ORGANIZATIONAL KNOWLEDGE CREATION AND MANAGEMENT

Max Boisot
Professor of Strategic Management, ESADE, Barcelona, Spain

Keywords: knowledge management, codification, diffusion, abstraction, learning, intellectual capital, information economy.

Contents

1. Introduction
1.1. Historical Background
1.2. The Present
1.3. Outstanding Issues
2. What is Knowledge?
2.1. Abstraction
2.2. Codification
3. Learning and the Generation of New Knowledge
3.1. Learning Opportunities
3.2.Knowledge Generation
4. Social Knowing
4.1. Knowledge Sharing
4.2. Knowledge Absorption
5. Managerial Implications
5.1. The Paradox of Value
5.2. Governance
5.3. Strategy and Organization
5.4. Operational Level
6. Conclusion
Glossary
Bibliography
Biographical Sketch

Summary

With the rapid development of information and communication technologies (ICTs) knowledge management is gaining in importance as a discipline. Although the subject is not new – in one form or another a concern with the effective management of knowledge resources has been around since the scientific revolution of the sixteenth century – technological evolution is giving it a new lease of life.

One impulse for the subject's development is a growing awareness that knowledge cannot be managed as if it were a physical resource. There is still, however, little agreement as to what knowledge is. The article suggests that it differs in important ways from data and information: knowledge is dispositional – a property of agents. These are concerned to save on data processing and communication resources. They do this through acts of abstraction and of codification. Taken together, such acts facilitate the

diffusion of information and, hence, also facilitate a learning process. Yet, except in the case of tacit knowledge, uncontrolled diffusion poses problems of appropriability. The situation is thus paradoxical. Agents structure their knowledge in order to render it tractable and useful. But in doing so, they make such knowledge more difficult to hold on to and more difficult to exploit economically. The paradox poses a challenge for the governance, the strategy, and the operations of organisations. The critical issue facing them is what knowledge to hold on to, what knowledge to share selectively, and what knowledge to let go of. To manage knowledge is basically to manage a metabolic process: rates of knowledge acquisition must ultimately be matched by rates of knowledge disposal or forgetting if learning is effectively to take place.

1. Introduction

Knowledge management has recently moved up the corporate agenda in many firms. Some corporations have appointed Chief Knowledge Officers, others Directors of Intellectual Capital. Conferences on the subject are proliferating, and many consulting firms are now adding knowledge management skills to their repertoire. Why the sudden interest in Knowledge Management?

1.1. Historical Background

In one sense, the interest is not sudden at all. Throughout the 1980s, as firms became aware that the pace of change was accelerating – driven by technological evolution, globalization, corporate restructuring etc. – they started to take an interest in the phenomenon of organizational learning and adaptation. Although organizational learning is a large and controversial subject, in one way or another it involves the capacity of an organization to generate and exploit knowledge, whether this is stored externally in documents or artefacts, or embedded in individual or group behaviors. In effect, knowledge management is dealing with essentially the same phenomenon. But whereas organizational learning was focused primarily on the dynamics of individual and group behaviors in the face of change, knowledge management is more interested in making good use of the knowledge that either emerges from or drives the process. In this sense organizational learning and knowledge management are natural complements rather than competitors.

One development that has stimulated an interest in knowledge management is the gap that is opening up between the book value and the market value of successful knowledge-intensive firms. Where these firms are traded, whether as a whole or in part, they are being bought and sold for many times their book value. One example that is sometimes cited is the Danish hearing aid maker, Oticon Holdings A/S, a firm which between 1991 and 1997 grew in value from 150 to 2.4 billion Danish Kroner. Yet of the latter value, only 400 million Kroner showed on the balance sheet. How might one account for the difference? And how do prospective purchasers of such a firm ensure that they are getting good value? The perception is growing that traditional accounting methods systematically undervalue knowledge-intensive firms. As Rich Karlgaard, editor of *Forbes ASAP* put it in a 1993 editorial, "As an index, book value is dead as a doornail, an artefact of the Industrial age". The Intellectual Capital movement,

pioneered by Skandia's Leif Edvinsson, seeks to devise robust measures of the knowledge held by a firm.

A related development that has pushed in the same direction is technological change and, in particular, the spectacular growth from the mid 1990s onward of the Internet and Internet-related businesses. Companies are discovering – sometimes the hard way - that in the emerging information economy, the ability to make good use of their knowledge assets and the ability to acquire new ones are both becoming their main source of competitive advantage.

Yet if we step back a little, we will realize that the challenges posed by the effective management of knowledge resources have been with us since the scientific revolution. The learned societies of the seventeenth century, the Académia dei Lincei in Rome (founded in 1603), the Royal Society in London (founded in 1660), and the Académie des Sciences in Paris (founded in 1666), were all concerned with the routinization of discovery and were all set up to promote the dissemination of useful knowledge. The European Scientists of the day were grappling with the same sort of issues that knowledge management is today. How to generate knowledge that is both valid and, hopefully, useful? How to share it? And how to keep in touch and up to date? Encyclopaedias provided one way of storing and providing access to newly created knowledge. The nascent scientific community provided another. The key to the effective growth and management of scientific knowledge was as much social and institutional as it was technological. Technology to be sure, was a trigger: the scientific revolution would not have been possible without the development of printing, the substitution of vernacular languages for Latin, and the subsequent spread of literacy. Yet the emergence of learned societies with their corresponding secretaries, their frequent meetings, and their periodical journals, were as much the product of values and new habits of thought as they were of new means of communication.

If an effective way could be found of first eliciting and then making good use of new knowledge, then one obvious beneficiary would be the state. In a mercantilist age, knowledge was perceived to contribute to the creation of national wealth and hence to the creation of a strong and competitive state. Unsurprisingly, therefore, the state attempted to foster the generation of new knowledge within its borders. Even in a later and less mercantilist age, the state retained its involvement in knowledge generation. Congress, for example, was given the duty by the US constitution "to promote the science of useful arts, by securing, for limited times, to authors and inventors, the exclusive right to their respective writings and discoveries". Was this granting of exclusive rights to newly created knowledge also intended to promote its sharing? In a roundabout way, yes, since it was only in return for making public what would otherwise be privately held knowledge that an author or inventor was granted a limited monopoly on its use.

What the above example makes clear, however, is that technological knowledge was not generated and disseminated in the same way as scientific knowledge. In the latter case, the scientific community would reward the creation of valid knowledge by using it and by offering its creator esteem and peer recognition. In the former case, a broader community would reward the valid creation of technological knowledge by using it and

paying for it. If the scientific community was engaged in gift exchanges, the technological community was engaged in trade.

It was not until the last three decades of the nineteenth century, that a number of business enterprises – particularly those operating in the newly emerging chemical and electrical industries -- began to concern themselves with the systematic creation and exploitation of knowledge for commercial purposes. It was at this time that the modern research laboratory first made its appearance. Research and development activities systematically applied knowledge management principles inside one or two departments within an organization. It greatly accelerated the pace of innovation from what had gone before and effectively helped to usher in the second industrial revolution.

To summarize, it is clear that knowledge management is no new kid on the block! Nevertheless, it is fair to say that it was only in the 1990s that managers in a large number of firms began to address issues that scientists have been grappling with for well over three hundred years. What distinguishes the current corporate interest in knowledge management from what has gone before, perhaps, is that the kind of knowledge that is of interest today is as likely to arise outside the R and D laboratory as inside it, and covers all facets of a firm's activities. Yet, instead of asking why firms have suddenly become interested in this area, one might reasonably ask, what kept them?

1.2. The Present

One answer is that firms can only afford to concern themselves with what is observable and measurable, and in many, if not most, cases knowledge is neither. It often resides deep in people's heads and it can be quite discontinuous in its effects. If firms have only recently become interested in managing their knowledge resources, it is because data processing, storage and transmission costs have now dropped to the point where it becomes worth addressing the observability and measurability issues. Whether knowledge itself has actually become any more measurable as a result of such falling costs is still a matter of controversy, the claims of the proponents of intellectual capital notwithstanding.

A second answer which complements the first is that the rapid evolution of information and communications technologies has led to the "dematerialization" of economic activity – the substitution of data and information for physical resources -- in many areas. Automobiles, for example, are getting lighter every year and are becoming "information rich". And computers themselves are being miniaturized even as their data processing power continues to multiply. As we rejoice at the convenience and the energy savings made possible by this dematerialization, we suddenly find ourselves having to deal with ever-larger quantities of data. In some cases, we become literally overwhelmed by the stuff, and overload threatens. The only way to deal with data overload is to extract useful information from it faster and more efficiently than before – i.e., to increase the rate at which we metabolize data. Knowledge management might help us to achieve this increase.

Finally, underpinning the recent interest in knowledge management is a belated recognition that while information may be substituted for energy in many fields, one cannot manage a knowledge resource as if it was a physical resource. Although this is now changing, economists have traditionally approached knowledge with a certain schizophrenia, treating it at their convenience as being either completely appropriable and hence behaving in economic terms like a tradeable physical good, or as being a public good whose supply is infinitely elastic and whose consumption is not subject to crowding. Yet, as anyone involved in its creation will know, knowledge evolves over time and can move either in the direction of full appropriability or in the direction of free availability. It is at its most interesting – and, unfortunately, at its most analytically intractable -- when it can be located somewhere between these two poles.

-
-
-

Bibliography

Arthur, B., (1994) *Increasing Returns and Path Dependence in the Economy*, Ann Arbor, Michigan: University of Michigan Press. [A collection of Arthur´s papers. Arthur provides a powerful economic perspective on the dynamics of knowledge flows.]

Boisot, M., (1998) *Knowledge Assets: Securing Competitive Advantage in the Information_Economy*, Oxford: Oxford University Press. [A further development of the arguments presented in this article. It provides a conceptual framework, the Information Space of I-Space, for the study of knowledge flows.]

Edvinsson, L., (1997) *Intellectual Capital: the Proven Way to Establish your Company´s real values by Measuring its hidden Brainpower*. New York: Harper Business. [Written by one of the founders of the Intellectual Capital.]

Klein D. (Ed.), (1998) *The Strategic Management of Intellectual Capital*, Boston: Butterworth – Heinemann. [A useful collection of key academic papers in the field]

Leonard-Barton, D., (1995) *The Wellsprings of Knowledge: Building and Sustaining the Sources of Innovation*, Boston, MA: Harvard Business School Press. [A strategic and corporate perspective in knowledge management.]

Nonaka, I. and Takeuchi, H., (1995) *The Knowledge-creating company: how Japanese Companies create the dynamics of Innovation*, New York : Oxford University Press. [One of the key texts in knowledge management.]

Tapscott, D., (1996) The Digital Economy: Promise and Peril in the Age of Networked Intelligence New York: McGraw Hill. [An Internet Perspective on Knowledge management.]

Polanyi, M., (1958) Personal Knowledge: towards a Post-Critical Philosophy, London: Routledge and Kegan Paul. [A founding text that provides much of the philosophical underpinning for how we think of knowledge management.]

Von Krogh, G., J. Roos and Dirk Kleine. (Eds.), (1998), *Knowing in Firms*, Thousand Oaks, CA: Sage. [Provides a theoretical framework for theories of knowledge, organizational learning, and the value of knowledge. It is targeted at an academic readership.]

Weik, K., (1995) *Sensemaking in Organizations*, Thousand Oaks, CA: Sage. [A text that takes knowledge flows to be driven by social processes. Aimed at an academic readership.]

Biographical Sketch

Max Boisot is Professor of Strategic Management at E.S.A.D.E. in Barcelona, Senior Associate at the Judge Institute of Management Studies at the University of Cambridge, and Associate Fellow at Templeton College, Oxford. He holds an MSc in Management from M.I.T. as well as a doctorate in technology transfer from the Imperial College of Science, Technology and Medicine, London University. From 1984 to 1989 he was dean and director of the China-EC Management Program, the first MBA programme to be run in the People's Republic of China in Beijing. The program has today evolved into the China-Europe International Business School (CEIBS) in Shanghai. Since 1994 he has set up the Euro-Arab Management School in Granada, Spain, for the EU Commission. Max Boisot has carried out consultancy and training assignments for a number of multinational firms -- BP exploration, GEC-Alsthom, Thomson CFS, UBS, are the most recent ones -- in the field of international management and technology strategy. His current research into knowledge management and competence building is being conducted at the Wharton School, where he is a visiting research fellow. In addition to his China experience, Max Boisot has taught in Japan, the US, Hong Kong, South East Asia, the Middle East, Russia and France. He is the author of *Information and Organizations,* (1987, Harper Collins), *Information Space: a framework for analyzing learning in organizations, institutions, and cultures* (1995, Routledge), and *Knowledge Assets : Securing Competitive Advantage in the Information Economy* (1998, Oxford University Press)