

Pragmatic Semiotics and Knowledge Organization

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ABSTRACT: The present paper presents a philosophical approach to knowledge organization, proposing the pragmatic doctrine of C.S. Peirce as basic analytical framework for knowledge domains. The theoretical framework discussed is related to the qualitative branch of knowledge organization theory i.e. within scope of Hjørland's domain analytical view (Hjørland and Albrechtsen 1995; Hjørland 2002; Hjørland 2004), and promote a general framework for analyzing domain knowledge and concepts. However, the concept of knowledge organization can be viewed in at least two perspectives, one that defines knowledge organization as an activity performed by a human actor e.g. an information specialist, and secondly a view that has the perspective of the inherent self-organizing structure of a knowledge domain the latter being investigated in the paper.



Omne Symbolum de Symbolo

Introduction

A concept like *counterpoint* communicates far more structured and specialized knowledge to an organist than to a physiotherapist who, on the other hand, receives far more structured and specialized knowledge from the concept of *electric therapy* than an organist. A librarian receives far more structured knowledge from the concept of *LIS* than an occupational therapist who, on the other hand, receives much more structured and specialized knowledge from the concept of *activity* than a librarian and so on.

These observations are so trivial that most people will agree with them and simply not ascribe them any significance. However, there is a lot of hidden infor-

mation within these observations. It seems to us that these observations force us away from the idea of a universal language, towards a socio-contingent and pragmatic approach to KOS¹ development and thus denominate knowledge organizations with the perspectives, goals and interests of a given knowledge domain. In this case the structure and meaning of concepts seems to be relative to discourse communities.

This paper proposes a theoretical framework, which is based in what we name socio-pragmatic epistemology, a view that is rooted in C.S. Peirce pragmatic realism. We argue that knowledge and knowledge domains are based in social epistemology that constrains the symbolization of scientific con-

cepts, however we also argue that science progresses in the direction of certainty, hence concepts are not merely arbitrary social constructions, motivated by individual or local social values and motivations, but rather motivated by scientific inquiry that gradually produces theories, concepts and models of reality with greater accuracy thus implying realism.

“... few thinkers familiar with the history of science would deny that scientific terms change their meanings through changes in scientific theory. What is controversial is only whether such changes are progressive or arbitrary. This does not make Peirce’s position equivalent to Kuhn’s; Peirce held that scientific terms grow more precise through the progress of knowledge, hence their changes of meaning have a definite direction, that of greater precision. By maintaining, for instance, that the term ‘mass’ in Einsteinian physics is incommensurable in meaning with the term ‘mass’ in Newtonian physics, Kuhn appears to deny that meanings change in the direction of increased precision, and his conclusion seems to be that the meanings of scientific terms change in an essentially arbitrary manner which can be ascertained only by historical research”. (Skagestad 1981 p. 127)

Furthermore as indicated above the meaning communicated by concepts is relative to domains of knowledge, which explains why certain concepts apparently can exist in different knowledge domains, but with different influential value and meaning.

Consequently, the interpretation of scientific concepts depends on the interpreters pre-understanding. The potential knowledge of a concept is related to human interpretation and thus tied to actuality, intentionality and directedness. However, not every interpretation is possible. Even though the individual are governed by subjective goals and needs, the interpretation of scientific concepts is delimited and contextualized by social reality. Concepts reflect the knowledge of the particular discourse community and not the individual scientists. Therefore concepts should reflect intra-disciplinary consensus that constrains the potential knowledge revealed by the concept and ultimately confine the perception of concepts to a general understanding and definition within the knowledge domain.

Based on these assumptions and their consequences, we propose a theoretical framework for knowledge organization based on a pragmatic and

semiotic sociology of knowledge, which we describe as the socio-pragmatic view and which we believe is more apt to handle the historical and evolutionary dimension of information and knowledge development, simply because the socio-pragmatic view acknowledge the dynamics of knowledge production, communication and social interaction as prerequisite for any scientific development.

From semiotics we learn that knowledge is the result of a continuous interaction of sign processes; processes, which ultimately presuppose that signs communicate meaning. The meaning of concepts are investigated and identified by human intelligible activity purposefully produced as means for grasping reality. Concepts are ideational vehicles for meaning communication fixated by means of language. Linguistic expressions relate to concepts, but may be seen as the counterpart of concepts because concepts are abstract ideational entities and language is the concrete manifestation of conceptual meaning.

On the basis of our discussion, we are able to characterize and define our conception of knowledge:

- Knowledge results from communicative processes of sharing of knowledge within a knowledge domain.
- Knowledge creates stable interpretive structures – habits upon which communicative processes can rest and develop.
- Knowledge is contained in the concepts of a knowledge domain and it can be identified in the relation of concepts to other concepts within the knowledge domain, simply because a relation can be understood as a manifestation of the meaning of a concept see (Thellefsen and Jantzen 2003, 109-132).
- The one way to identify the conceptual structure of a knowledge domain is through its expressions that are communicated by linguistic signs, which attain their meaning in their relation to the concept.

If concepts communicate meaning relatively to the knowledge domain they stem from, and they create the knowledge structure of the knowledge domain, then it should be possible to set up general criteria explaining how knowledge can be identified and organized. The knowledge domain has an impact on these criteria, since it places interpretive constraints on its concepts. We argue that it is the telos containing the ideal and values of a given knowledge domain

that organizes the knowledge in a knowledge domain and make the organization unique to the knowledge domain.

1. Knowledge and Knowledge Domains

In the following section, we shall discuss the concept of knowledge and the concept of knowledge domains or discourse communities. Our point of departure is a general discussion of the conceptualization of knowledge within social organizations, where knowledge can be seen as a complex system of interrelated socio-cognitive structures of signs, which communicate meaning within a social context. Then what is knowledge? In the natural sciences, knowledge is associated with truth and objectivity. The humanities tend to have a more differentiated and somewhat more relative view of knowledge. Here, knowledge is discussed within different epistemological frameworks, and is viewed as the result of cognitive and cultural processes, which enable an individual to act within his or her personal world. Here, personal experience and abilities are central issues when it comes to having knowledge about something. The social sciences differ from the natural sciences and the humanities in viewing knowledge from a social point of view. This means that knowledge per se is not tied to the objective natural world or to the individual but is the result of social processes. Consequently, knowledge is tied to a discourse formed by social processes, and not to the individual. It is important to point out that the different forms and contents of knowledge occurring as a result of social processes within a given discourse cannot be transferred from one discourse to another. This is why the formal logic of the natural sciences is less successful when applied to the social sciences and the humanities; the epistemological foundations are different and the objects discovered are different; the knowledge structure and knowledge understanding contained in concepts within the three meta discourses have fundamental inherent differences. This is why it is necessary to point out the circumstances in which knowledge and concepts are being used. We must clarify our definition of knowledge to avoid misunderstandings. We argue that the different conceptions of knowledge, as roughly sketched above, alone are unable to define and characterize knowledge. As a starting point, we argue that we must combine the definitions. We also stress the social and communicative aspect of knowledge. We argue against an objective understanding of knowledge because we believe that

knowledge is created within contexts and indeed, it creates contexts. This argument is supported by contemporary studies in linguistics (Lakoff 1987; Rosch 1987; Lakoff and Johnson 1999), within social discourse theory (Berger and Luckmann 1967; Kuhn 1974; Fairclough 1992) and within contemporary studies in terminology (Temmerman 1997; Cabré 1999; Temmerman 2000).

However our understanding of knowledge is based upon a realism that anchors our knowledge of our surroundings in the objective existence of the world. Consequently, we do not accept a radical humanistic idea of knowledge, since we believe that knowledge per se is not dependent upon an interpreting individual. Of course, an individual interprets knowledge but the interpretation is based in a context that in this case is the discourse of the knowledge domain. Our concept of knowledge is interdisciplinary and is based upon Peirce's pragmatic doctrine, in which knowledge appears through sign processes. Semiotics denotes a process where the sign when interpreted, determines a new sign containing aspects of the original sign. As an example, one can imagine the concept of *counterpoint*: The interpretation of the sign creates another sign relative to *counterpoint* in terms of a related concept e.g. *fugue*. It is equally important to understand that the interpretation of *counterpoint* is maintained within the knowledge domain from which the concept stems. The knowledge domain puts constraints upon the concept compelling a certain interpretation; furthermore, the concept, *counterpoint*, puts constraints upon the related concept, *fugue*. This means that the self-understanding within the knowledge domain grows and is strengthened by this reinforcing process – simply by the interpretations of concepts. It is this complex of signs we call a knowledge domain.²

2. Knowledge Domains

Then, what does this mean when it comes to the definition of a knowledge domain? A knowledge domain is to be understood as a demarcation of given knowledge, whether anchored in a professional or non-professional context. The knowledge domain is well defined by a kind of meaningfulness, which organizes knowledge in relation to a particular object field or a certain perspective. Thus, knowledge is dependent upon a viewpoint that creates contextual frames and defines the meaning potential in a given communication.

A knowledge domain is not necessarily tied to a profession. It can also be related to daily activities. A given discourse activates a meaning potential, which in this case is labeled a knowledge domain and in which a given activity unfolds.

In spite of the breadth of this definition, we choose to work with knowledge domains with an identifiable terminology that is, a knowledge structure which organizes and maintains the knowledge content and which has a proper character, distinguishing it from other knowledge domains. In our general definition and understanding of knowledge domains, we do not distinguish scientific knowledge from other professional knowledge.

Summing up, a knowledge domain rests upon its conceptual structure, its terminology and the propriety of the terminology, which reflects fundamental concepts that make any knowledge domain different from others; Occupational Therapy is different from Physiotherapy, Library Science is different from Human Computer Science, Cognitive Semantics is different from Data Engineering etc. The difference is defined by the independent objectives and politics, which affect the terminology. Thus, we argue that the peculiarities of the knowledge domains have to be identifiable through the conceptual structure, which is created and maintained by the terminology. This gives us the following hypothesis:

A knowledge domain is organized by its concepts and the meaning of the concepts is anchored in the activity that is tied to the goals of the knowledge domain.

Based on this hypothesis we suggest that by identifying and analyzing the explicit concepts – linguistic expressions – and their relations, we are able to identify the structure of the knowledge domain and in that structure we are able to find the essence of the knowledge domain. However, the hypothesis requires that we look closer at our pragmatic conception of concepts and signs.

3. Concepts as Signs

We understand concepts as signs in the pragmatic semiotic tradition. This allows us to maintain that the vast content of tacit knowledge within a knowledge domain expresses stable patterns of meaning, which exactly is the result of sign processes. These sign processes have subsequently become habits of interpretations. This further means that concepts contain

a knowledge potential, which becomes actualized when concepts are interpreted. See figure 1 below.

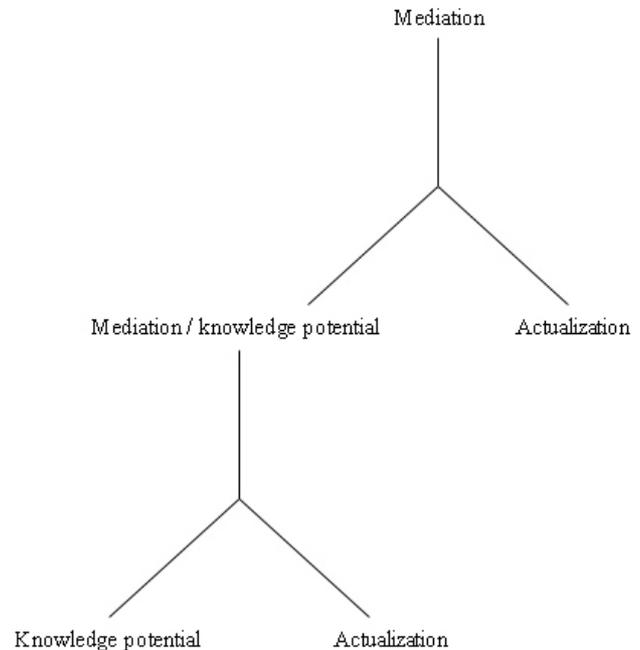


Figure 1. According to the triadic sign defined by Peirce, the knowledge potential of the concept is placed on the place of the representamen; it designates all possible interpretations that the knowledge domain allows the potential to contain. According to our understanding of knowledge, the interpretation of signs within a social context is not solely dependent on the individual interpreter but is anchored within the social context. One cannot interpret signs according to subjective whims or preferences. The knowledge domain puts constraints upon our interpretations. The manifestation of the knowledge potential is placed in the place of the object, and is the actualization of the knowledge potential of the concept. The mediation, that is the interpretive habit that enables us to understand the meaning of the concept, is placed on the place of the interpretant and the interpretive habit creates a new potential which contains aspects of both the latter knowledge potential and the actualization of this. Figure one depicts the ideal sign process of a concept.

In relation to our knowledge of a concept the interesting aspect of the sign process is, that knowledge, as a sign process constitutes a potential that has been actualized through a certain interpretation and again becomes a potential but displaced from the first potential.

This means that knowledge as a starting point has undergone a semiosis – a sign process, where the sign develops from potentiality to actuality and back to potentiality again maintained through the interpretive

habits of the knowledge domain. This is how tacit knowledge or in Peirce's words collateral knowledge is possible; it exists latently as a potential but is brought into action (actualized) when an action, either mental or physical is performed; and since every action in some way contains an intentionality, an action will always be performed in relation to a habit, which is similar to the mediation in figure 1.

This is why we also understand tacit knowledge as semiotic structures, which as a result of the evolution of the knowledge domain, have become habits and furthermore have become identical with the knowledge potential of the knowledge domain. However, we stress that the actualization of the knowledge potential of a concept not necessarily means that tacit knowledge becomes spoken language however; it is prerequisite to spoken language. When performing an act both physical and psychological, which is based in tacit knowledge of the knowledge domain, this act is an actualization of a knowledge potential maintained through a habit of interpretation. Peirce used a similar concept: collateral experience, which means that in order to interpret a sign one has to have "*previous acquaintance with what the sign denotes*". (CP 8.179)³

What we try to make probable is that the knowledge of a knowledge domain is contained in the mutual relations of the concepts. Thereby the concepts get a knowledge organizational role in the knowledge domain due to their semiotic potential, and this role can be seen in the many different concept relations. An occupational therapist will always interpret a new concept in proportion to the knowledge she already has. A new concept developed within learning theory will become fixed within OT and through the already existing concept relations; it will be maintained in an occupational therapeutic understanding. In this way any new concept will be adjusted to fit the already existing knowledge structures. By this process, concepts become self-organizing i.e. a self-organizational ability, which however is anchored in the knowledge domain's understanding and fixation of the subject field. This intrinsic understanding of the subject field is created on the background of a common and general idea, which again creates the basis for the development of the fundamental sign of the knowledge domain, which by its fundamental nature organizes the major part of the knowledge in the knowledge domain. Concepts can be thought of as cognitive satellites. Cognitive, in the sense they reflect the way actors in the knowledge domain organize their knowledge by reducing complexity in a certain knowledge potential, and satellites because the mean-

ing of concepts is independent from the single subject and figuratively they go into orbit around the actors of the knowledge domain. This metaphor has to be understood in relation to Peirce's extreme scholastic realism. The idea creates a natural class since it is "*a class of which all the members owe their existence as members of the class to a common final cause*". Hence it is the idea that picks out its advocates and gives them life, generative life, as a given class, e.g. the class of occupational therapists.

Summing up concepts are characterized in the following way with affinity to our understanding of knowledge domains

- In a knowledge domain, knowledge is structured and organized on the basis of a general understanding of a particular object field.
- The specific concepts of a knowledge domain do not have to exist as a written special language; the concepts are able to exist as tacit knowledge, which is often the case within knowledge domains during the establishing process, and knowledge domains, which are primarily oriented towards, practice i.e. OT and physiotherapy.
- Concepts are identical with signs in the pragmatic semiotic tradition created by Peirce. Concepts represent a potential knowledge content, which becomes actualized whenever the concepts are interpreted.
- The fixation of common and general idea/ideas creates the basis for the development of the fundamental signs⁴ of the knowledge domain where most of the knowledge becomes organized.
- The development of the fundamental sign, which contains the general idea of the knowledge domain, forms the basis of the conceptual language (special language) in the knowledge domain.
- The fundamental sign and their radial structures form a semiotic, socio-cognitive skeleton of collateral knowledge. We call a sign system consisting of a fundamental sign and its system of related signs the radial structure of the fundamental sign.

Based on this we mean that any knowledge organization should start with an analysis of the fundamental signs and its related concepts of the knowledge domain. The fundamental sign simply grants us an entrance to the knowledge domain. In the following we will return to the definition of the knowledge domain and we will look closer at how it occurs and how the occurrence of the knowledge domain can give us an entrance to the knowledge domain

4. The Birth of a Knowledge Domain

When we know what the focal point to a knowledge domain is, it seems fair to presume that this focus in some degree creates a historical starting point for the knowledge domain. This presumption and the following Peirce quotation are central for our understanding of the birth of a knowledge domain.

Peirce defines an idea in the following way:

Three elements go to make up an idea. The first is its intrinsic quality as a feeling. The second is the energy with which it affects other ideas, an energy which is infinite in the here-and-nowness of immediate sensation, finite and relative in the recency of the past. The third element is the tendency of an idea to bring along other ideas with it (Collected Papers (CP) 1.135).

Every idea has an intrinsic quality (in our case is the intrinsic quality the factor, which separates a knowledge domain from others), an energy with which it affects other ideas and a tendency to bring along other ideas with it. Let us then take a closer look at the knowledge domain of OT remembering the anatomy of an idea. OT rose from the idea that daily activities of any sort are able to rehabilitate patients. Consider a person who has had a cerebral hemorrhage. We must imagine that the cerebral hemorrhage has destroyed a considerable part of synapses in the patient's brain, which has caused paralysis in parts of the patient. The patient is unable to perform the most trivial daily routines like using a fork, drink from a cup, make coffee and so on. Here the occupational therapist enters the scene. Her professionalism (based on both education and working experience) has taught her that the synapses destroyed by the cerebral hemorrhage can be replaced with other synapses. By training the patient these daily routines new synapses are created and the patient will be able to drink from a cup, to eat with a fork etc. Presumably, the patient will never gain the same control he had before the cerebral hemorrhage but he will be able to lead a nearly normal life.

Occupational therapists have performed these training programs numerous times and at some point they have observed that these daily activities have had a positive impact upon their patients and the idea about daily activities has been fixated. The germ to the knowledge domain of OT has been planted. After the fixation the general idea will bring along other

ideas and start growing and eventually become the OT knowledge domain we know of today.⁵

Of course, there is a lot of calculation to make before the fixated idea becomes a knowledge domain e.g. the surrounding society's political, scientific and ethical pressures. But it is fundamental for Peirce that feelings spread within a continuum. And the feeling is the center of the idea, which makes the single idea different from the other. Therefore, ideas or intelligible signs (which are our focus) exist in webs where the single idea is wrapped into other ideas. The single knowledge domain cannot be viewed as an isolated island in the ocean; the single knowledge domain exists in affinity with other knowledge domains, some may even have materialized as a reaction to other knowledge domains. Basically, we mean that an idea has planted the seed to the knowledge domain, which as time goes by grows and spreads and starts to create a special language, i.e. the terminology that reflects the conceptual idea of the knowledge domain. As Peirce writes then symbols have a tendency to grow:

Symbols grow. They come into being by development out of other signs, particularly from icons, or from mixed signs partaking of the nature of icons and symbols. We think only in signs. These mental signs are of mixed nature; the symbol-parts of them are called concepts. If a man makes a new symbol, it is by thoughts involving concepts. So it is only out of symbols that a new symbol can grow. *Omne symbolum de symbolo*. A symbol, once in being, spreads among the peoples. In use and in experience, its meaning grows. (CP 2.302)

And in the growth of the symbols the meaning occurs whereupon all kinds of knowledge rest. Therefore our focus is anchored upon the concepts and their relations, they simply contain the history of the knowledge domain.

If we return to the starting point of the article, we argued that concepts communicate information relatively in proportion to the knowledge level of the interpreter within a knowledge domain. Consequently, some concepts communicate more knowledge to the interpreter than other concepts, and these more fundamental concepts communicate the most possible information to the interpreter, this is respectively called significance-effect and fundamental signs, and below we take a closer look at these concepts.

5. Significance-Effect and Fundamental Signs

The significance-effect is an effect of meaning (Thellefsen, Brier, and Thellefsen 2003, 144) an effect where a certain concept at a certain time communicates the most possible information to the interpreter. But the effect is conditioned by the beforehand knowledge of the interpreter. The more knowledge the interpreter has about the concept the more information the concept communicates. The knowledge level of the interpreter is reflected in the concepts, which communicates information in proportion to this knowledge level. This means that concepts contain a potential amount of information, which is actualized the moment the concept becomes interpreted. But the relation between the concept and its potential knowledge is in such a way that the concept will never communicate all of its potential information. In the same way, there exists an insoluble relation between Peirce's notion on the immediate and dynamical object. The immediate object can never fully capture the knowledge potential of the dynamical object or a certain concept. The significance-effect is a frozen picture of the information value of the concept exactly in the same way a photograph (i.e. a portrait) is the immediate object of the sign, namely the object we see in the picture, where the dynamical object is the living individual who in an instant is maintained frozen in the picture. This can also be explained with reference to Peirce's sign. The sign as firstness is defined as something potential, something positive possible. The object as secondness is defined as an actualization of the sign – a necessity, which in itself also is a sign, and the interpretant maintains the relation between the sign and object by maintaining the interpretive habit which makes a person interpret the sign to mean something. Using the concept *activity* as an example then the knowledge potential of *activity* is the sign, the occupational therapists interpretation of activity in a certain situation is an actualization of the sign's potential, the object. The occupational therapist is used to interpret the sign in a certain way due to hers and the concepts anchoring in the OT knowledge domain. She interpret the sign within the context called OT, thereby the new sign is maintained in relation to the knowledge potential in activity and the interpretation is one in a row of possible interpretations of the knowledge potential, which exists within the dynamical object. However, it is important to stress that the significant-effect is not a subjective effect. It is an effect that arise when a general sign, a

symbol communicates technical information to a member in a knowledge domain. We do not define the significance-effect in relation to personal experiences of any sort. The significance-effect is used as an argument for the necessary steps away from universalistic knowledge organization methods and theories, since it is evident that concepts communicate and create interpretants in relation to the interpreter and the information communicated.

Following in this line of arguments, we are able to formulate the hypothesis that concepts communicate most possible knowledge to the interpreter and the level of knowledge communication is dependent upon the beforehand knowledge of the interpreter. This makes it valid to suggest that a member of a certain knowledge domain has more knowledge of concepts that stem from this knowledge domain than a person outside the knowledge domain. Based on this it is possible to form a general analysis of concepts. Concepts are signs of knowledge, which are specific for the knowledge domain therefore; the meaning of the concepts is conventionalized - symbolic. Within the knowledge domain there exists an agreement on what knowledge the concepts contain, therefore the concepts contain iconical, indexical and symbolic features because they, hence there status as knowledge organisers, refer to the knowledge they contain, and that knowledge is identical with the general understanding of the concept within the knowledge domain. The ideal knowledge contained by the concepts is identical with the dynamical object. The different representations/interpretations of the dynamical object in the shape of immediate objects correspond to the member's interpretations of the concepts.

On the basis of the significance-effect it seems plausible to suggest that the knowledge content in the concepts of a knowledge domain is differentiated. If some concepts contain a greater knowledge potential than other concepts, it is because these concepts have a greater importance and thereby meaning for the members of the knowledge domain. If this is the case then we ought to organize the knowledge in the knowledge domain in accordance with these meaningful concepts – so called fundamental signs, and let us take a closer look at them.

A sentence has the following content (Deacon 1997 p. 176): "These eventually form the *tedencephalon*, made up of the *cerebral cortex*, *limbic system* and *basal ganglia*." This is a linguistic statement. To an actor outside the knowledge domain where the special language stems, the communicated information will

probably not be very significant. Naturally, we will get some basic information: the language is US-English, the terminology is a mix between Greek and English, and without any greater knowledge about anatomy we may be able to see that the terminology refers to neuroanatomy – something about the structure and functions of our nervous system. Here, the boundaries for our knowledge reception lie, and we will not get any further information from the statement – the communication has stopped. We have no problem in seeing that the language contains highly specialized knowledge but we are not capable of understanding this knowledge without a thorough study into neuroanatomy.

In the preceding sections we maintain that special language communicates the most structured and target-oriented information within a knowledge domain. If the knowledge domain makes up the general context where the concepts and special language gather and communicate knowledge, then it is plausible to assume that concepts express a special cognitive mechanism, which organizes knowledge within the knowledge domain. If we return to the terminology from neuroanatomy, then the concepts referred to within this linguistic expression communicate none or at least only little information to a person without knowledge about neuroanatomy. On the other hand, a neuroanatomist will receive a lot of specialized information, and the amount of information communication is essential when it comes to identification of the fundamental signs within a knowledge domain.

A fundamental sign is a concept which is central for the actors in the knowledge domain and which exists in a web of related concepts. It is a concept, which communicates the most possible information to the actors and which is fundamental in the understanding of the research objects the knowledge domain has at center for its investigations. It is a concept that contains the basic values of the knowledge domain; it carries the knowledge domain's sense of community. No terms can be understood correctly without prior knowledge of the fundamental sign.

The fundamental signs are the fundament where the self-understanding, the very identity of the knowledge domain rests. The fundamental signs are the fundament, which constitutes the terminology. The professional self-understanding, which in the knowledge domain is reflected in the terminology, marks out the boundaries of the knowledge domain. This is caused by the fact that some concepts due to their historical development have greater importance

for the knowledge domain, and this greater importance results in a greater knowledge potential, where other concepts very well can be related to the knowledge domain but in a more peripheral way. The same peripheral concept is able to be a fundamental sign in other knowledge domains but with another potential for this particular knowledge domain, which grants the concept a more central place. Consider *Movement Science*, which is a fundamental sign for physiotherapy, which gathers and communicates information to the physiotherapists. This concept is also used in OT but here it holds different meaning and here it is not a fundamental sign.

Naturally this is a question of interpretation. What is important and not important in a knowledge domain may vary from actor to actor. It is not hard to imagine that there may be an occupational therapist somewhere who deeply feels that *Movement Science* should have a greater place in the consciousness of OT. However, it must be the history and the democracy, which determine the importance of the concept's knowledge potential.

The consequence of the viewpoint is that the terminology of a knowledge domain is very important. We even go a bit further and state that the existence of a knowledge domain depends upon the existence of a special language. There can be different degrees of scientific character in different knowledge domains. Some knowledge domains may have a long history and tradition and have a well-established and specific terminology. Where other less matured knowledge domains still struggle to define and specify their terminology and to obtain a knowledge agreement within the special language. The terminology simply constitutes the knowledge structure of the knowledge domain. And the fundamental signs create the cognitive fundament upon where the knowledge domain builds, and these fundamental signs express the knowledge that the majority of the actors within a given knowledge domain can concur in is focus for the knowledge domain hence the democratic aspect. In this way the fundamental sign creates consensus, about what the objectives of a given knowledge domain really is. However, a question occurs: what does the fundamental sign consist of? If the fundamental sign is the basis for the knowledge domain, then it has to be more than the sign in itself. The answer is: a fundamental sign only becomes a fundamental sign by virtue of its related concepts which occur during the semiosis of the sign where the sign during its development creates other sign - in this case related concepts. The fundamental

sign is a sign, which has a vast number of related concepts. Each related concept interprets qua its linguistic expression, an aspect of the fundamental sign and the relationship between the fundamental sign and the related signs is in the same way as the relation between the dynamical and the immediate objects. In this way the meaning of the related concepts are maintained by the fundamental sign in accordance with its knowledge potential. And the related concepts are only understandable in relation to the fundamental sign. *Activity dysfunction*, *daily activity*, *activity analysis* only makes sense if one has beforehand knowledge about *activity*. The fundamental sign is the centre in a concept structure consisting of related concepts. We call the fundamental sign and its structure for the radial structure of the fundamental sign (See figure 2 below)

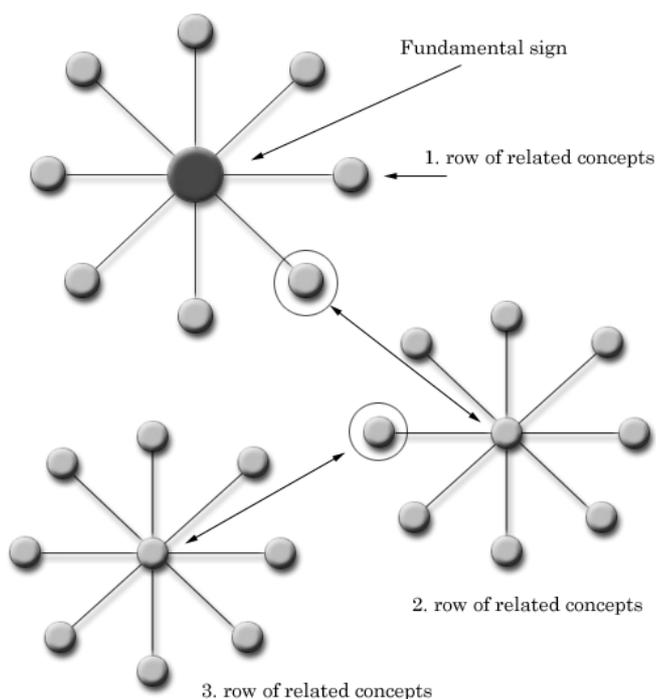


Figure 2. The figure shows the fundamental sign and its related concepts. Naturally, this is a reduction of complexity, as the figure does not show the concept relation between the different rows of the related concepts. It is not difficult to imagine that a concept from third row can be related to a concept from the first row. But still, the figure emphasizes the idea about the knowledge range of the fundamental sign. The fundamental sign is affecting the related concepts in both the fourth and fifth row, but we presume that the influence becomes weaker and weaker the farther we get, and where the related concepts are under influence from other fundamental signs from other knowledge domains.

With the definition of the fundamental sign and the significance-effect an important question remains to be answered. How can these concepts help us organize knowledge in a knowledge domain e.g. OT?

The method we have chosen to use and elaborate is an explorative research method, which has its basis in classical anthropological research, where the anthropologists traveled to foreign countries. Having experienced the foreign culture, the anthropologist sat down in a convenient place and wrote down what he saw. After this field work he returned home to civilization, wrote and published a monograph containing his observations of e.g. engagement rituals among native people in Sumatra. The method was valid (and used many times) until the natives became able to read what the researchers wrote. They could not recognize themselves in the descriptions. Then what is the problem?

Naturally, this description of the anthropological research method is highly caricatured but in proportion to our goal, which is to create a knowledge organization method that can cope with the knowledge differentiation in concepts, this caricature is interesting.

If we choose to put on our rucksack and camp in a knowledge domain with the purpose to organize its knowledge, then we will make the same mistake the anthropologists made, and the same mistake the developers of universal classification schemes make. We will describe an object field that we do not have any knowledge about and which we are not a part of. In order not to commit this gross mistake it is necessary to team up with actors from the knowledge domain, who are capable of guiding us around in the knowledge universe and explain to us what we observe and how to understand the observations.

6. The Fundamental Sign and The Knowledge Profile

As discussed in (Thellefsen 2004, 507-514) the fundamental sign is identifiable in its related terms. The related terms are consequences of the fundamental sign that have been tested and eventually have become symbolic signs of knowledge. New consequences tested and validated, can alter the structure of the fundamental sign; hence knowledge is fallible and provisional. However, since the fundamental sign is a symbol, that has grown stable by use and experience, i.e. the habits of conduct of the members in certain discourse communities, only parts of the fundamental sign structure can alter, or else we are

dealing with a shift in paradigm. Being a symbol that constrains and governs all its related concepts it must contain a telos, a certain aim or ideal of the knowledge domain. An aim the knowledge domain seeks to fulfill. If it did not contain any telos, the actions of the knowledge domain would be arbitrary and no one will probably claim that the works within a knowledge domain are arbitrary. Furthermore, since the aim of the knowledge domain also contains its values, it seems clear that it is necessary to identify the fundamental sign. Consequently if we identify the fundamental sign, we identify the telos and the values of the discourse community, and it seems evident that the knowledge of a given discourse community is or should be organized in respect to the values and telos, consequently it is organized in respect to the fundamental sign.

Then, how do we find the starting point for the knowledge organization – the fundamental sign of the knowledge domain? We can use the knowledge profile. In (Thellefsen 2004, 3) the knowledge profile has been thoroughly defined and discussed, therefore, we will not resume it here. However, we can say that the knowledge profile aims at identifying the most basic elements of a given knowledge domain. A profile aims to present the most significant features of the object profiled. The most significant features of a knowledge domain are its values and telos contained in its fundamental sign.

7. Conclusive Thoughts

We have used Peirce's definition of an idea as basis for the semiotic knowledge organization method. As we remember, according to Peirce the idea contains an intrinsic feeling, an energy whereby it can affect other ideas and a tendency to bring along other ideas with it. Compared with Peirce's idea of the growth of symbols and their spreading of meaning, it indeed becomes very hard to maintain a universalistic approach towards knowledge and knowledge organization. The consequence is that we need a more developed and differentiated definition of knowledge, a conceptualization, which is anchored in semiotics and pragmatics. We have in this perspective defined knowledge the following way:

- Knowledge is the result of communicative processes.
- Knowledge creates stable interpretive structures – habits upon which communicative processes can rest and develop.

- Knowledge is carried by the concepts of a knowledge domain and it can be identified in the relation of concepts to other concepts within the knowledge domain.
- The one way to identify the conceptual structure of a knowledge domain is through its expressions that are communicated by linguistic signs, which attain their meaning in their relation to the concept.

Further, we have clarified the definition of the knowledge concept by maintaining that it is based on a realism, which anchors our knowledge about our surroundings in accordance with an objective existence of the surrounding world. We turn away from the knowledge concept in the humanities because knowledge in our definition is independent from an interpreting individual. Our knowledge concept is interdisciplinary and is based upon semiotic constructivism where knowledge is constructed through semiosis. The appearance of the significance-effect and the fundamental sign are the consequence of this knowledge concept and with basis in these concepts we have developed a semiotic knowledge organization method, which is very different from known and used knowledge organization methods.

In the introduction we wrote that our observations concerning the differentiated knowledge communication of concepts could be the beginning of a revolution within knowledge organization. Naturally, we hope, that the described theory is what catalyses the necessary revolution in order to escape the universalistic way of thinking and instead put the semiotic knowledge organization in focus, which in our opinion produces a far more realistic knowledge organization in terms of reflecting the knowledge structures of knowledge domains.

Notes

- 1 KOS is short for Knowledge Organization Systems
- 2 See T. Thellefsen 2001 for further elaboration of this matter.
- 3 We use CP to refer to Peirce's Collected Papers (Peirce 1931-1966)
- 4 Later in the article we define and discuss the fundamental sign.
- 5 We have conducted an investigation within Occupational Therapy, which has shown that *activity* is central to the field and therefore rightfully can be labeled a fundamental sign

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