



PHILOSOPHERS AND KNOWLEDGE MANAGEMENT

Knowledge management: a program for education and leadership

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Introduction: from knowledge to knowledge management

Everybody knows what knowledge is – or at least believes they know what knowledge is. In any case, everybody has a tacit, individual, and subjective understanding of the term ‘knowledge’; everybody uses the term ‘knowledge.’

Yet, nobody can claim to know what knowledge finally is; at least, the philosophers offer a colorful bouquet of insight into knowledge (see the section ‘Knowledge, the term, its content, and the internal stages’).

Knowledge is often seen as a critical success factor – for individuals, for enterprises, for nations, etc. (see the section ‘Knowledge as critical success factor’).

Knowledge is occasionally considered within a triple of information, knowledge, and opinion, comprised in the term of ‘organizational intelligence (OI).’ This is based on management of information, management of knowledge, and management of opinion (see the section ‘organizational intelligence’). Knowledge, its storage, its distribution, its transportation, and many ways of its processing require support by information technology (IT) (see the section: ‘IT support of knowledge management’).

The content of this contribution is partly programmatic, in that foundations will be presented for education in knowledge management as well as for leadership based upon knowledge management.

One of the questions that accompany the whole paper is ‘Can computers (or books) possess knowledge?’ or in contradiction: ‘Does knowledge always require (human) consciousness?’ The readers might try to ask their computers: ‘What do you know?’ They may come to the conclusion that the computers do not even understand the question.

Knowledge, the term, its content, and the internal stages

Some people, particularly politicians, speak pompously of the ‘knowledge society’ and the ‘knowledge age,’ etc. Do we really live in a knowledge society and have we arrived at the knowledge age?

The philosopher Immanuel Kant (1724–1804) asked a similar question in 1784: ‘If it is now asked whether we at present live in an *enlightened* age, the answer is No, but we do live in an age of *enlightenment*. As things are at present, we still have a long way to go before men as a whole can be in a position (...) of using their own understanding confidently and well (...), without outside guidance’ (Kant, 1991, p. 58).

The contemporary philosopher Jürgen Mittelstrass (1936–) warns that we all are in danger of becoming ‘information giants,’ but, at the same time, ‘knowledge dwarfs’ (Mittelstrass, 1992, p. 221; also Müller-Merbach, 2006c, p. 331).

The questions from the beginning of this section, repeated – and answered in Kant’s way: Do we at present live in a knowledge society? No, but we do live in a society of affluent information. Have we arrived at the knowledge age? No, but we are almost ‘information giants,’ even if we remain ‘knowledge dwarfs.’ There seems to be a long way ahead

before people as a whole enter the knowledge age and before any nation reaches the maturity of a knowledge society.

In this section, three aspects of knowledge will be considered: (i) contributions of philosophers to the term and the content of knowledge (the subsection 'Knowledge in philosophy'); (ii) terminological systems (the subsection 'Knowledge and networks of related terms'); (iii) individuality of knowledge (the subsection 'Knowledge and the individual internal stages').

Knowledge in philosophy

Six different aspects of 'knowledge in philosophy' will be considered: (i) French rationalism vs British empiricism; (ii) the four causes of Aristotle; (iii) Plato's doctrine of ideas; (iv) Heraclitus and Parmenides, that is, dynamic change vs static states; (v) type and token; and (vi) Mittelstrass's triad.

In general dictionaries, knowledge is usually defined with respect to the individuals as well as in the sense of the collective 'knowledge of the world,' such as

- **'knowledge n. 1** the fact of knowing; awareness; understanding. **2** what one knows; the information one has acquired through learning or experience. **3** learning; the sciences: *a branch of knowledge*' (Chambers Pocket Dictionary, 1992, p. 501).
- **'knowledge n.1** the fact or state of knowing, **2** range of information or understanding, **3** what is known; learning, **4** the body of facts, etc. accumulated by mankind' (Webster's New World Dictionary, 1990, p. 328).

Philosophical dictionaries are much richer in their details; for example Angeles (1992, pp. 156–160) offers 20 entries on 'knowledge,' most of them with reference to one particular philosopher for each entry.

French rationalism vs British empiricism: the two sources of knowledge

The creation of knowledge has two major sources, the mind and the senses. For Descartes (1596–1650): 'All knowledge is derived by a deductive process' (Angeles, 1992, p. 157; Müller-Merbach, 2007a, p. 64). Russell (1961, p. 549) interprets him: 'Knowledge of external things must be by the mind, not by the senses.' In contrast, for the British empiricists such as John Locke (1632–1704) and David Hume (1711–1776), all knowledge comes from perception, which is empirical in nature. For Russell (1961, p. 589) 'Locke may be regarded as the founder of empiricism, which is the doctrine, that all our knowledge ... is derived from experience.'

It was Immanuel Kant (1724–1804) who bridged the gap between French rationalism and British empiricism (Müller-Merbach, 2007a). He distinguished between *a priori* knowledge and *a posteriori* knowledge. 'Any triangle has 180°' is *a priori* and can be derived and proven without empirical experience. In contrast, *a posteriori* knowledge is always derived from sense experience.

It seems to be useful to distinguish between these two major sources of knowledge. *A priori* and *a posteriori* knowledge have to be taught in different ways and have to be managed differently.

The four causes of Aristotle: documentation of knowledge

Knowledge does not only differ with respect to its process of generation (*a priori* vs *a posteriori*), it can also be distinguished in relation to the content of documentation.

Aristotle (ca. 384–322 BC) suggested to describe any object by the four causes (Angeles, 1992, pp. 42f; Müller-Merbach, 2005c): (i) the *material cause*: the matter out of which a thing persists; (ii) the *formal cause*: the (external and internal) structure of a thing, its shape; (iii) the *efficient cause*: the process by which a thing has come into existence; (iv) the *final cause*: the purpose which the thing serves.

It is surprising how fully applicable the doctrine of the four causes still is for the representation of knowledge about a thing, be it a piece of nature (such as a tree), be it a piece of art (such as a sculpture), be it a machine, be it a mathematical algorithm – and its IT program, etc. The four causes can provide structure to the knowledge about any object. Russell (1872–1970) takes a statue as an example: 'The material cause of the statue is the marble, the formal cause is the essence of the statue to be produced, the efficient cause is the contact of the chisel with the marble, and the final cause is the end that the sculptor has in view' (Russell, 1961, p. 181; Müller-Merbach, 2005c).

Plato's doctrine of ideas: two realms of knowledge

A hierarchy of two kinds of knowledge came from Plato (ca. 427–387 BC) who considered the generality of knowledge. He taught us the difference between 'two general realms of knowledge: (1) the non-natural realm of eternal ideal forms (ideas) that are transcendent, unchanging, perfect, intelligible with certainty; (2) the natural realm of ordinary sensations and particular things that are temporal, changing, unstable, unintelligible, and uncertain' (Angeles, 1992, p. 158). For example, any existing tree is present in the world and can be perceived by our senses: by the eyes, by the touching hands, partly by the ears (listening to the wind in the leaves), by the smell (e.g. of the blossoms), and by the taste (of the fruit). Yet, any tree is mortal. However, Plato considered another, a higher form of existence, the existence of the 'ideas.' They are the immaterial, eternal forms (archetypes), and all existing things are imperfect copies of the eternal forms, the *ideas*. The 'idea' of a thing is the archetype of any existing, but imperfect copy of the idea, that is, the existing trees are imperfect copies of the 'idea' of 'tree' (Müller-Merbach, 2005b).

In his famous *parable of the cave* (Book VII of 'The Republic'), Plato taught us that the things that we see (or believe we see) are only the 'shadows' of reality, since the reality itself consists of the (hidden) eternal forms (ideas) as archetypes.

Type and token: two levels of knowledge

In a similar relation to Plato's two realms (eternal ideal forms vs existing things as copies of the eternal forms) is the distinction between type and token (Müller-Merbach, 2007b). Type and token (or: schema and actualization; or: universal and singular validity; or: generic and individual acts) refer to the distinction between a general structure and individual cases. Examples include the following:

- the general structure of a balance sheet (type) and the balance sheets of different companies and/or for different years (tokens),
- the general procedure of bill-of-material processing (type) and practical cases of bill-of-material processing (tokens),
- network analysis for project planning as a part of general graph theory (CPM, PERT, etc.) vs individual project planning networks.

Thorough knowledge of anything requires both familiarity with the type and experience with tokens.

Heraclitus and Parmenides: two objects of knowledge

What is more important, knowledge about *change* processes or knowledge about static *states*?

Heraclitus (ca. 544–483 BC) was the first and highly influential philosopher of change: '*Nothing endures but change,*' and: '*Nothing ever is, everything is becoming,*' and '*All things are flowing,*' and: '*Nothings stays still*' are typical formulations of his doctrine (Müller-Merbach, 2006a).

His opponent was Parmenides (ca. 540–480 BC). In contradiction to Heraclitus he taught that anything that changes is not worthy of being studied. Therefore, he concentrated his thoughts on things, which are eternal, unchangeable, that is, things, which remain in a constant state.

This is a question for knowledge management: Do we need knowledge about the state of unchangeable things or do we need knowledge about the processes of change? The two kinds of knowledge depend on one another and refer to one another. Examples are (i) the balance sheet representing the state of a company at a certain date vs the profit-and-loss account representing the processes over a period of time; (ii) the chemical structure of a material (the state), such as H_2SO_4 , vs the chemical processes to produce this substance; (iii) a bicycle or any other vehicle (the state) vs the journeys made with it (change processes).

Comprehensive knowledge requires familiarity with the static states as well as with the change processes.

Mittelstrass's triad: information and opinion as sisters of knowledge

Jürgen Mittelstrass (born 1936) distinguished clearly between information, knowledge, and opinion. For him, knowledge is always connected with consciousness and his test criterion for knowledge is 'ability to teach' (Mittelstrass, 1992, p. 331); that means that one has to understand the subject to be taught in such a depth that

he/she can redesign the content to be taught while teaching. In addition, for him knowledge requires awareness in a kind of proof structure.

In a similar way, opinion is connected to consciousness, and only living individuals can have an opinion. No machine and no book can have an opinion itself. Does the opinion not have a stronger influence on our decisions than information or knowledge? Why do we buy a car of make X, why do we prefer beer of brand Y, why do we vote for party Z? The answer is simple: '*...because I like it better (or best).*'

In contrast to knowledge and opinion, *information* is not necessarily connected with consciousness – in Mittelstrass's terminology. He even accepts that *information* can be much more efficiently stored and processed by computing machinery than by human brains. Mittelstrass even considers information as a kind of 'transportation form' for knowledge and opinion.

Concluding recommendations:

- He/she who studies knowledge management should become familiar with the manifold philosophical and other fundamental thoughts about knowledge.
- He/she who is (or is going to become) a knowledge manager ought to have a solid overview of the philosophical contributions regarding the term 'knowledge' and related terms in order to develop a rich understanding of the term.

Knowledge and networks of related terms

So, what is knowledge? Eysenck's distinction between 'things' and 'concepts' might be helpful (Eysenck, 1979, pp. 11ff.; Müller-Merbach, 2006b): things are real, such as a desk (Eysenck's example), a house, a flower, a shirt, etc. Things like these can be defined to (almost) everybody's satisfaction, and the definition can always be compared with real cases. In contrast, concepts do not have a physical representation; they are – in a sense – abstractions, such as 'knowledge,' 'intelligence' (Eysenck's example), 'motivation,' 'life,' 'love,' etc. Everybody has a tacit, individual, and subjective understanding of such concepts; and these understandings can vary remarkably from one person to another.

As far as the term 'knowledge' is concerned, some people (at least in the knowledge management scene) have no problem at all in admitting that computers can store knowledge and provide users with knowledge, can do knowledge operations and that computers are the very machinery suitable for knowledge management.

In contrast, others understand knowledge only in connection with human beings, such as Kenneth E. Boulding (1910–1993): 'Knowledge is something that exists in human nervous systems or their equivalents, whatever they may be, and nowhere else. It does not exist in libraries. (...) Knowledge as a growing organic system requires apparatus of the complexity of human life to sustain it' (Boulding, 1968, p. B-647).

Because there may exist quite different understandings of any *concept*, Eysenck suggests not to search for a generally acceptable unique definition of a concept. Instead, he suggests that everybody who talks or writes about such a concept should communicate his personal understanding of it, that is, should present his/her *'operational definition.'*

Such a definition should not be *apodictic* (i.e. 'certain beyond dispute') in the sense of 'knowledge is' Instead, softer expressions should be used, such as: 'Knowledge shall here be understood as'

In many cases, it is not sufficient to give an operational definition of one key term only. Instead, it may be advantageous to design a network of related terms, including their operational definitions.

Related terms to *knowledge* could, for example, include information, opinion, intelligence, prudence, wisdom, competence, skill, ability, capability, talent, learning, education, etc. Such a list would be the beginning. The terms actually used could then be selected from the initial list. These terms could then be combined in an ordered network, accompanied by operational definitions.

When T.S. Eliot (1888–1965), for example, said: 'Where is the wisdom we have lost in knowledge? Where is the knowledge we have lost in information?' (Eliot, 1934), he used (possibly implicitly) such a network with a (downward) hierarchy of 'wisdom' and 'knowledge,' and 'information.'

Concluding recommendations:

- He/she who studies knowledge management ought to have seen a variety of knowledge definitions and should be able to develop his/her own operational definition of knowledge within a network of related terms.
- He/she who is (or is going to become) a knowledge manager should be familiar with knowledge definitions and develop his/her own terminological network of operational definitions of knowledge, etc. – and communicate it.

Knowledge and the individual internal stages

A useful metaphor for the understanding of knowledge and particularly of learning is the *'internal stage.'* It is similar to the concept called *'The image'* by Boulding (1956) or *'internal model'* (inneres Modell) by Kirsch (1970, p. 76f.) or *'internal picture'* (inneres Bild) by Hüther (2006).

The concept of the *internal stage* will be used here as a representation of the totality of the knowledge, of the psyche and of the value system of a person (Müller-Merbach, 1980, p. 473).

The internal stage is decisive for what somebody is able to understand and to learn. He/she who is familiar with differential equations will be able to understand a particular equation of that kind and will include it into his/her internal stage; others would not. The same holds for any other kind of knowledge, be it accounting, thermodynamics, music, economic growth theory, stock exchange processes or any other field of knowledge. As

Mittelstrass (1992, p. 227) put it: 'Knowledge requires those who know' (Wissen setzt den Wissenden voraus). Particularly crucial for the internal stage may be the familiarity with *types* since this helps to enable those who know to understand the tokens more easily (see the subsection 'Type and token' above).

The internal stage is not only a representation of somebody's knowledge, but also of his/her psyche. This will be outlined by the psychological typology of *'convergers'* and *'divergers,'* as suggested by Hudson (1966; see also Mitroff, 1972). Convergers tend to think in a logical and discursive, systematic, and analytic way, and their potential lies in the solution of well-structured problems, preferably those with a clear-cut solution. Quite a few mathematicians, scientists, and engineers seem to be convergers. Divergers, in contrast, are much more fascinated by unstructured problems, even 'messes' (a term preferred by Ackoff, 1973); for such problems, there do not exist optimal solutions of any kind and different people may have different opinions about the best ways. The scale converger/diverger is a continuum, and only very few people seem to be extreme convergers or extreme divergers. Anyhow, there seems to be a correspondence between (right-handed) convergers and a dominance of the left hemisphere of the brain and between (right-handed) divergers and a dominance of the right hemisphere of the brain. Mintzberg (1976) underlines this finding with the title 'Planning on the left side and managing on the right.'

Even if the *converger/diverger* dichotomy is only one out of many different common psychological typologies, it may not be surprising that convergers and divergers tend to have quite different internal stages.

The knowledge and the psyche are not the only constituents of the internal stage; the value system is the third one. It includes the religion, the political orientation, and a variety of ethical criteria. It also includes the many individual preferences for certain products, for a political party, for a particular style of music, etc.

The internal stages may play an important role for the success of knowledge management. Knowledge managers should have a deep understanding of the internal stages in general and should be familiar with the particularities of the internal stages of individuals in their environment.

Concluding recommendations:

- He/she who studies knowledge management ought to be aware of the individual internal stages of himself/herself and of others.
- He/she who is (or is going to become) a knowledge manager should be able to understand the individuals (and to get access to their minds) via their individual internal stages.

Knowledge as critical success factor

Knowledge is often considered as a (sometimes even as: *'the'*) critical success factor – for individuals, for enterprises, for nations, etc.

This judgment is supported by the British philosopher Francis Bacon (1561–1626): ‘A man is but what he knoweth’ (Durant, 1926, p. 111; Müller-Merbach, 2005a, p. 45).

Bacon’s statement seems to be quite one-sided. Anybody’s individual personality is much richer than his/her knowledge. Anyhow, knowledge may play an important part within his/her personality. Again, a network of related terms and trait names may be collected, such as: humanity, (technical and emotional) intelligence, (technical and emotional) competence, beliefs, Weltanschauung, abilities, skill, talent, reliability, will, self-leadership, creativity, responsibility, etc.

Whatever such a network looks like, knowledge has an important role and may be considered as the central term, covering such subterms as: skill, capability, know-how, and know-why, etc.

Knowledge – understood in such a broad sense – may be seen as a critical success factor for individuals. He/she who knows more than his/her immediate competitor has a comparative advantage – at least in relation to the field of competition.

The comparative advantage through knowledge does not only hold for individuals; it applies as well to groups of any size and of any organizational structure, such as families, jazz bands, orchestras, sports teams, political parties, administrations, university faculties, and universities, enterprises, nations, etc.

However, there is a fundamental difference between individual knowledge and collective knowledge. Collective knowledge requires some kind of organization and leadership, that is, ‘knowledge management’ (if consciously carried out), thoroughly discussed in the literature on the ‘learning organization’ and ‘organizational learning.’

However, not just any knowledge can be a success factor. Only purposeful knowledge can contribute to a success.

The main difficulty of knowledge management – particularly in the sense of a critical success factor – is the selection of knowledge: The Labour Party in the U.K. needs a different selection of knowledge from the Conservative Party, British Gas another selection than BP, the banking industry different knowledge than insurance firms, food technology a different kind of knowledge than coal mines, etc. Production has different sources of knowledge than procurement, sales is different from finance, accounting different from R&D, etc.

It belongs to the duties of knowledge management to steer the processes of knowledge acquisition, storage of knowledge, processing of knowledge, distribution of knowledge, etc. In any organization, knowledge management has continually to answer questions such as: ‘Which knowledge do we have to extend?’ and: ‘Which are the strengths and the weaknesses of our (collective) knowledge?’ and: ‘Who shall know what?’ and: ‘Which knowledge do we need for which purpose?’ etc.

Concluding recommendations:

- He/she who studies knowledge management ought to have a theoretical basis of how to select knowledge for different purposes (and functions) under the criterion of being a critical success factor.
- He/she who is (or is going to become) a knowledge manager should be able to actively steer the knowledge distribution processes within his/her reach of influence.

Knowledge management and ‘OI’

In some form of parallel to knowledge management there was a movement (or a set of management doctrines) under the label of OI. It started with Wilensky (1967) and received some momentum from the work of Takehiko Matsuda (1929–1999) and many of his pupils. A first climax was reached in 1992 with an international conference in Tokyo (Matsuda, 1992), a second climax with the first flood of books on OI by 1996/1997, such as McMaster (1996): ‘*The Intelligence Advantage*,’ Pinchot and Pinchot (1996): ‘*The Intelligent Organization*,’ Segil (1996): ‘*Intelligent Business Alliances*,’ Allee (1997): ‘*The Knowledge Evolution – Expanding Organizational Intelligence*,’ Dhar and Stein (1997): ‘*Seven Methods for Transforming Corporate Data into Business Intelligence*,’ Kirn (1997): ‘*Enhancing Organizational Intelligence through Cooperative Problem Solving*,’ Stewart (1997): ‘*Intellectual Capital*,’ Momm (1997): ‘*Die intelligente Unternehmung*,’ Edvinsson and Malone (1997): ‘*Intellectual Capital*,’ Sveiby (1997): ‘*The New Organizational Wealth*,’ etc., following the early book by Quinn (1992): ‘*The Intelligent Enterprise*.’

This was the first wave of publications about OI. It is remarkable that most of the contributions did not refer to one another. In spite of similarities, the approaches were quite different. Several authors did not even refer to the pioneers such as Wilensky and Matsuda.

The first wave included contributions by the author (such as Müller-Merbach, 1995, 2004). He suggested to cover (i) information management, (ii) knowledge management, and (iii) opinion management under the umbrella of ‘OI.’ In close relation to Mittelstrass (see above) he distinguished between information, knowledge, and opinion and considered the three objects of management as a totality. For Müller-Merbach, only information can be processed and stored on IT as well as in books, etc. By contrast, he considers knowledge and opinion as dependent upon human consciousness. Opinion may even play a more important role for human decisions than information or knowledge. Why do people buy a car of make A, B, or C? Because of their opinion that this one is the best for their purpose. Why do people vote for party K, L, or M in general elections? Because of their opinion that this party serves their interests in the best way. Why do students choose university X, Y, or Z? Because of their opinion that they would get the best return on their investment.

Thus, it is suggested to practice information management, knowledge management, and opinion management

as a unit, that is, in a comprehensive and holistic way. The education programs should be extended accordingly. Concluding recommendations:

- He/she who studies knowledge management ought to try to extend the scope in the sense of OI, consisting of (a more technical) information management as well as (a more human-oriented) knowledge management and opinion management.
- He/she who is (or is going to become) a knowledge manager should try to extend his doctrines of knowledge management to include information management as well as opinion management in order to practice a more holistic leadership.

IT support for knowledge management

Even if (in the author's understanding) knowledge depends strongly on the individual consciousness, knowledge management can efficiently be supported by IT, independent from the question of extension by information management and opinion management, such as suggested in the previous section. The IT support can have many dimensions, such as:

- The fields of knowledge, which are important for the organization can be structured and administered by IT, particularly by databases. Even if databases do not provide knowledge as such (because of the missing consciousness) they can support access by people to the corresponding information.
- Such an information system can be extended by links to publications, to patent information systems, to

national and international statistics as well as to the accessible information systems of competitors.

- Maps of 'Who knows what?' can be organized, both, (i) internally, that is: 'Who in our own organization can help?' as well as (ii) externally: 'Who is an expert outside of our own organization?' Good IT support could help to search for strengths and weaknesses in an organization's own knowledge system in comparison to the competitors.

In general, it is simply a matter of allocation whether IT support for knowledge management is considered under the umbrella of knowledge management or that of information management.

IT support could also provide a service of the kind: 'This message might be of interest for you.' The only danger is that such an automatic system might provide many experts with too many messages and thus become counterproductive.

Another limitation for IT support is the maintenance effort. Even an internal information system of the type 'Who knows what?' is difficult and costly to maintain.

Concluding recommendations:

- He/she who studies knowledge management ought to try to get a deep familiarity with IT, particularly in the sense of IT support for knowledge management.
- He/she who is (or is going to become) a knowledge manager should try to design and implement an effective IT support for knowledge management.

However, IT support for knowledge management must not be understood as knowledge management itself.

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The following contributions by Heiner Müller-Merbach have been published in the series Philosophers and Knowledge Management in KMRP :

- (2004) Socrates' warning: knowledge is more than information. *Knowledge Management Research & Practice* 2(1), 61–62.
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