharing, yet the ability of an organization to learn, develop, and share knowledge was largely dependent on how organizational members behaved. Accordingly, successful knowledge management requires linking the technology for knowledge management with an enterprise-knowledge sharing culture. Such sharing required managing the behavior of employees such that knowledge transfer becomes part of the organization's operating norm. This required: first, refining roles and responsibilities including the roles of knowledge owners, individual knowledge users, support members; second, incentives (including recognition programs) that motivate sharing, collaboration and innovation; and third, allowing those involved in knowledge sharing activities the time and space to capture knowledge and to collaborate with one another. Ultimately, the engagement of employees within a company's knowledge management processes requires the reformulation of perceptions and expectations about job responsibilities and performance such that knowledge-related activities are accepted as a normal part of the job.

In aligning knowledge management to a company's business strategy, our study pointed to several key questions: What types of knowledge are necessary for company's viability? What information is used and is useful? To provide such alignment, the knowledge management supervisory group has to prioritize and filter their knowledge depending on how much the knowledge would contribute to realizing their goals. Moreover, knowledge helping users to do their jobs should be updated dynamically. Ultimately, the knowledge and value chains should be incorporated to contribute to enhance profitability. Otherwise, knowledge management systems can easily turn into a garbage pool, which can exacerbate the problems of knowledge overload.

While top management leadership and support is essential to the effectiveness of enterprise-wide KM initiatives, it is also important to recognize that knowledge accumulation and sharing occur voluntarily and cannot be conscripted. KM systems are only utilized when knowledge sharing activities are supported by trust and appropriate motivation. The dependence of knowledge management upon the active engagement and participation of rank-and-file organizational managers is revealed most clearly by the central role that communities of practice have played in the KM initiatives of all the oil and gas companies we surveyed.

REFERENCES

- Ambrosio, J. (2000): "Knowledge management mistakes". *Computerworld*. July 3.
<http://www.computerworld.com/industrytopics/energy/story/0,10801,46693,00.html>
- Boyd, A. (2003): "Shell's Communities of Practice: Ten Years On". Presentation. January.
- Chevron Texaco Corporation (2002): *The Chevron Texaco Way*. San Francisco.
- Derr, T.K. (1999): "Managing knowledge the Chevron way". Speech given at Knowledge Management World Summit. San Francisco, California. Available at http://www.chevrontexaco.com/news/archive/chevron_speech/1999/99-01-11.asp
- Drain, B. (2001): *Retaining Intellectual Capital in the Energy Industry*. Sapient Corporation.
- ExxonMobil Corporation (2003): *Knowledge Management in ExxonMobil Upstream*. Presentation, February.
- Gartner Group (1999): *The Knowledge Management Scenario: Trends and Directions for 1998-2003*. Gartner, 18 March.
- Grant, R.M. (1996): "Toward a Knowledge-based Theory of the Firm", *Strategic Management Journal*, Vol. 17, Winter Special Issue, pp. 109–122.
- Hansen, M.T., Nohria, N. Tierney, T. (1999): "What's Your Strategy for Managing Knowledge?", *Harvard Business Review*, Vol. 77, num. 2, pp. 106–116.
- KPMG Consulting (2002): *Knowledge Management Research Report 2000*. KPMG, October.
- Kogut, B.; Zander, U. (1992): "Knowledge of the firm, combinative capabilities and the replication of technology", *Organization Science*, Vol. 3, num. 3, pp. 383–397.
- Leavitt, P. (2002): *Applying Knowledge Management to Oil and Gas Industry Challenges*. American Quality and Productivity Center, October.
- LG Electronic Research Institute (2003): *Why knowledge management fails?*. LG Electronics.
- Nonaka, I. (1994): "A dynamic theory of organizational knowledge creation", *Organization Science*, Vol. 5, num. 1, pp. 14–37.
- O'Brien, D.; Rounce, J. (2001): "Managing knowledge management", *Oilfield Review*, Spring, pp. 66–83.
- Prokesch, S. (1997): "Unleashing the power of learning: An interview with British Petroleum's John Browne", *Harvard Business Review*, Vol. 75, num. 5, pp. 147–168.
- Slabodkin, G. (2006): *Army lessons learned*. FCW: The Business of Federal Technology. July 17.
- Wenger, E.; McDermott, R.; Snyder, W.M. (2002): *Cultivating Communities of Practice*, Harvard Business School Press: Boston.

NOTES

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Exploring Knowledge Creation and Transfer in the Firm: Context and Leadership*

Explorando la creación y transferencia de Conocimiento en la empresa: Contexto y Liderazgo

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I. INTRODUCTION

Over the past two decades, the study of knowledge creation in organizations has arisen as one of the most extensive and fruitful areas of research (Nonaka et al., 1994; Grant, 1996; von Krogh et al., 2012). Considering that “a firm can be understood as a social community specializing in the speed and efficiency in the creation and transfer of knowledge” (Kogut and Zander, 1996: 503), with tacit knowledge being of particular importance, researchers such as Spender (1996) have advocated that the main goals of organisations are the generation and application of knowledge. Organizational Knowledge Creation Theory (KCT), therefore, identifies knowledge resources and organisational learning capabilities as key drivers of innovation within the firm and of sustained competitive advantages, explaining how the organization creates, develops, shares, absorbs, and applies knowledge, both individually and collectively, and either within or outside the organization. KCT organises three key aspects into a dynamic, explanatory framework (von Krogh, Nonaka and Rechterner, 2012): i) knowledge assets; ii) leadership in knowledge creation and sharing; and iii) context in which knowledge is created and shared.

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EXECUTIVE SUMMARY

Knowledge creation and transfer in the firm are considered key tasks for managers in knowledge-intensive and high-tech industries. In order to understand these dynamic capabilities managers must be aware of the circumstances, in terms of organization and teamwork, under which knowledge is created and transferred, and whether this takes place individually or collectively, or inside or outside the firm. This paper explores some of the most prominent contributions made to this field over the last decade in order to identify and compare organizational circumstances or contexts –also known as *ba*–, distributed leadership, team atmosphere, collaborative community, and social capital, that all facilitate and constitute the ‘knowledge arena’ in the firm, and to draw conclusions that will help us advance towards a new configurational approach for future research on knowledge creation and transfer.

RESUMEN DEL ARTÍCULO

La creación y transferencia de conocimiento en la empresa son funciones fundamentales de la dirección en industrias intensivas en conocimiento y alta tecnología. Para entender estas capacidades dinámicas, la dirección debe tener en cuenta las circunstancias específicas de su organización y equipos de trabajo donde se crea y transfiere el conocimiento, tanto individual como colectivamente, dentro y fuera de la empresa. Este artículo explora algunas de las contribuciones más importantes realizadas en la última década con el fin de identificar y comparar las circunstancias o el contexto organizativo, conocidos como *ba*, el liderazgo distribuido, ambiente de equipo, comunidad de colaboración, o el capital social, que facilitan y constituyen el ‘área del conocimiento’ en la empresa, con el fin de exponer conclusiones que permitan avanzar hacia un nuevo enfoque configurativo para futuras investigaciones sobre la creación y transferencia de conocimiento.

Traditionally, both the tacit and collective nature of knowledge have been associated with difficulties in knowledge creation, and particularly, knowledge sharing

Undoubtedly, the analysis of knowledge assets has attracted extensive research that has mainly focussed on their identification and classification. One of the most firmly established knowledge asset classification frameworks is based on their epistemological –explicit and tacit– and ontological –individual, collective– dimensions (Nonaka and Takeuchi, 1995). Nonaka, Toyama and Kono (2000) classified knowledge assets as: i) experiential, which includes tacit knowledge shared through the experiences, skills and know-how of individual people, as well as their passion, tension, trust, love, and so on; ii) routines, including knowledge embedded in actions and practices as part of organisational cultures or routines; iii) conceptual, which includes knowledge articulated through images, concepts and symbols in the form of product design or brand equity, and iv) systemic assets, including systemized and packaged explicit knowledge such as documents, databases, IT, patents, licences, and so on. In this context, Teece (2000) differentiates between personal and organizational and tacit and explicit knowledge assets. Since tacit assets are difficult to buy and sell, they should be built in-house. Traditionally, both the tacit and collective nature of knowledge have been associated with difficulties in knowledge creation, and particularly, knowledge sharing, the former due to its contextual nature and transmission difficulties, and the latter due to the fact that it is embedded in organizational routines, processes and structures. In a meta-analytic review of organizational knowledge transfer, Wijk, Jansen, and Lyles (2008) highlight the ambiguity of knowledge –as derived from knowledge tacitness, specificity and complexity– as being one of the impediments to knowledge transfer. Furthermore, knowledge assets are both the basic input and output of the knowledge creation and transfer processes. Knowledge assets have also been widely analysed from a parallel theoretical development perspective, the Intellectual Capital-Based View (ICBV) (Reed et al., 2006). Intellectual capital or knowledge assets can be classified into three main categories (Nahapiet and Ghoshal, 1998; Subramanian and Youndt, 2005): i) human capital, or individual knowledge owned by a firm’s employees, including experience, abilities, learning abilities; ii) social capital, as the sum of knowledge assets which are embedded within, available through, and derived from a firm’s network of relationships; and iii) organisational capital, as the institutionalized knowledge and

codified experience residing within and utilized through databases, patents, manuals, structures, etc.

Although most of the literature has focused on knowledge assets, the other two elements in the knowledge creation and sharing process, namely leadership and context, are also important. Concepts such as distributed leadership, phronetic or wise leadership, constitute new forms of leadership that promote the creation and distribution of knowledge in the firm. As Nonaka, Toyama and Konno (2000) point out, knowledge, as a primary dynamic human process, needs to be created within a context. From a review of the literature it can be seen that the proliferation of concepts such as 'high care', 'team atmosphere', 'ba', 'collaborative community' or 'social capital' exemplify the 'terminology jungle' used to describe the contextual circumstances required to create and share knowledge assets in general, and tacit assets in particular. Although the nature and role of leadership and context in the organization has been widely studied in the literature (Nonaka and Takeuchi, 2011; von Krogh et al., 2012; Zárraga and Bonache, 2003), further development and a greater understanding of these concepts are needed in the context of organisational knowledge creation. This paper, therefore, focuses on leadership and context in order to analyse different proposals made in the literature, attempting to integrate and understand the complex circumstances or 'knowledge arena' under which knowledge is created and shared within the firm.

KEY WORDS

Knowledge creation and transfer, *ba*, team atmosphere, distributed leadership, social capital, collaborative community, knowledge arena, configurational approach

PALABRAS CLAVE

Creación y transferencia de conocimiento, atmósfera de equipo, liderazgo distribuido, capital social, comunidad colaboradora, área de conocimiento, enfoque configurativo

2. LEADERSHIP AND CONTEXT OF KNOWLEDGE CREATION AND TRANSFER: EXPLORING THE 'KNOWLEDGE ARENA'

Organizational knowledge management creation and transfer is the process of making available, amplifying and connecting the knowledge created by individuals within and between organisations (Nonaka et al., 2000). In this section, we focus on the role of leadership and context, discussing the introduction of new leadership models, the different elements involved, the scope of the context, and the role of social capital in knowledge creation and transfer. This review attempts, albeit briefly, to identify the current features of this field of research.

2.1. Distributed and Phronetic Leadership

The main task of a leader in a knowledge management and innovation context is to coordinate and manage the different

viewpoints found within both organizations and teams, promoting a high care atmosphere –creating trust among team members– as a shared space for individual and group interaction in order to create and share knowledge. In a knowledge-creating company (Nonaka et al., 2000) traditional vertical top-down leadership is displaced by distributed leadership, where leaders ‘read’ and guide the working situation to build a specific type of shared context or *ba*.

Although leadership in general, and also team leadership, has been widely studied in the organization literature (Zárraga and Bonache, 2005), little emphasis has been given to knowledge management practices. Recently, von Krogh, Nonaka and Rechsteiner (2012) attempted to bridge this gap by offering an updated review of leadership in knowledge creation and transfer. They found that leadership has a significant impact on knowledge creation in the organization, but is usually treated as a marginal variable. Leadership style theory, therefore, which deals with the style or behaviour of top managers of organisations, is one of many theories that could help clarify the dynamic and emergent process of knowledge accumulation, sharing, and creation. In their review of the literature the authors identified several leadership styles that favour knowledge creation and transfer. They highlighted roles such as ‘innovator’, ‘mentor’, ‘facilitator’, or leadership styles that emphasize human interaction, affiliation, morale, and cohesion and workplace harmony. These are leaders who spend time and effort to share their knowledge, who engage openly in role-modelling activities or ‘leading by example’, and who set aside time for strategic reflection and documenting important insights. Another style is ‘transformational vs. transactional leadership’, which focussed on motivating and inspiring team members and subordinates to give their best for the organization: to perform beyond expectations. All previous leadership styles, however, involve a centralized leadership, a centralized authority, consisting of an individual –the leader– with his or her followers.

A new type of leadership –distributed leadership– has emerged, and its primary goal in a knowledge-creating company is clear: to promote trust and a shared context for knowledge creation and transfer. Knowledge creation, however, often involves spontaneous collaboration between individuals and teams in organizations, implying that practitioners collectively identify opportunities to rely on each other’s knowledge, expectations and efforts, creating

interpersonal relationships. For von Krogh et al. (2012), a distributed leadership –leadership as a group quality that must be developed by the group members– is embedded in daily practice and based on trust, empathy and shared norms. It is characterized by spontaneous and intuitive emerging collaboration, participative decision-making, and actions, which all act as sources of leadership legitimation. Organizational processes are formalized in practice, and individuals exchange authority and co-joint leadership as a shared role in the organization. Leader-follower leadership skills are not separated and are substituted by peer influence, because skills are acquired by individuals exposed to different organizational situations in a here-and-now knowledge management setting. Finally, distributed leadership seeks to spread these skills throughout the peer structure. A parallel development of a new leadership style is the concept of distributed practical wisdom leadership –phronesis– and the wise leader (Nonaka and Toyama, 2007; Nonaka and Takeuchi, 2011). Both concepts focus on daily practice as a source of actual leadership in the pursuit of ‘common goodness’, in direct relationship with the concept of ‘ethic of contribution’ proposed by Adler, Heckcher and Prusak (2011). Leadership, instead of being static, is determined by the context and is distributed, since effective knowledge management in the firm requires the active commitment of every individual in the organization.

Phronetic leadership, derived from a specific type of knowledge labelled phronesis by the ancient philosopher Aristotle, refers to the ability to determine and undertake the best action in a specific situation to serve the common good. In other words, “a specific type of high-quality tacit knowledge acquired from practical experience that enables one to make prudent decisions and take action that is appropriate to each situation, guided by values and ethics” (Nonaka and Toyama, 2007: 378). Wise leadership (Nonaka and Takeuchi, 2011), therefore, is built or acquired by practical wisdom, and has six key abilities: i) to base decision-making on what is good for the organization and society; ii) to quickly grasp the essence of each specific situation; iii) to provide a shared context in which organizational members can create new meaning; iv) to use metaphors and stories to convert experience into tacit knowledge; v) to exert political power to bring people together; and finally vi) to guide others towards cultivating practical wisdom as distributed leadership.



2.2. Knowledge Context: *Ba*, Collaborative Community and Team Atmosphere

One of the most prominent and widespread contributions to knowledge creation and transfer in the firm has been the well-known concept of '*Ba*' –the Japanese word for 'place' (Nonaka, Toyama and Konno, 2000). *Ba* is a shared space or context in which knowledge is created, shared, and utilized through personal action and interaction. It constitutes the locus of meaning-making and is needed to contextualize information and knowledge. Through personal interaction in place and time, the individual finds the context to create and share knowledge, transforming information into knowledge.

Although face-to-face interaction is a key element in building *ba*, there are different types of *ba*. We could find physical *ba* in business spaces and offices, meetings and events, whereas virtual *ba* could appear in mailing lists, intranets, groupware tools, etc. Finally, mental *ba* could be embedded in ideals and common values shared by the members of an organization. Based on two opposing concepts, face-to-face/virtual, and individual/collective, Nonaka et al (2000) determined four types of *ba*: i) originating *ba*, face-to-face among individuals, is the shared space where individuals pool emotions, feelings and mental models, *ba* emerges through mutual care, trust, love, friendship, and commitment; ii) dialoguing *ba*, as collective face-to-face interactions, is the common place where an individual's mental models are shared and articulated as concepts; iii) systemizing *ba*, as collective virtual interactions, is the place for sharing and exchanging explicit existing knowledge in written form among a large group of individuals; and finally, iv) exercising *ba*, as individual virtual interactions, is the place where individuals embody explicit and written knowledge from virtual sources.

Another interesting approach to contextualizing knowledge creation and transfer in the firm and in teamwork is the concept of '**collaborative community**', analyzed by Adler, Heckscher and Prusak (2011). This type of community, as a powerful organizing principle, encourages people to apply and share their knowledge and skills in a flexible and self-managed teamwork setting. It requires several key elements: the definition of a clearly shared purpose, the cultivation of an ethic of contribution, and the development of a set of principles that enable people to work in flexible but disciplined group-work efforts.



Collaborative communities need to build a shared goal focusing on trust and organizational cohesion, and to position the group in relation to competitors, partners, customers, and society. "It is a description of what everyone in the organization is trying to do. It guides efforts at all levels" (Adler et al., 2011: 5). The second basic element is the ethic of contribution, as a set of values that encourage people to go beyond their roles and responsibilities to solve problems and achieve the shared goal. Ethic of contribution avoids individualisms and seeks the individual's best contributions for the common good. The third element is the development of processes that enable people to work in flexible but disciplined projects through horizontal coordination. Interactive and flexible interdependent process management allows people to build collaborative communities to foster knowledge creation and innovation in a more effective way.

Parallel to the concept of *ba*, more specifically the 'originating and dialoging *ba*', are other interesting concepts such as 'high care', 'high involvement' or 'team atmosphere' that reflect the need to build a specific context for knowledge creation and transfer, especially in face-to-face interactions in daily group work. An effective management of collective knowledge in the firm requires the intensive use of self-managed teams. Individuals, however, are usually reluctant to share their knowledge due to the free-rider effect of sharing knowledge in teams. A solution is proposed by Zárraga and Bonache (2003): team atmosphere, a context, they readily admit, that has been treated as a 'black box'.

Team atmosphere, as a cooperative solution, is based on the concepts of 'high involvement' (Lawler, 1992) or 'high care' (von Krogh, 1998) in knowledge transfer and creation among team members. Von Krogh (1998) explains the characteristics of 'high care' as mutual trust, the belief that the other team members have the ability to absorb and retain, together with active empathy, understanding 'emotionally' the other's particular circumstances. This 'team atmosphere', as the true internal collaboration between team members, could be built through several initiatives taken by the team leader, whose main task is to coordinate and focalize different viewpoints found within the team. As well as guidelines for establishing a reward system linked to knowledge sharing, the leader can provide both real and virtual spaces, or *ba*, teamwork training, and finally, social events for formal and informal interactions among team and organizational members.

2.3. Social Capital

The concept of 'social capital' as a feature of this 'knowledge arena' could also be discussed in the theoretical framework of the ICBV. As Gooderham, Minbaeva and Pedersen (2011) point out, further analysis of organizational and contextual attributes are needed in order to advance the theory of social capital in the firm. The seminal paper by Nahapiet and Ghoshal (1998) describes the key role of social capital in developing intellectual capital or knowledge assets. According to the authors, a firm, understood as a social community specialized in the creation and transfer of knowledge, has to develop social and intellectual capital as sources of distinctive organizational advantage. According to Levin and Cross (2004), research has shown that relationships, and their effective management, are critical to knowledge creation and transfer. A basic premise is that knowledge transfer occurs through interactions between individuals who are in several social relationships (Yli-Renko et al., 2001).

Nahapiet and Ghoshal (1998) offer, albeit indirectly, an integrative view of the KBV and ICBV frameworks, and define social capital as the sum of the actual as well as potential resources embedded within, available through, and derived from the network of relationships possessed by an individual or organization, including both the network and the assets that may be mobilized. For Adler and Kwon (2002: 23), "social capital is the goodwill available to individuals or groups. Its source lies in the structure and content of the actor's social relations. Its effects flow from the information, influence, and solidarity it makes available to the actor". Goodwill makes organizational resources (information, influence, and solidarity) available for individual use. In their review, definitions of social capital are grouped according to type: internal or external links, or both.

Nahapiet and Ghoshal (1998) describe the dimensions of social capital and how they facilitate the creation and exchange of knowledge: i) Structural or impersonal configurations of links between people or units. Networks configured in terms of density, connectivity, and hierarchy; ii) Relational, referring to assets created and leveraged through the kind of personal relationships, the main facets being: trust and trustworthiness, friendship, norms and sanctions, obligations and expectations, identity and identification; and finally, iii) Cognitive, being resources providing shared representations, interpretations, and systems of meaning among parties; such as shared language, codes, and mental models.

Most of the literature on social capital focuses on demonstrating its role in knowledge transfer and sharing (Wei, Zheng and Zhang, 2011) by analyzing the role of structure and the importance of social actors in forging relationship networks, the quality of these, and the role of trust (Levin and Cross, 2004) or social cohesion (Reagans and McEvily, 2003). This leads Eisenhardt and Santos (2002) to affirm that companies that transfer large quantities of knowledge do so through managers who develop a 'collaborative context' by means of culture and organizational structure.

3. CONCLUSIONS: A CONFIGURATIONAL APPROACH TO KNOWLEDGE MANAGEMENT RESEARCH

Although the study of knowledge creation in organizations has produced a huge amount of theoretical and empirical research over the past two decades, some questions and issues still need more in-depth study and analysis. This aim of this paper has been to clarify further the role of leadership and context in the knowledge creation and transfer process.

In this paper we have first analyzed new types of leadership and contextual factors that currently encompass very soft 'economic elements' such as goodwill, trust, cohesion, commitment, ethic of contribution, high care, atmosphere, wise leadership or even love and friendship. These aspects of the 'knowledge arena' are the focus of a growing number of studies and discussions on Knowledge Creation and Transfer Theory.

We have also, from an empirical research point of view, reviewed key factors involved in exploring the context for knowledge creation and transfer, highlighting the diversity of factors and their multiple connections in the context of creating a platform for knowledge management in the firm. In that sense, most empirical research has focused on a contingency approach where certain factors such as social capital, trust, team atmosphere or leadership have been treated as independent and/or contingent variables, and where these contextual variables promote, reinforce and/or impede the organizational knowledge creation and transfer processes.

Along these lines, we propose a new configurational research approach. On the basic premise that knowledge is context-specific (Nonaka et al. 2000), and depends on a particular time and space, future empirical research should analyze knowledge assets, leadership, and context jointly in a new configurational approach,

where the integrity of these business phenomena are preserved as complex configurations.

A new technique –fuzzy set Qualitative Comparative Analysis (fsQCA)– is gaining acceptance among management and strategy scholars as a reliable statistical technique that is particularly well suited to investigating configurations (Fiss, 2011; Ragin, 2000). The advantages of this technique and framework are: i) it enables us to test the propositions regarding the influence of knowledge management strategy configurations as complex sets of organizational attributes in knowledge creation and transfer (Ragin, 2000; von Krogh et al., 2012); ii) fsQCA has the advantage of being suited to small sample sizes –with less than 300 cases– and to limited diversity; and iii) as Fiss (2011) points out, some promising applications of QCA to management and strategy research include the Resource-Based View framework, and parallel developments such as the Knowledge-Based View or the Intellectual Capital-Based View of the firm.

REFERENCES

- Adler, P.; Heckcher, C.; Prusak, L. (2011): "Building a Collaborative Enterprise", *Harvard Business Review*, July-August, pp. 1–9.
- Adler, P.; Kwon, S. (2002): "Social Capital: Prospects for a New Concept", *Academy of Management Review*, Vol. 27, num. 1, pp. 17–40.
- Choo, C.; De Alvarenga Neto, R. (2010): "Beyond the Ba: Managing Enabling Contexts in Knowledge Organizations", *Journal of Knowledge Management*, Vol. 14, num. 4, pp. 592–610.
- Fiss, P. (2011): "Building Better Causal Theories: A Fuzzy Set Approach to Typologies in Organization Research", *Academy of Management Journal*, Vol. 54, pp. 393–420.
- Gooderham, P.; Minbaeva, D.; Pedersen, T. (2011): "Governance Mechanisms for the Promotion of Social Capital for Knowledge Transfer in Multinational Corporations", *Journal of Management Studies*, Vol. 48, num. 1, pp. 123–150.
- Grant, R. (1996): "Towards a Knowledge-Based View of the Firm", Vol. 17, num. 7, pp. 109–122.

- Levin, D.; Cross, R. (2004): "The strength of weak ties you can trust: The mediating role of trust in effective knowledge transfer", *Management Science*, Vol. 50, num 11, pp. 1477–1490.
- Nahapiet, J.; Ghoshal, S. (1998): "Social capital, intellectual capital, and the organizational advantage", *Academy of Management Review*, Vol. 23, pp. 242–266.
- Nonaka, I.; Byosiére, P.; Borucki, C.C.; Konno, N. (1994): "Organizational knowledge creation theory: a first comprehensive test", *International Business Review*, 3, 337–51.
- Nonaka, I.; Takeuchi, H. (1995): *The knowledge creating company: how Japanese companies create the dynamics of innovation*. New York: Oxford University Press
- Nonaka, I.; Takeuchi, H. (2011): "The Big Idea: the Wise Leader", *Harvard Business Review*, May-June.
- Nonaka, I.; Toyama, R. (2007): "Strategic Management as Distributed Practical Wisdom (phronesis)", *Industrial and Corporate Change*, Vol. 16, num. 3, pp. 371–394.
- Nonaka, I.; Toyama, R.; Konno, N. (2000): "SECI, Ba and Leadership: A unified model of dynamic knowledge creation", *Long Range Planning*, Vol. 33, pp. 5–34.
- Raggin, C. (2008): *Redesigning social inquiry: Fuzzy sets and beyond*. Chicago, University of Chicago Press
- Reagans, R.; McEvily, B. (2003): "Network structure and knowledge transfer: The effects of cohesion and range", *Administrative Science Quarterly*, Vol. 48, pp. 240–267.
- Reed, K.; Lubatkin, M.; Srinivasan, N. (2006): "Proposing and testing an intellectual capital-based view of the firm", *Journal of Management Studies*, Vol. 43, pp. 867–893.
- Spender, J.C. (1996): "Making knowledge the basis of a dynamic theory of the firm", *Strategic Management Journal*, Vol. 17, pp. 45–63.
- Subramaniam, M.; Youndt, M.A. (2005): "The influence of intellectual capital on the types of innovative capabilities", *Academy of Management Journal*, Vol. 48, pp. 450–463.
- Teece, D. (2000): "Strategies for managing knowledge assets: The role of firm structure and industrial context", *Long Range Planning*, Vol. 33, p. 35–54.
- Von Krogh, G. (1998): "Care in Knowledge Creation", *California Management Review*, Vol. 40, num 3, pp. 133–153.
- von Krogh, G.; Nonaka, I.; Rechsteiner, L. (2012): "Leadership in organizational knowledge creation: A review and framework", *Journal of Management Studies*, Vol. 49, num. 1, pp. 240–277.
- Wei, Zheng; Zhang (2011): "Social capital and knowledge transfer: A multi-level analysis", *Human Relations*, Vol. 64, num. 11, pp. 1401–1423.
- Wijk, R.; Jansen, J.; Lyles, M. (2008): "Inter- and intra-organizational knowledge transfer: A meta-analytic review and assessment of its antecedents and consequences", *Journal of Management Studies*, Vol. 45, num. 4, pp. 830–853.
- Yli-Renko, H.; Autio, E.; Sapienza, H.J. (2001): "Social capital, knowledge acquisitions, and knowledge exploitation in young technology-based firms", *Strategic Management Journal*, Vol. 22, pp. 587–613.
- Zárraga, C.; Bonache, J. (2005): "The impact of team atmosphere on knowledge outcomes in self-managed teams", *Organization Studies*, Vol. 26, num. 5, pp. 661–681.
- Zogut, B.; Zander, U. (1996): "What do firms do? Coordination, identity, and learning", *Organization Science*, Vol. 7, pp. 502–518.

NOTES

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