

Where did knowledge management come from?

by L. Prusak

In this essay I look at the history of knowledge management and offer insights into what knowledge management means today and where it may be headed in the future. This is an updated version of an article first published in Knowledge Directions, the journal of the Institute for Knowledge Management, fall 1999.

Now that knowledge management is widely known and practiced in many large organizations, it might be useful to look back a bit and try to give some perspective on how this old but new subject developed and, in particular, what some of the specific antecedents of today's knowledge management movement are.

Some skeptics may argue that consultants developed knowledge management to replace declining revenues from the waning re-engineering movement. Others may feel that knowledge management is just a "re-badging" of earlier information and data management methods. Perhaps the majority of skeptics take the position—not an unnatural one—that every so-called new approach is, in reality, either old or wrong. I would say to them that knowledge management, like any system of thought that has value, is both old and new, and its combination of new ideas with ideas that "everyone has known all along" should reassure practitioners rather than unnerve them. And while the idea of consultants looking for a profitable new subject to replace an expiring one has some credibility, the fact is that knowledge management is not just a consultants' invention but a practitioner-based, substantive response to real social and economic trends. Let us briefly examine

three of them: globalization, ubiquitous computing, and the knowledge-centric view of the firm.

Globalization is the most obvious and clearest culprit. The complexity and volume of global trade today is unprecedented; the number of global players, products, and distribution channels is much greater than ever before. The speeding up of all elements of global trade—mainly because of information technology—and the decline of centralized economies have created an almost frenetic atmosphere within firms, which feel compelled to bring new products and services to wider markets ever more quickly. This combination of global reach and speed compels organizations to ask themselves, "What do we know, who knows it, what do we not know that we should know?"

An unintended consequence of ubiquitous and transparent computing is the premium value of knowledge that cannot be digitized, codified, or easily distributed. As access to information dramatically expands, so that people increasingly have access to almost all the information they might need at any time and in any place (and, surprisingly, at low or no cost), the value of the cognitive skills still unreplicable by silicon becomes greater. Subsequently, knowledge components such as judgment, design, leadership, better decisions, persuasiveness, wit, innovation, aesthetics, and humor become more valu-

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able than ever before. After the last few decades, when many commentators argued that information is the ultimate object of every firm's quest, the value of these more knowledge-intensive skills has been more and more widely recognized. The premium that firms pay for them reflects this valuation. Though we have seen a tendency—especially among vendors of software—to reductively define knowledge management as moving data and documents around, knowledge management grew out of an understanding of the critical value of these other, less digitized factors, and the clear need to devise ways to support and benefit from them.

A perhaps less evident but no less important trend is an emerging knowledge-centric view of the firm. Sidney Winter's description of firms as "organizations that know how to do things" expresses the idea most succinctly.¹ Increasingly, economists, strategy academics, and commentators agree that a firm can best be seen as a coordinated collection of capabilities, somewhat bound by its own history, and limited in its effectiveness by its current cognitive and social skills. The main building block of these capabilities (or unit of analysis, if you prefer) is knowledge, especially the knowledge that is mostly tacit and specific to the firm. These ideas have had a significant impact on executives through academic writings, management programs, courses, and conferences. Although the new ideas have not totally displaced older ideas of firms as primarily information processors, productive machines, or quasi-military structures, they have proved potent enough to act as a spur to real action in organizations. Consequently, the phrase "let's do something about knowledge" has been heard in the land.

Having been present when that cry first went out—being one of a small group of practitioners who began to talk and write about knowledge management about nine years ago—I feel qualified to discuss its origins. Perhaps a good milestone to mark the beginning of the knowledge management timeline is a conference held in Boston in early 1993 that several colleagues and I organized—the first conference specifically devoted to knowledge management. To our surprise, it attracted more than 150 paid attendees and many interested hangers-on. With varying degrees of success, many of the speakers at this event tried to define organizational knowledge to differentiate it from data and information. To those at the conference, knowledge seemed to be a key residual—what remained to explain internal productivity after everything else was accounted for. Also, attendees

felt (even if only as a form of unease) that even "perfectly" managed information would not lead them to the promised land of greatly improved productivity or innovation. Because the subject was so new and untested, much of the discussion remained theoretical. But there were a few promising "real-time" knowledge projects to point to.

McKinsey & Company was trying to go beyond the electronic document management systems being constructed by other consulting organizations, to develop a more human network-response system. General Motors Corporation had initiated some diverse knowledge projects under Chief Knowledge Officer Vince Barabba. And Arian Ward at Hughes Aerospace and Electronics Company was responsible for an innovative system to capture information about recurrent problems in satellite development and how these problems were resolved. That work quickly proved its value in shorter development cycles and fewer errors. High-tech organizations including Xerox Corporation, Hewlett-Packard Company, and IBM were also early explorers of knowledge practices (with varied success), trying to apply their undoubted technological capabilities to managing knowledge. Several pharmaceutical firms had some early successes in knowledge management, most memorably Hoffman-LaRoche Ltd. and Merck & Company.

These knowledge-related conversations and initiatives were new, but nothing comes from nothing. They had both intellectual and practical sources. Looking at some of those sources might give us a reasonably good picture of where the practice of knowledge management came from, what its important elements were then, and still are today.

There is, of course, continual two-way traffic between the worlds of theory and practice. I distinguish here between intellectual and practical antecedents for rhetorical convenience, but they are not as distinct as this treatment suggests. Reality is far more blended, messier, and more interesting.

Intellectual antecedents

I present these in order of salience from most to least critical. The relative importance of these disciplines helped define knowledge management as we know it.

Economics. During World War II, observers noted that building the second airplane of a given type took considerably less time than the first one, and the sec-

ond airplane had fewer defects than the first. In other words, it was proven that workers really did learn from experience. In the fifties, the Rand Corporation began to analyze and codify observations of this type. The phenomenon was given its classic expression in Nobel Prize-winning economist Kenneth Arrow's 1962 article, "Learning by Doing."²

The methods Arrow and others described provide a powerful *raison d'être* for knowledge management, although we are still some distance away from fully understanding the true mechanics of learning. If organizations can manage the learning process better—the most effective ways to pass on the often tacit understandings that form the basis of how they operate—then clearly they can become more efficient. Developing these learning strategies has subsequently become an important knowledge management theme.

With regard to learning, another driver of knowledge management that comes directly from economics, and more directly from practitioners, is how to account for significant performance variation. Why is it that organizations that have similar global operations often see their output vary substantially, even though the workers of the firm have access to the same knowledge, technologies, and all other corporate assets?

When BP (now BP Amoco) decided to analyze, using a knowledge perspective, why they had such differing performance levels in their deep-water drilling rigs, they found wide differences in local knowledge and practices, knowledge that was mostly tacit and undocumented. As a result of their efforts to have this local knowledge more globally practiced, BP achieved very significant savings and subsequently achieved legendary status within knowledge management circles.

Organizational learning has of course been a subject and source of organizational practice independent of knowledge management, but organizational learning people often fail to take the hard constraints against learning into account. They tend to believe "if you develop a process, learning will occur." Also, there is very little economics or sociology in their work; they fail to specify how learning occurs and what business and economic outcomes we can expect from learning. Knowledge management has not yet completely mastered these issues, but it recognizes their importance and continues to work toward deeper understanding of them. Another essential

question in economics—"What is the unit of analysis and how do we measure it?"—has become an essential knowledge management question. We are making clear progress on this issue, looking more and more at groups and networks as the focal points of organizational knowledge.

Sociology. Sociology has contributed both macro and micro perspectives to knowledge management. The first rigorous attempts to define a postindustrial,

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knowledge-based society were made by sociologist Daniel Bell and sociologically oriented economist Fritz Machlip, among others.³ Their documentation of this momentous change—the underlying principles for working with knowledge—crystallized and validated a dawning sense that something quite different was happening globally in the world of work.

At the micro level, sociology's strong research interest in the complex structures of internal networks and communities has obvious relevance to knowledge management. As I have suggested, most practitioners today would probably agree that knowledge exists and grows mainly in these structures, and they have begun to study networks and communities as the most productive units of analysis for doing knowledge work.

In his pioneering sociological work, Emile Durkheim emphasized "social facts,"⁴ the real, observable behaviors that should underlie sociological thinking. Knowledge management has inherited that concern for social facts. Rather than build from theory, it looks at what people actually do—the circumstances in which they share knowledge or do not share it; the ways they use, change, or ignore what they learn from others. Those social facts guide (or should guide) the development of knowledge management tools and techniques.

Philosophy and psychology. Almost from the beginning, knowledge management has explored the dif-

ferences between tacit and explicit knowledge, between “know how” and “know what.”⁵ This essential distinction, first made by Aristotle, seems to have been forgotten during the years after World War II, when an extraordinary amount of systems development occurred and much routine commercial work was computerized. In recent decades, burgeoning electronic information storage has made access to vast quantities of information a given in developed nations. A consequence that may seem paradoxical to some but in fact makes clear sense, is the subsequent dramatic increase in the value of tacit, undigitized knowledge.⁶ That value has two sources: one is scarcity—the value of the expertise that is not readily copyable and widely accessible; the other is the role of that knowledge in organizing and selecting from the flood of information so that it can be put to use.

One of the early accomplishments of knowledge management has been to reacknowledge Aristotle’s important distinction and begin to work with it. Psychology too is concerned about different kinds of knowing as well as about how and why people learn, forget, ignore, act, or fail to act. It looks at natural cognitive processes and raises questions of will and motivation that make it impossible to think of knowledge in terms of mechanical transfer from donors to recipients.

Taken together, the conceptual rigor of economics, the observational richness of sociology, and the understandings of philosophy and psychology give knowledge management the intellectual scope and substance it needs to wrestle with the real human and structural complexities of knowledge in organizations.

Practices

The three practices that have brought the most content and energy to knowledge management are information management, the quality movement, and the human factors/human capital movement.

Information management developed during the seventies and eighties and is usually understood as a subset of the larger information technology and information science world. Information management is a body of thought and cases that focus on how information itself is managed, independent of the technologies that house and manipulate it. It deals with information issues in terms of valuation, operational techniques, governance, and incentive schemes. “In-

formation,” in this context, generally means documents, data, and structured messages.

In broad terms, knowledge management shares information management’s user perspective—a focus

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on value as a function of user satisfaction rather than the efficiency of the technology that houses and delivers the information. Information technology focuses, for instance, on how many bits an electronic pipeline can carry; information management and knowledge management focus more on the quality of the content and how much it benefits the recipient and the organization for which he or she works. Information management discovered that not all information is created equal, that different types of information have different values and need to be handled differently. This insight—which is more true of knowledge—remains at the heart of knowledge management today. We see it in our ongoing discussions of what techniques and technologies are appropriate for sharing different kinds of knowledge and in our focus on knowledge use, not just knowledge availability.

The quality movement focused significantly on internal customers, overt processes, and shared, transparent goals. While knowledge management has not yet achieved the levels of measurable success that the quality movement can claim, it has usefully borrowed these three goals and adapted them to the somewhat different aims of knowledge management. Quality techniques were applied most successfully to manufacturing processes, while knowledge management has a broader scope, including processes that do not seem to lend themselves readily to measurement or even clear definition. Yet much knowledge work involves making knowledge visible and therefore developing knowledge processes, process owners, and governance structures in ways that owe a significant debt to the techniques of analysis and improvement developed by the quality movement.

The human capital approach has a strong and well-known theoretical base.⁷ In practice, though, our un-

derstanding of the value of human capital (and the importance of investing in it) tends to get distorted or diluted. The essential message from investigators of human capital is the financial advantage to states and firms of investing in individuals, mainly through education and training. This kind of investment has a higher return rate (in the form of higher worker productivity, skills development, innovative capacity, and ease of labor mobility) than many or all other options. Yet many organizations continue to think of their employees and their education programs as expenses rather than investments.

Ideas about human capital and how it can be developed to increase innovation and productivity are still in the early stages of being established in firms. By definition, human capital focuses on the individual, whereas most knowledge management work is concerned with groups, communities, and networks. Nevertheless, knowledge management builds on human capital ideas and has, as one of its tasks, to continue making the value of human capital clear to organizational leaders while developing tools and techniques for investing and reaping benefits from it. However, it is becoming more concerned with group knowledge and the processes of social capital that undergird group knowledge.⁸

The past and the future

Although this essay is mostly about the origins of knowledge management, looking at the past is one good way to try to understand something about the future. Knowledge management seems likely to follow one of two future paths. The better one is the direction taken by the quality movement. Its key ideas became so deeply embedded in practices and organizational routines that they became more-or-less invisible. The quality movement can boast considerable success, saving several firms and industries from being replaced by more quality-conscious competitors and contributing valuable and sustainable concepts, vocabularies, and work processes to the pursuit of organizational effectiveness.⁹ Some commentators have assumed that the absence of quality from center stage in management discussion suggests its failure; in fact, the opposite is true. People do not talk about it much because it is a given, an integral element of organizational effectiveness. Knowledge management may similarly be so thoroughly adopted—so much a natural part of how people organize work—that it eventually becomes invisible.

A less appealing path would be similar to the one taken by re-engineering. While the re-engineering movement began with viable and valuable intentions, it was quickly hijacked by a host of opportunists. It became a byword for a crude, reductionist downsizing that has created no permanent value to organizations and in fact did a lot of harm. As a result, the practical legacy of re-engineering is almost nil. In fact, some of the good ideas that re-engineering advanced have been unfairly discredited by their association with what re-engineering became. The same thing could happen to knowledge management.

Two paths, two directions. I cannot predict what people will be saying about the knowledge management movement five years from now, but my hope is that the intellectual and experiential legacy I describe in this essay has given it substance and validity that cannot be readily hijacked by sales representatives and sloganeers. Practitioners reading this brief history can help keep knowledge management on the better path by drawing on that legacy for their own thinking and action, maintaining a tolerance for ambiguity and complexity and a striving for rigor that define the best of knowledge management.

Cited references and notes

1. S. G. Winter, "On Coase, Competence, and the Corporation," *The Nature of the Firm*, Oxford University Press, Oxford, UK (1993).
2. K. Arrow, "The Economic Implications of Learning by Doing," *Review of Economic Studies* 29, No. 3, 153–173 (June 1962) and R. Solow, *Learning from "Learning by Doing,"* Stanford University Press, Stanford, CA (1992).
3. See D. Bell, *The Coming of Post-Industrial Society: A Venture in Social Forecasting*, Basic Books, reissue edition (1999) and F. MacHlup's three books from Princeton University Press.
4. E. Durkheim, *The Rules of the Sociological Method*, S. Lukes, Editor, translated by W. D. Halls, Free Press, New York (1982).
5. The most common citations are G. Ryle's *The Concept of Mind*, University of Chicago Press, Chicago, IL (1984), and M. Polanyi's *Tacit Dimension*, Peter Smith Pub. (1983) and *Personal Knowledge: Towards a Post-Critical Philosophy*, University of Chicago Press, Chicago, IL (1974).
6. See, for example, T. Bresnahan, "Computerisation and Wage Dispersion: An Analytic Reinterpretation," *Economic Journal* (June 1999).
7. Gary Becker and Theodore Schultz, two Nobel Prize winners, have prominently studied and written about human capital.
8. See, for example, D. Cohen and L. Prusak, *In Good Company: How Social Capital Makes Organizations Work*, Harvard Business School Press, Boston, MA (2001).
9. See the two books from R. Cole, *The Death and Life of the American Quality Movement*, Oxford University Press, New York (1995), and *Managing Quality Fads*, Oxford University Press, New York (1999).

Accepted for publication May 23, 2001.

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