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On the metaphorical nature of intellectual capital: A textual analysis

ABSTRACT

Metaphors are at the basis of our understanding of reality. Using the theory of metaphor developed by Lakoff and Johnson (1980, 1999) this paper analyses common metaphors used in the intellectual capital and knowledge management literatures. An analysis of key works by Davenport & Prusak (2000), Nonaka & Takeuchi (1995), and Stewart (1991) suggests that at least 95 percent of all statements about either knowledge or intellectual capital are based on metaphors. The paper analyses the two metaphors that form the basis for the concept of intellectual capital: 'Knowledge as a Resource' and 'Knowledge as Capital', both of which derive their foundations from the industrial age. The paper goes into some of the implications of these findings for the theory and practice of intellectual capital. Common metaphors used in conceptualising abstract phenomena in traditional management practices unconsciously reinforce the established social order. The paper concludes by asking whether we need new metaphors to better understand the mechanisms of the knowledge economy, hence allowing us to potentially change some of the more negative structural features of contemporary society.

Introduction

According to Lakoff and Johnson (1980, 1999) we use metaphor to conceptualise phenomena, structure our thinking, and create abstract concepts. They state that a metaphor is not simply a matter of words that describe similarities, but metaphors are at the basis of most of our concepts and that abstract reasoning would be quite impossible without them. In this paper Lakoff and Johnson's framework is used to analyse the abstract concept of intellectual capital (IC) and to show that the IC concept is metaphorical.

First, a brief summary of Lakoff and Johnson's theory on metaphorical thought is given. Their framework is then utilized to analyse metaphors used to conceptualise knowledge. This is based on a textual analysis of the work of four leading authors: Davenport & Prusak (2000) and Nonaka & Takeuchi (1995). This shows that over 95 percent of their conceptualisation of knowledge is metaphorical. Having thus shown the importance of metaphor for our thinking about knowledge, the underlying metaphors of IC are analysed and tested, based on a textual analysis of the seminal article 'Brainpower' by Thomas Stewart (1991). The identification of the metaphorical nature of the IC concept leads to a number of implications and points for further discussion.

The conclusion that the IC concept is metaphorical is not judgemental. Metaphorical reasoning allows us to make sense of phenomena on an abstract level (the target domain) by using characteristics from a basic level (the source domain) and is, therefore, inescapable. Metaphorical reasoning is invaluable in creating new understanding and meaning; this analysis of IC as a metaphor, therefore, is not meant to be in any way derogatory.

How metaphor works

The unconscious at work

Metaphors provide a perspective on the world that helps to construct it in a certain way, emphasizing certain key characteristics and ignoring others. Lakoff and Johnson (1980, 1999) analysed the role of metaphor in human thinking. Their theory on metaphorical thought is based on three findings from cognitive science (Lakoff and Johnson, 1999):

- The mind is inherently embodied.
- Thought is mostly unconscious.
- Abstract concepts are largely metaphorical.

There has been an evolution of man's ability to reason. Higher order reasoning is built upon earlier basic reasoning concerning how our body works and on our primary experience of reality. Our brain and body, and especially our sensory motor system, shape our concepts. Those primary experiences of reality often have to do with space and movement, what Lakoff and Johnson term 'spatial relations'. As a result, spatial-relations concepts are at the heart of our conceptual system and we use them unconsciously. When we say that somebody stands in front of a tree, for example, we have unconsciously projected a front and a back on the tree; concepts that do not exist as entities in the external world. The use of words like being 'under', or 'on', reveal that we use spatial metaphors to conceptualise things. 'I am in love' makes sense because we unconsciously accept the underlying metaphor of LOVE AS A CONTAINER. Love is something you can be in, just like you can be in, up or under a container. The same counts for expressions like 'I am under pressure' or 'I am on to

something'. So we constantly use metaphor to conceptualise things and we are usually not aware of it.

Mapping

According to Lakoff and Johnson the use of these metaphors is not simply a question of pointing towards one specific similarity between the source domain of the metaphor (the container) and the target domain (love). Rather, it involves an elaborate mapping of elements from the source to the target domain. Take for example the concept of time. According to Lakoff and Johnson we cannot talk or think about time without using metaphor. One of these metaphors has to do with orientation, the TIME ORIENTATION metaphor, in which the following mapping takes place.

- The location of the Observer → the present
- This space in front of the Observer → the future
- The space behind the Observer → the past

This metaphor allows for expressions like 'it's all behind us', 'let's look ahead to the future', or, 'he has a great future in front of him'. If metaphor were simply about pointing towards one similarity between the source and the target then this consistent array of expressions would not be possible. In their thinking about time people combine the TIME ORIENTATION metaphor with two other metaphors: the MOVING TIME metaphor sees time as objects moving past an observer, which shows in expressions like 'time is passing by'; the MOVING OBSERVER metaphor for time becomes a path the observer moves over. This allows for statements such as 'will you be staying for a long time or a short time?'. The underlying metaphorical mapping of characteristics of the source domain 'space' (a path) on the target domain 'time' makes it possible to use spatial words (long, short) to describe the non-spatial concept of time. Another proof for the idea that mapping takes place is that we can immediately identify the meaning of novel metaphors like 'the deadline sneaked by me' or 'the days cascaded by'. These examples show that mapping can be both rich and complex.

Entailments

The metaphorical mapping from the source to the target domain can be rich and complex because metaphors have many call, 'entailments' (Lakoff and Johnson, 1999). Entailments are the connotations of the metaphor that transport meaning from the source to the target domain. The metaphorical entailments are characteristics of the source domain that, potentially, can be mapped onto the target domain. Using two examples 'the deadline sneaked by me' and 'the days cascaded by', Lakoff and Johnson (1999, p. 150) show how rich these entailments can be: "*Describing something as sneaking by you suggests that you don't notice it and that it is not your fault for not noticing it (...) something that cascades by you moves quickly, dazzlingly, and perhaps somewhat violently*". This is the power of metaphor; it can transport large amounts of meaning that is familiar to us from the source domain (people sneaking by, cascading objects) to an abstract concept (deadline, time).

Often not all entailments of metaphors are used. Lakoff and Johnson (1980, p. 52) give the example of the THEORIES ARE BUILDINGS metaphor. The parts of a building as a metaphor that are often used include the 'foundation' of the building ('the theory lacks a solid foundation') and the fact that a building can be constructed ('he constructed that theory'). However, other entailments are not used, for example the fact that buildings often have rooms, staircases, etc. On the other hand, they *could* be used to create novel expressions like: "*His theory has thousands of little rooms and long, winding corridors*" (1980, p. 53).

Although we tend to think of these expressions as being figurative, they make sense to us because they are based on the same THEORIES ARE BUILDINGS metaphor as the more common expression 'the foundation of the theory'.

The use of metaphors in thinking about knowledge

Metaphors to conceptualise knowledge

It is difficult, if not impossible, to try to think about knowledge without using metaphor. Common expressions about knowledge are based on metaphor as can be seen from the following examples.

- 'My knowledge is growing', 'Capturing knowledge' (KNOWLEDGE AS AN ORGANISM)
- 'Collecting, storing and sharing knowledge' (KNOWLEDGE AS A RESOURCE)
- 'Developing, distributing, and selling knowledge' (KNOWLEDGE AS A PRODUCT)

Knowledge is an abstract concept. It has no referent in the real world. We use metaphor to map elements of things we are familiar with in the real world (organisms, resources, products) onto the concept of knowledge to make it comprehensible. Knowledge is not a concept that has a clearly delineated structure. Whatever structure it has it gets through metaphor. To identify common metaphors for knowledge two classic chapters in the knowledge management literature were analysed. *The Knowledge-Creating Company* (Nonaka & Takeuchi, 1995) and *Working Knowledge* (Davenport & Prusak, 2000) are the two most cited publications in the knowledge management literature (Serenko and Bontis, 2003). Each book contains a similar chapter on the definition and characteristics of knowledge (Nonaka & Takeuchi, 1995, chapter 3; and Davenport & Prusak, 2000, chapter 1).

Methodology

Both chapters were analysed using the following textual analysis methodology:

- In the text, nouns related to knowledge were marked, such as *knowledge*, *knowledge assets*, and *knowledge company*.
- For each noun the related verb was identified, such as *create*, *store*, and *apply* (e.g. "to store knowledge").
- Each noun was checked to ascertain whether any attributes of knowledge are described, such as *flexibility*, *speed*, and *complexity* (e.g. "flexible knowledge").
- For each statement about knowledge found, the underlying metaphor was determined. Metaphors can often be found by looking at the literal meaning of the verb or adjective.
- Metaphors can also be subclasses of broader metaphors; for example, the KNOWLEDGE AS WATER metaphor is a subset of the KNOWLEDGE AS A SUBSTANCE METAPHOR. If this is the case, a verb or adjective was classified under the highest metaphor possible. For example, the statement "knowledge is a fluid" is classified under the KNOWLEDGE AS A SUBSTANCE metaphor and not under the KNOWLEDGE AS A WATER metaphor because there are more fluids than just water (see figure 1).

- After the identification of the metaphors used in *The Knowledge-Creating Company* the classification of the statements in *Working Knowledge* was revisited and vice-versa.
- The number of statements for each metaphor were counted and divided by the total number of statements found. It is assumed that this is an indication of the dominance of this metaphor in the conceptualisation of knowledge by the respective authors.
A total of 611 statements about knowledge were analysed.

Findings

Six types of metaphor

In the two book chapters 22 different metaphors used to conceptualise knowledge were found. However, several metaphors were subsets of broader metaphors as shown in Figure 1. Six types of metaphor were identified. These can be organized in different ways. In Figure 1 all metaphors are placed on a continuum from physical phenomena metaphors (KNOWLEDGE AS SOMETHING PHYSICAL) to abstract phenomena metaphors (KNOWLEDGE AS A STRUCTURE). Other continua to organize metaphors of knowledge are shown in figure 2. The six types of metaphors are described below.

TYPE 1. KNOWLEDGE AS SOMETHING PHYSICAL

This type of metaphor is used to conceptualise knowledge using entailments from the target domain of the physical world of substances such as land, objects and forms. Both Nonaka & Takeuchi (1995, p. 81) and Davenport & Prusak (2000, p. 5) talk about *making knowledge more fluid* and *knowledge is fluid* which is based on the KNOWLEDGE AS A SUBSTANCE metaphor. They state that knowledge has domains (KNOWLEDGE AS LAND), knowledge can be located, moved, and exchanged (KNOWLEDGE AS OBJECTS), and it can be converted and transformed (KNOWLEDGE AS A FORM).

Resources are a special case of objects, which can be stored, managed and shared. So the KNOWLEDGE AS A RESOURCE metaphor allows these authors to conceptualise knowledge as something that has the same traits as a resource. It is this metaphor that lies behind the concept of knowledge *assets* (Davenport & Prusak [2000, p. 5]) and knowledge *stocks* (Davenport & Prusak [2000, p. 6]). Another type 1 metaphor found in the texts is the KNOWLEDGE AS CAPITAL metaphor. Capital has most of the characteristics that other types of resources have and in addition it can be invested as well as valued, plus one expects a rate of return from capital. This metaphor is further analysed below, when we talk about intellectual capital.

TYPE 2. KNOWLEDGE AS A WAVE

Electricity, heat, light, and other waves have in common that they have a physical referent but cannot be seen or touched. They have certain characteristics that can be useful in conceptualising knowledge: waves can be generated, amplified, and diffused. This allows for expressions like “(...) *this new information technology (...) can not promote knowledge generation*” (Davenport & Prusak, 2000, p. 18), and “(...) *knowledge (...) must first be amplified within the organization.*” (Nonaka & Takeuchi, 1995, p. 84). It is interesting to note that in physics light itself is conceptualised using two rather different metaphors: light as a wave, and light as particles (Lakoff and Johnson, 1999). Because both conceptualisations are metaphorical they can be contradictory and at the same time true.

TYPE 3. KNOWLEDGE AS A LIVING ORGANISM

This metaphor highlights the abilities and active characteristics of knowledge. According to Davenport & Prusak (2000) knowledge *exists* (p. 5), *develops* (p. 7), and can *move* (p. 7). Nonaka & Takeuchi (1995, p. 60) state that “ (...) *much of our knowledge is the fruit of our own purposeful endeavours in dealing with the world*”. They also suggest that tacit and explicit knowledge *interact* (p. 57) and that knowledge can be *captured* (p. 63). Human beings are a special type of organism, capable of higher-order thinking. Davenport & Prusak (2000) use the metaphor of KNOWLEDGE AS A PERSON when they state that knowledge *works* (p.10), *judges* (p. 10), and *organizes* (p. 12). Nonaka & Takeuchi (1995) use the same metaphor when they talk about *socializing knowledge* (p. 64).

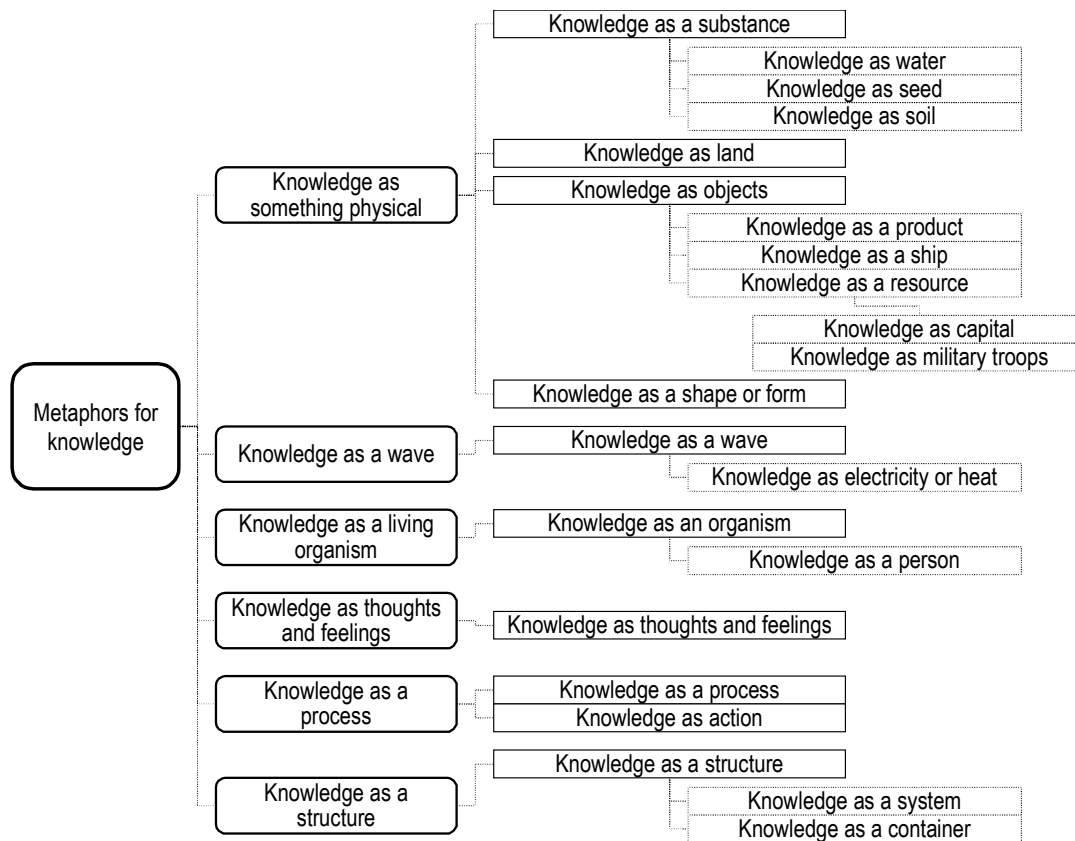


Figure 1: Typology of metaphors for knowledge found in Nonaka & Takeuchi (1995, pp. 56-94) and Davenport & Prusak (2000, pp. 1-24)

TYPE 4. KNOWLEDGE AS THOUGHTS AND FEELINGS

This group of metaphors is even less physical and touchable, yet very real. Our bodily experiences of feelings, ideas, and thoughts are used to conceptualise the intangible nature of knowledge. The classic distinction between tacit and explicit knowledge is based on this metaphor. Thoughts are inherently subjective and tacit, yet can be articulated, elicited, expressed, and communicated. According to Nonaka & Takeuchi (1995, p. 21) these characteristics also apply to knowledge. They state that in the Japanese culture there is a strong emphasis on the tacit nature of knowledge, which is different from the Western view. The emphasis on tacit knowledge is the result of the Japanese philosophical tradition, in

which the Cartesian split between subject and object has not been as deeply rooted as in Western philosophy.

TYPE 5. KNOWLEDGE AS A PROCESS

This metaphor emphasizes the dynamic nature of knowledge. The KNOWLEDGE AS A PROCESS metaphor is at the heart of Nonaka & Takeuchi's (1995) definition of knowledge. They define knowledge as "a dynamic human process of justifying personal belief toward the 'truth'." (p. 58). Davenport & Prusak (2000, p. 6) also adopt this metaphor when they state that knowledge can be seen as both a process and a stock, and when they talk about *knowledge enablers* (p. 18). This metaphor is especially interesting as neuroscience shows that thoughts are flows of chemicals in the brain and are, therefore, physically a process. Another type 5 metaphor found in the texts is the KNOWLEDGE AS ACTION metaphor, which also emphasizes the dynamic nature of knowledge. Nonaka & Takeuchi (1995) stress the fact that knowledge is about action and that it is always 'knowledge to some end' (p. 58). They also talk about the evaluation (p. 75) and justification of knowledge (p. 86), both of which are entailments of the KNOWLEDGE AS ACTION metaphor.

TYPE 6. KNOWLEDGE AS A STRUCTURE

This is the most abstract type of metaphor found in the texts. It is used to emphasize the fact that knowledge consists of elements that can be arranged in a particular form. This metaphor lies at the core of Davenport & Prusak's (2000, p. 5) definition: "(...) *knowledge provides a framework for evaluating and incorporating new experiences and information.*" According to Nonaka & Takeuchi (2000, p. 60) knowledge is also like a system as it has *cognitive elements*. According to Davenport & Prusak (2000, p. 5) knowledge has a certain structure that allows it to contain something, which is based on the KNOWLEDGE AS A CONTAINER metaphor.

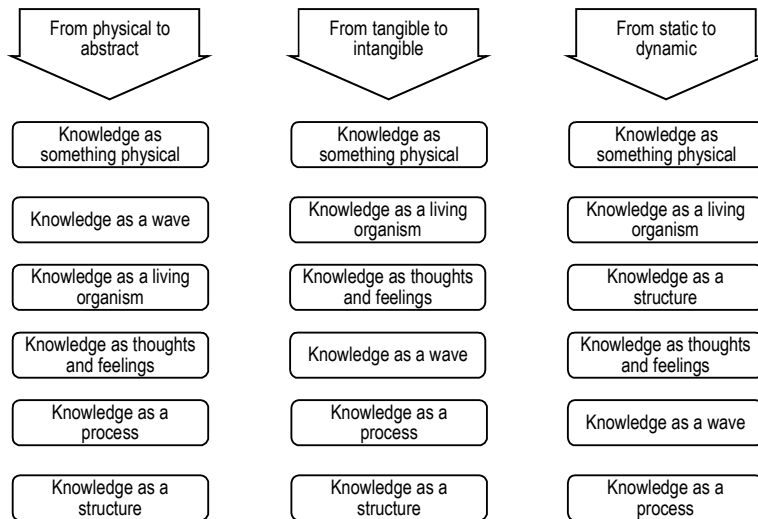


Figure 2 Different ways of organizing the typology of metaphors for knowledge

Differences between the authors

The differences in epistemology between Nonaka & Takeuchi (who are Japanese) and Davenport & Prusak (who are American) are reflected in their choice of metaphors to conceptualise knowledge, as can be seen in figure 3 and 4. The way Davenport & Prusak conceptualise knowledge is dominated by metaphors that have their target domains in the physical world. They especially use the KNOWLEDGE AS A RESOURCE metaphor (33 percent, a subset of KNOWLEDGE AS SOMETHING PHYSICAL). They predominantly view knowledge as a resource that can be created, stored, shared, applied, and managed.

This is in line with the tradition of Anglo-American analytic philosophy in which “*thoughts (knowledge, DA) have a public, objective existence independent of any thinker (...), thoughts correspond to things in the world (...), and thinking is seen as object manipulation* (Lakoff and Johnson, 1999, p. 248-49). Marr et al. (2003, p. 774) describe this ontology and epistemology as the cognitive perspective in which “*the world is seen as pre-given and representations of reality can be re-created and stored*”, just like a resource.

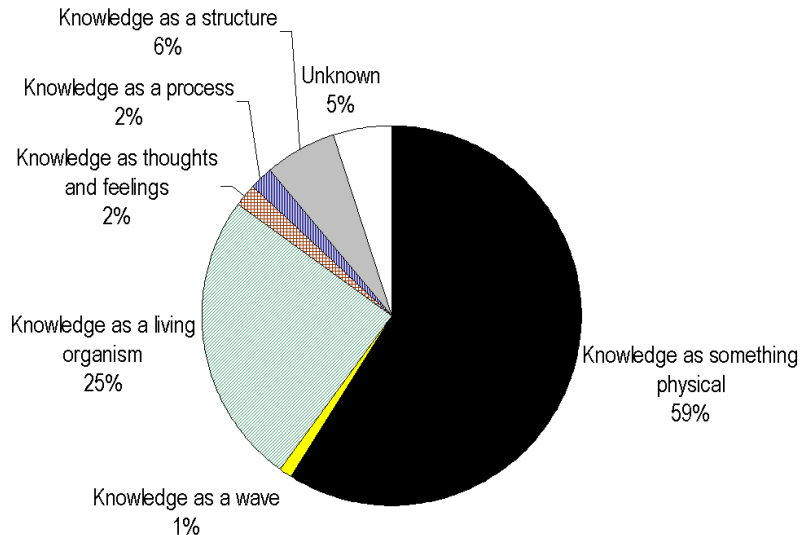


Figure 3 Distribution of metaphors used in chapter 1 of Davenport and Prusak (2000)

Nonaka & Takeuchi conceptualise knowledge predominantly as thoughts and feelings that are tacit but can be articulated. The big share of this metaphor in figure 4 is partly due to their intensive use of the terms 'tacit knowledge' (69 times) and 'explicit knowledge' (42 times), which are both based on the KNOWLEDGE AS THOUGHTS AND FEELINGS metaphor. This metaphor corresponds with Nonaka & Takeuchi's strong emphasis on knowledge as a *human process*.

This is in line with the autopoietic (Marr et al., 2003) or constructionist view on knowledge in which knowledge is seen as socially constructed and therefore objective observation is impossible. According to Marr et al. (2003, p. 774) “*This view conforms with the Japanese intellectual tradition where knowledge involves emotions, values and hunches and is not viewed simply as data or information that can be stored*”.

Yet, despite the fact that Nonaka & Takeuchi define knowledge as a *process* and primarily conceptualise it based on the KNOWLEDGE AS THOUGHTS AND FEELINGS metaphor, they also use entailments from metaphors about physical things in 29 percent of their statements when they suggest that knowledge can be transferred, sorted, leveraged and passed on. This shows that in their text Nonaka & Takeuchi want to highlight characteristics of knowledge that do not match their formal definition of knowledge. Their formal definition is in a certain way too restrictive and does not reflect all the characteristics of knowledge that the authors consider relevant. It also shows that Nonaka & Takeuchi's epistemological view on knowledge is not purely relativistic because the entailments of the KNOWLEDGE AS SOMETHING PHYSICAL metaphor are inconsistent with relativism. If knowledge is a personal conceptualisation of reality that cannot exist independent of the observer, then it cannot be transferred or passed on like something physical.

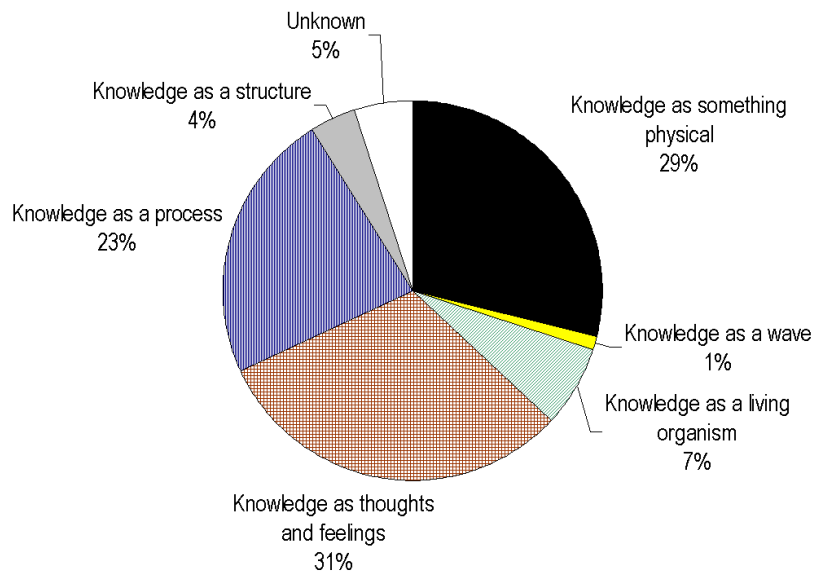


Figure 4 Distribution of metaphors used in chapter 3 of Nonaka & Takeuchi (1995)

The dominance of metaphorical thought

Thinking about knowledge requires metaphors. Knowledge has no referent in the real world and requires metaphor to be defined, conceptualised, and acted upon. In 95 percent of their statements about knowledge, Davenport & Prusak and Nonaka & Takeuchi use some kind of metaphor. Thirty-one statements (5 percent) could not be linked to a metaphor. They were either non-metaphorical or not specific enough. The findings here highlight the dominance of metaphorical thought in thinking about knowledge and it is further confirmed by the analysis of a text from Stewart (1991) described below.

The metaphorical nature of intellectual capital

The two or three metaphors of intellectual capital

The concept of intellectual capital (IC) has turned out to be appealing to both practitioners and academics. Hudson (1993) quotes the economist Galbraith as the first to use the term *intellectual capital* as early as 1969. Stewart (2001) claims that it dates back at least to 1958 with Marr (2005) suggesting that it goes even further back to 1836 when the economist Nassau William Snr. used it. The first appearance in the popular press of the term *intellectual capital* was in an article by Stewart (1991) in *Fortune* called "Brainpower." Today the Intellectual Capital Community consist of thousands of academics from all over the world while many companies experiment with internal intellectual capital measurement systems and external intellectual capital statements.

Using the mapping theory of Lakoff and Johnson we can analyse IC as a complex metaphor containing two, maybe even three separate metaphors. The first two metaphors are expressed by the word 'capital' which provides the perspective of the resource-based view of organizations and emphasizes the accumulation of knowledge. Capital refers to two metaphors that we already met above: KNOWLEDGE AS A RESOURCE and KNOWLEDGE AS CAPITAL. The third metaphor may be expressed by the word 'intellectual'. The combination of this word in conjunction with the word 'capital' can be seen as a use of the CAPITAL AS AN ORGANISM metaphor. However, as we will see below, this seems to be problematic.

Knowledge as a resource

The concept of IC refers to the resources of a company and it is based on the idea that we can view organizations as entities in which various types of resources are transformed to create value. This is, to a certain extent, literally true in a factory where raw material is transformed into products. However, the concept of IC uses this process metaphorically to indicate that non-material phenomena like knowledge are also important 'resources' and that they are used in a transformation process.

The KNOWLEDGE AS A RESOURCE metaphor underlying the concept of IC reveals the first root of the IC concept: the resource-based view. The resource-based view of the firm (Penrose, 1959; Wernerfelt, 1995) suggests that a firm is best viewed as a collection of sticky and difficult-to-imitate resources and capabilities (Bontis, 2002). The more specific 'knowledge-based view' of the firm focuses upon knowledge as the most strategically important of the firm's resources (Grant, 1996).

As human beings we are familiar with the concept of resources. From the beginning of mankind we have found, stored and used resources. It is therefore common to conceptualise something using the metaphor of a resource. Lakoff and Johnson (1999) provide the example of the TIME AS A RESOURCE metaphor. This metaphor underlies phrases like 'wasting time', 'saving time', 'spending time efficiently', etc. Likewise we can say that IC can be saved, spent, and wasted.

Knowledge as capital

The concept of intellectual capital is based on the metaphor of KNOWLEDGE AS A RESOURCE, but it is also more specific as it explicitly conceptualises knowledge as capital. Capital is a particular type of resource that has special characteristics. The word capital is derived directly from the Latin 'capitale', with the adjective corresponding to the noun caput,

meaning 'head'. It originally referred to the head part of a debt, as distinguished from the interest. Over the centuries, the meaning of the word broadened until not only interest-bearing sums of money were considered capital, but all sorts of other collections of wealth were considered capital, provided only that it was possible to link them as the embodiment of interest-bearing sums of money—that is to say, as “money at work” (Von Böhm-Bawerk, 1959).

The KNOWLEDGE AS CAPITAL metaphor has almost all the entailments of the KNOWLEDGE AS A RESOURCE metaphor and adds some of its own as well:

- Capital is valuable and important;
- Having more capital is better;
- Capital can be owned;
- Capital can be valued financially;
- Capital often appears on the balance sheet.
- Capital is additive ($1+1=2$);
- Capital is a stock;
- Capital can and must be measured and managed;
- Capital can be invested in;
- Capital itself can be invested;
- Capital can be capitalized;
- Capital allows for a return.

All of these entailments of the KNOWLEDGE AS CAPITAL metaphor appear with the concept of intellectual capital. A large part of intellectual capital literature deals with these aspects of IC (Marr, 2005). All of these entailments of the KNOWLEDGE AS CAPITAL metaphor have a positive connotation in the business community, which shows that intellectual capital is a rich and 'positive' concept.

Capital as an organism

Let us now turn our attention to the word 'intellectual'. An important question we should ask is whether the term 'intellectual' is also metaphorical. Is the term used in the sense that the 'capital' is in fact 'intelligent' or 'smart'? If this is the case then the underlying metaphor is CAPITAL AS AN ORGANISM. Organisms are the only phenomena that can possess attributes like intelligence and intellectualism. CAPITAL AS AN ORGANISM is not an uncommon metaphor, as we also use concepts like 'growing capital', 'dead capital', 'seed capital', and 'working capital', which are based on the entailments of the same CAPITAL AS AN ORGANISM metaphor. This line of reasoning would be consistent with other types of capital, differentiated by adjectives, for example 'financial capital' and 'human capital'.

However, one could also argue that the 'intellectual' part of IC is not really a metaphor because it does not describe an attribute of capital but instead describes where this capital originates (from the intellectual activities of human beings). The term would then simply state that we are talking about capital that is created by people using their intellect. This would be more in line with two other concepts that are often used in conjunction with intellectual capital: structural capital (capital that results from the structure of the organisation), and relational capital (capital that results from the relationships of the organization with the environment). This argument could also be made consistent with the terms 'financial capital'

and 'human capital' if we say that 'financial' means resulting from money and 'human' means resulting from human beings.

This latter view also seems to be more in line with the idea promoted by many authors (Roos et al. [1997], Edvinsson and Malone [1997], Bontis [2001]) that intellectual capital is more than knowledge. Intellectual capital includes human capital, structural capital, and relational capital. We can say that each of these categories of capital result from the intellectual activities of human beings, providing that we do not limit the meaning of the term 'intellectual' to left-side-of-the-brain (logical-mathematical) capabilities but instead adopt a wider view and include linguistic, musical, spatial, bodily-kinesthetic, intra-personal and inter-personal intelligences (Gardner, 1993). This leads to the idea that the word 'intellectual' refers to the origins of the capital and is not a metaphor and to the, albeit tentative, conclusion that the concept of intellectual capital is based on two (and not three) metaphors: KNOWLEDGE AS A RESOURCE and KNOWLEDGE AS CAPITAL.

Empirical evidence

Theoretically, the concept of IC is now viewed here as based on two metaphors: KNOWLEDGE AS A RESOURCE and KNOWLEDGE AS CAPITAL. This was tested by analysing Tom Stewart's famous article 'Brainpower' published in 1991. This article is known as the first popular article in which the term 'intellectual capital' was used (Bontis, 2002). The purpose of the analysis was to test whether KNOWLEDGE AS A RESOURCE and KNOWLEDGE AS CAPITAL were the dominant metaphors used in the article to conceptualise intellectual capital.

Figure 5 shows the share of each metaphor in the total number of 60 statements analysed. The KNOWLEDGE AS A RESOURCE and KNOWLEDGE AS CAPITAL metaphors are the two most dominant of the 13 metaphors used in the article. Together these metaphors cover 45 percent of all knowledge-related statements. This shows that entailments of those two metaphors are at the heart of Stewart's intellectual capital argument, which supports the theory that IC is based on KNOWLEDGE AS A RESOURCE and KNOWLEDGE AS CAPITAL metaphors.

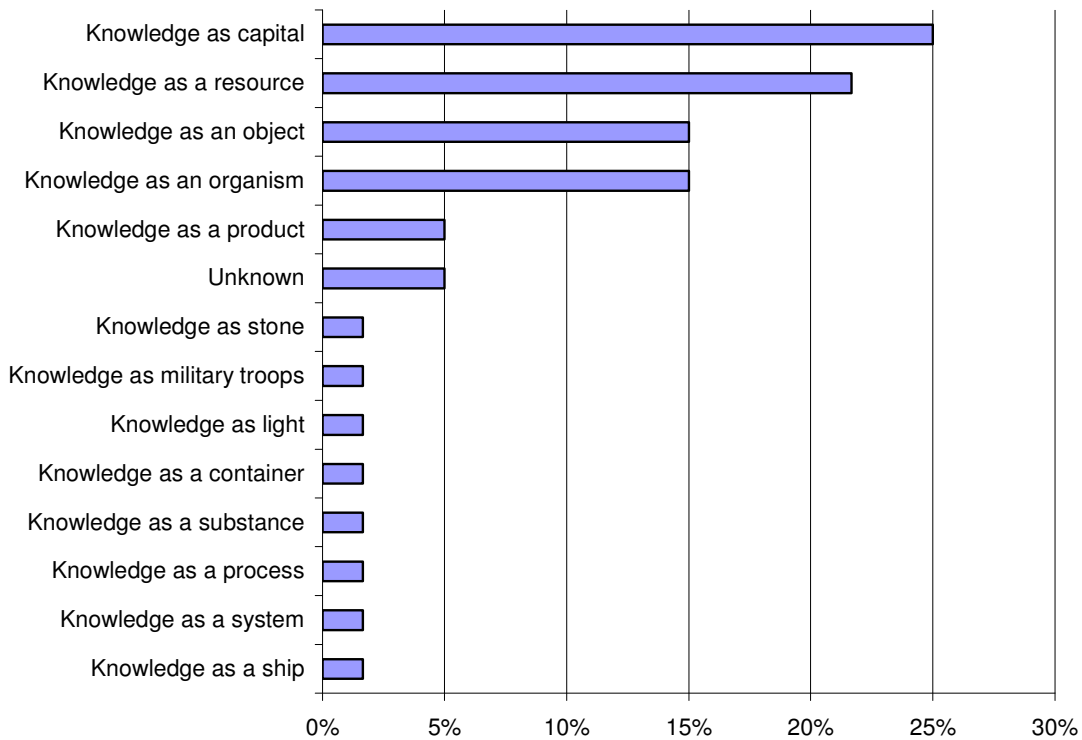


Figure 5 Distribution of metaphors used in Stewart (1991)

KNOWLEDGE AS AN OBJECT and KNOWLEDGE AS A PRODUCT are at the basis of another 20 percent of all statements. When we categorize all 13 metaphors according to the 6 types of metaphors described above we see that metaphors related to physical concepts, including resources, capital, objects, and products lie behind 73 percent of the knowledge-related statements in the article (see figure 6). This is far more than found in Davenport & Prusak (59 percent) and Nonaka & Takeuchi (29 percent). It strongly suggests that Stewart primarily conceptualises intellectual capital as something that can be found, owned, stored, shared, measured, managed, and applied.

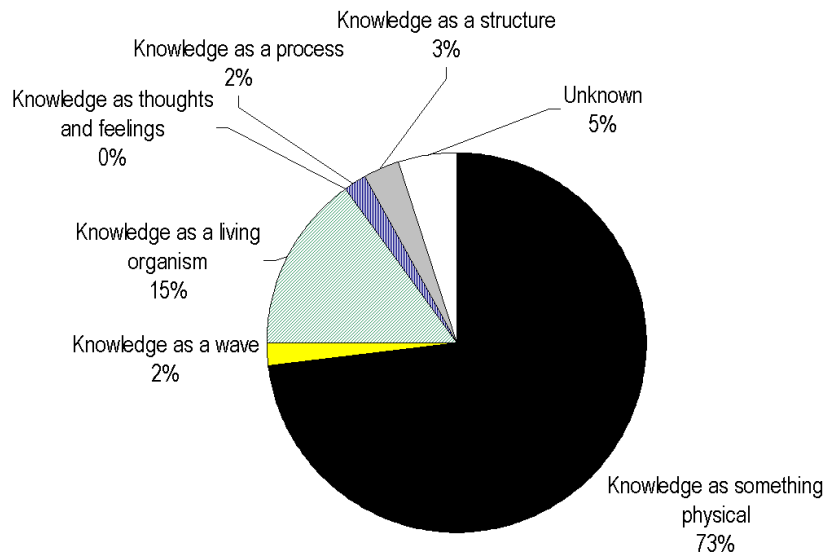


Figure 6 Distribution of classes of metaphors used in Stewart (1991)

Conclusions, implications and discussion

Conclusions

Knowledge is an abstract concept; it has no referent in the real world. We use metaphor to map elements of things we are familiar with in the real world onto the concept of knowledge to make it comprehensible. Knowledge is not a concept that has a clearly delineated structure; whatever structure it has it gets through metaphor. In the publications analysed in this paper 95 percent of the statements about knowledge are metaphorical. The concept of intellectual capital is also metaphorical by its very nature and I have argued that it is based upon the KNOWLEDGE AS A RESOURCE and KNOWLEDGE AS CAPITAL metaphor.

The KNOWLEDGE AS A RESOURCE and KNOWLEDGE AS CAPITAL metaphors are rich in entailments such as; capital is important, more capital is better, and capital needs to be measured and managed. The richness of the KNOWLEDGE AS A RESOURCE and KNOWLEDGE AS CAPITAL metaphors allow for a new and multidisciplinary view on organizations. The word 'capital' resonates with chief financial officers, CEOs, and other members of the financial community. Through its metaphorical nature the term intellectual capital has added to the proliferation and acceptance of the idea that knowledge is important and needs to be carefully looked at in business.

Implications

People using metaphorical conceptualisations of knowledge should be aware of the limitations of these metaphors and avoid taking the conceptualisations literally. Metaphors steer us in a certain direction and this may happen unconsciously. This happens for example if we were to take the KNOWLEDGE AS CAPITAL metaphor literally. In the source domain,

capital has certain characteristics (it is important, more is better, it can be owned, it can be financially valued, it appears on the balance sheet, it is additive, it is a stock, it needs to be measured and managed). If we literally transfer these characteristics to the target domain (knowledge), we assume that these characteristics automatically apply to knowledge. As a result we may pay no attention to the development of a proper argumentation for valuing knowledge or for somehow putting it onto the balance sheet.

Andriessen (2004, p.85) concludes that many methods for measuring IC suffer from "jumping to conclusions". They lack a proper problem definition and argumentation justifying the need for IC measurement. Based on this study of IC as a metaphor this lack of argumentation can be explained by authors taking their metaphors too literally. If we use the term intellectual capital we suggest that KNOWLEDGE IS CAPITAL, and assume that it is clear why it needs to be measured and managed. Therefore, scholars should reflect on their (often unconscious) use of metaphors in conceptualising knowledge.

Metaphors highlight certain characteristics and ignore others, so the IC community should ask itself what characteristics of knowledge the KNOWLEDGE AS CAPITAL metaphor ignores. For example, it ignores the fact that knowledge is subjective and difficult to elicit which is highlighted by the KNOWLEDGE AS THOUGHTS AND FEELINGS metaphor. It also ignores the dynamic characteristics of knowledge as highlighted by the KNOWLEDGE AS A PROCESS metaphor.

Understanding organizations starts with conceptualisation and improving organisations is based on understanding. The way we conceptualise knowledge will steer the way we think about improving knowledge in organizations. The types of metaphors that we choose to conceptualise knowledge drive our ideas about how knowledge can be acted upon. When metaphors like KNOWLEDGE AS AN OBJECT and KNOWLEDGE AS A RESOURCE are the dominant metaphors in how we think about knowledge, we will be more inclined to try to store, distribute, and manage knowledge. When our thinking about knowledge is dominated by the KNOWLEDGE AS THOUGHTS AND FEELINGS metaphor we will be more sceptical about this codification strategy and will probably have more faith in a personification strategy (Hanson, M.T., et al., 1999). It follows that any analysis of metaphors used to conceptualise knowledge is not only relevant for scholars but also for managers and knowledge workers. Choosing the wrong metaphor may result in a less useful diagnosis and a solution that fails. Therefore, the topic of metaphors to conceptualise knowledge is also important for management education. Students need to learn to play with different metaphors, reflect on the implications of using a particular metaphor, and to choose the best metaphor in a particular situation.

Discussion

The textual analysis methodology presented in this paper can be improved in a number of ways. More research needs to be done on refining the identification and classification of metaphors because some statements about knowledge can be classified under several metaphors and it is to some extent arbitrary which category is the best. Some statements may not be truly metaphorical but based on metonym or proverbs. It could also be that crudely counting statements is not the best way to identify the dominant metaphors in the thinking of authors. In addition, it could be that problems of translation influence the identification and classification of statements by a non-native speaker such as the author of this article. Another issue that must be looked into is the possibility that authors use a selection of different metaphorical expressions not to convey different conceptualisations of knowledge, but to make the text more readable.

Further research can be done on the correlation between the metaphors used by authors and their epistemological premises in order to answer such questions as - whether

cognitivists use different metaphors to conceptualise knowledge than constructionists. Major differences in opinion regarding the nature of knowledge are probably a result of the use of different metaphors in conceptualising knowledge. This brings us to the basic question of whether the metaphors we use to conceptualise knowledge are the cause or the effect of the way we think about knowledge. According to Lakoff and Johnson (1999) most of our thought is unconscious and metaphorical, which suggests that metaphors are leading in the way we view the world. Lakoff and Johnson's analysis of the way we conceptualise time described above provides compelling evidence for this. If metaphors unconsciously lead the way we think about knowledge then textual analysis of metaphors in-use can reveal an author's 'unconscious' epistemological viewpoint (theory-in-use), which might be different from his or her formal viewpoint (espoused theory).

There is also the issue of language. *The Knowledge-Creating Company* was not written in the native language of the authors. Do translation difficulties influence the choice of metaphors for knowledge? And what is the influence of culture? Lakoff and Johnson (1999) show that different cultures use different metaphors to conceptualise even basic concepts like time and cause and effect. This must also be true for the conceptualisation of knowledge. Texts of more authors can be analysed and the relationship between their metaphors and their cultural background would be an interesting topic to explore. It would also be interesting to analyse older and newer texts from the same author to see whether his or her conceptualisation and understanding of knowledge has changed.

Other authors need to be analysed to find even more metaphors for knowledge. Most of the metaphors found in this paper appear to be 'physical'. Further research could reveal that there are metaphors that are more 'metaphysical'. Then the question becomes relevant whether all these metaphors are necessary and whether even with the large number used they may still be inadequate to describe knowledge. What if we had a small set of truly beautiful and useful metaphors for 'knowledge', could we be more critical of all the others, showing their shortcomings where they exist?

Research can be done on the relationship between the metaphors authors use for knowledge and their ideas on managing knowledge. What are useful conceptualisations of knowledge to diagnose and improve the performance of organizations and which conceptualisations are not so helpful?

Looking at the metaphorical background of the conceptualisations of knowledge and intellectual capital opens up an exciting new field of management research. It can have profound implications for how we think about knowledge. It can make us aware of the fact that we use metaphors all the time to help us create new understanding, but also that we can make mistakes if we take them too literally.

Research into the metaphorical nature of concepts is rather new in the field of knowledge management and intellectual capital research. Yet, it is an important type of research because most of our thought is metaphorical, which means that metaphors are leading in the way we view the world. The leading role of metaphors suggests that we should explore metaphors more, as they are our key means to create understanding of a fast changing world. The source domains of both the KNOWLEDGE AS A RESOURCE and KNOWLEDGE AS CAPITAL metaphor stem from the industrial age. This raises an important question, namely do we need to develop new metaphors in order to conceptualise knowledge better?

As metaphors also have political relevance (Lakoff, 2002) the question becomes: do we need new metaphors to better understand the mechanisms of the knowledge economy, hence allowing us to potentially change some of the more negative structural features of contemporary society? The economic system in which enterprises operate is a social construction based on a particular set of metaphors. This capitalistic economic system is based on the resource metaphor and the metaphor of transformation of input into outputs.

The system generates rules that every company needs to apply; rules that are inescapable for any company that wants to be successful. Therefore, the metaphor of knowledge as a resource seems inescapable. Yet, if we want to change the system, we may have to start at the bottom and change the metaphors that shape the way we conceptualise the world.

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