Ágnes Hajdu Barát (University of Szeged)

From paradigms of cognition and perception to phenomenon

Abstract
The focus of this research is to clarify the role of the phenomenon in perception and its relationship with the cognition viewpoints, and, more broadly, knowledge organization. I will explain how the phenomena relate to the interoperability and natural connection between phenomena and knowledge. Finally, I will demonstrate the importance of the semantic elements.

1: Aim and scope of the study
This paper aims at exploring the possibilities of perception and cognition in the field of knowledge organization (KO) from an epistemological approach. My purpose is to reveal some examples of new elements in the theory and practice of KO and to emphasize its necessary connection to human perception, phenomena, and content dimensions.

Knowledge changes continually; it is dynamic. Knowledge sources are everywhere, and the exploration of these sources brings about new cognitions, deeper understandings, shifted viewpoints, and additional semantic elements. This “new”, contemporary knowledge often establishes new and different connections between disciplines, subject fields, and even scientists.

“The urge for new knowledge is at the same time an urge for a new way of thinking about knowledge and its meaning for humans and societies, keen to indulge in a search for new knowledge beyond the currently accepted methodologies.” (de Beer 2009, 48)

On the other hand, the constant and unchanging knowledge can have a different meaning for different users, who have diverse experiences in various circumstances.

2: Methods
The paper studies the epistemological questions theoretically; summarizes the knowledge from different sciences according to perception, phenomena and their influences; and makes a case for cognitivism in knowledge organization systems (KOS).

3: Research implications
It is widely agreed that cognition provides the basis for concept-building; however, at the next stage of processing, there is a debate. Fundamentally, what is the connection between perception and the superior cognitive processes? This paper points out the obvious connection between visual imagery and the Internet and then considers the connection between perceptual access of KO and phenomena. I am going to clarify the role of the phenomenon in perception and then in KOSs. At the end I will explain how the phenomena relate to interoperability: that is, how can both stability and changeability be feasible at the same time and in the same system?

Librarians and KO specialists need to identify this knowledge in daily processes in order to consciously separate the phenomena from the meanings, knowledge, and concepts.
4: Phenomena determine cognition and perception – and, inversely, cognition and perception determine phenomena

In general, cognitive theory attempts at understanding such human mental activities as recognition, comprehension, inference-making, interpretation, judgment, memory, and imagination. There were several approaches to perceptual and cognitive processes in the history of epistemology. After the 16th century, two main epistemological judgments dominated philosophy: empiricism, which considers knowledge as the product of sensory perception, and rationalism, which considers knowledge as the product of rational reflection. The implementation of empiricism in the newly developed experimental sciences led to a view of knowledge that is still explicitly or implicitly held by many people today: the reflection-correspondence theory. According to this view, knowledge results from a kind of mapping or reflection of external objects, through our sensory organs, possibly aided by different observation instruments, to our brain or mind (Heylighen 1993).

Perception and visualization relate to mental visual imagery. There is an idiomatic expression: something appears “in the mind’s eye”. What does that mean? There are many researchers who think that pictorial representation is not simply a map of real objects, but rather a reflection of the human mind that makes them.

Although visualization is a common action that we do almost every minute, the theory of mental pictures, as well as the full process of cognition, is not yet well understood. Notion defines and circumscribes phenomena.

Visual imagery plays an important intellectual role, quite like information processing or data processing, memory, learning, abstract thinking, and linguistic comprehension. Visual perception is a complex process. It begins with sensation, but after that, visualization becomes quite individualized. Perception depends, for example, on experience, knowledge, cognition, and our system of symbols. This process is an explicit, multi-level and symbolic work of the mind (Hajdu Barát 2007).

One may explain or interpret perception through both interesting historical experience and modern engagements. There are many examples of naturally occurring fractals, but finding the in the historical collection is very unusual.

4.1: The Mandelbrot monk: 2 cases

On a holiday visit to Aachen cathedral, Bob Schipke – mathematician, a retired professor of combinatorics – saw something that amazed him. In a tiny nativity scene illustrating the manuscript of a 13th century carol, O froehliche Weihnacht, he noticed that the Star of Bethlehem looked odd. On examining it in detail, he saw that the gilded image seemed to be a representation of the Mandelbrot set, one of the icons of the computer age.

The next day, Schipke gained access to ecclesiastical archives, where he found a document called the Codex Udolphus. Written in illuminated Latin, with informal marginalia in Greek, the Codex bore the signature of Udo himself. While uncovering more interests – an anticipation of the Buffon's Needle technique and method – in the final and longest chapter, Salus, Schipke uncovered the most radical work. Udo had, it seemed, investigated the Mandelbrot set, seven centuries before Mandelbrot (Girvan 1999).
Nobody expected to find such a thing. We don’t think it is only an example of imposing elements of the modern world on the past, but we are sure the monks haven’t known and couldn’t visualize the fractals in that time.

Therefore, dynamic characteristics of knowledge are due to reversible relationships of determination, cognition, and perception. If we use (chose) any cognitive methods to study anything, we get a reflection of that thing (we have a perceptual image in our mind); strictly speaking, we got information about the phenomenon, but we couldn’t know the thing. If we use the other methods or if we see the thing from different points of view, the manifestation we would get would create different imagery about some “other phenomenon”.

On the other hand, if we have a presentiment of the phenomenon, we would predetermine our cognitive tools and methods. Likewise, the cybernetic says its fundamental principles about methods and phenomena. Smiraglia (2002) writes that “we can use theory to analyze, predict, and manipulate phenomena”; and my addition: we can use the phenomena to determine cognition and perception.

5: Sense-making
Sense-making is the aptitude, ability or attempt to make sense of an ambiguous situation. Ambiguous situation come about because there are more persons with their own knowledge, practices, behaviours and observations. More exactly, sense-making is the process of creating situational awareness and understanding in situations of high complexity or uncertainty in order to make decisions. It is “a motivated, continuous effort to understand connections (which can be among people, places, and events) in order to anticipate their trajectories and act effectively” (Klein et al. 2006a).
Brenda Dervin represents in her research the sense-making approach of information seeking and information use. The topic of sense-making is very popular and, since its beginnings in 1972, it has developed in different aspects. Dervin (2003b; Dervin & Dewdney 1986) rejects the idea that information is a commodity, and asserts that information is constructed by people. Dervin (1977, 22-23) goes further to define three types of information: information-1 is objective, incomplete, and includes external reality; information-2 is subjective and includes internal reality; and information-3 includes the way in which a person becomes informed. The main idea of sense-making is “how people make sense of their worlds”. As an approach and methodology, sense-making allows the audience to see how the individual person views a situation (Dervin 2003a, 223). The listener could be a librarian and he/she should understand the users who have different approaches about the information, the action, situation, and attitude etc. As a person moves through time-space, she develops her unique point of view from personal experiences and observations, and at some point, she comes to a stopping place, or gap, where sense runs out, and then needs to bridge the gap in some way (p. 224). This advanced approximation gives users the opportunity to use their own terms, instead of the defined terminology used by librarians and within library systems.

Sense-making would be in individuals and organizations also. In individuals, sense-making is the primarily cognitive activity of constructing a hypothetical mental model of the current situation and how it might evolve over time, what threats and opportunities for each action are likely to emerge from this evolution, what potential actions can be taken in response, what the projected outcomes of those responses are, and what values drive the choice of future action. Dervin has researched individual sense-making, developing theories underlying the cognitive gap that individuals experience when attempting to make sense of observed data.

In organizations, sense-making is a collaborative process of creating shared awareness and understanding out of different individuals’ perspectives and varied interests. The process of moving from situational awareness in individuals to shared awareness and understanding and even further to collaborative decision-making can be considered as a socio-cognitive activity in that the individual’s cognitive activities are directly impacted by the social nature of the exchange and vice versa (Wikipedia 2008).

If we would like to give an example, we should think about the processing of making and teaching thesauri. When we teach the relations between a main descriptor and other descriptors we can use only any didactical, but unreal, wrench descriptors (that is, without the system or knowledge of the entire collection of descriptors) and students struggle to understand the system and rules of relations, because they have their own terms, concepts, visual imagery, and approaches to the used descriptors. Particularly there is this sensitive uncertain situation if there is specified or pars, and higher or totum relations. Generally we find that if the students have some special knowledge about the topic, they usually define more pars and totum than without this knowledge. Later, they don’t have these problems when working in the full system, because they can define the descriptors and their relations to each other. There is a similar circumstance in the process of informational retrieval. The users know their viewpoints in the level of phenomena, and these phenomena determine the cognition and perception – and inversely.
Perception and sense-making play an important role in digital circumstances as well. Nicholas J. Belkin and other researchers at the Rutgers University School of Communication and Information are investigating ways to improve the ability of people to find information they need in digital libraries. By examining the interaction of factors such as the searcher’s location, individual characteristics, the nature of his/her task, and similar data, the team will create a personalization assistant that will help searchers use digital libraries more effectively (Belkin 2009).

This project focuses on the following concepts among others:
- Individuals’ interactions with information and with information systems
- How to make such interactions effective and pleasurable

These points should consider knowledge that the phenomena determine the cognition and perception and, inversely, that cognition and perception determine phenomena. These attainments, consequently, have a clear, practical use.

6: Phenomena and knowledge
After this processing we arrive to phenomenon “only” and have not established any knowledge, but we can perceive the differences between phenomenon and knowledge, and we can perceive the dynamics of knowledge.

No progress of any kind can be expected without a comprehensive understanding of knowledge and of knowledge work, in terms of a new and different idiom. In order to facilitate this new approach, we have to take a close look at the main requirements for a professional regarding the issue of knowledge in particular (de Beer 2009, 49). Mason offers excellent guidelines in this respect. He writes:

“Information professionals possess specialized knowledge about knowledge itself which they use to improve the intellectual state of people. Information professionals empower their clients to understand and to know. [...] This empowering information [...] consists of the signs and symbols that one mind uses to influence another mind. Information professionals are the people who carry out this process of influence on the mind. To be more precise, information professionals are mediators between one mind [...] and another mind.” (Mason 1990, 123-124)

The concept of knowledge is a much more complex issue than that of phenomenon. The classical scientific methods, tools and epistemology reduce reductionism to recognition of the world. It tries to simplify every occurrence to another that is more fundamental and simple. This approach may describe the world more easily, but its imagery is too simplified for the complex real world. This method takes the cognition individually. Users have their own perceptions, cognitive processes, viewpoints, experiences, socialization and circumstances. Knowledge has become changeable, dynamic, and complex in the Internet age. There is the necessity to find the solutions that uncover the relationships, consequences, interconnections, complexity and depth. Good naturalization, naturalized epistemology, and cooperative naturalism try to describe this complex knowledge theoretically. Interdisciplinarity, interoperability and facet analysis help to represent this knowledge in the field of KO.

Some relevant recommendations regarding the future of KO, with emphasis on the importance of phenomena emerged during the 8th conference of the ISKO Spanish chapter in León, between 18 and 20 of April 2007. As the León Manifesto declared:

“instead of disciplines, the basic unity of the new KOS should be phenomena of the real world as it is represented in human knowledge;
the new KOS should allow users to shift from one perspective or viewpoint to another, thus reflecting
the multidimensional nature of complex thought. In particular, it should allow them to search
independently for particular phenomena, for particular theories about phenomena (and about relations
between phenomena), and for particular methods of investigation.” (ISKO Italy 2007)

As Brian Vickery observed while commenting the León Manifesto in connection
with phenomena:

“My feeling is that phenomena should indeed be separated out, but that parallel to that listing there
could be a second listing of human activities. Phenomena I take to be (our knowledge of) entities, their
properties and interactions, that exist in nature (from elementary particles and forces up to the world
ecosystem, or the cosmos), in society (from individual people up to the human community), and as
human artefacts. But the human activities of investigating natural and social entities, of undertaking
personal and social actions, and of manufacturing artefacts of all kinds, are equally needed in a
documentary classification. [...] So overall, the Phenomena classes would list what is known to exist in the world, the entities and their
characteristics.” (ISKO Italy 2007)

7: Further questions
What does the relationship between phenomena and knowledge denote? How can a
KOS mediate the differences between phenomena and knowledge? Can interoperability
resolve these paradoxes? How could both stability and changeability be feasible at the
same time and in the same system?

8: Conclusion
What does it mean for librarians and information specialists to draw a parallel between
the semantic relation and the cognitive process? Librarians need to identify those
favoured semantic elements that stimulate a similar conceptual image both in the mind
of the librarian and in the mind of the user. For a fresh perspective, an understanding of
perception is required as well (Hajdu Barát 2007, 351).

These establishments imply comprehensive rethinking of knowledge and information
along new and completely different lines. Knowledge work cannot be pursued without
such new explorations and reflections.

References
Belkin N.J., 2009, Personalization of the digital library experience: progress and prospects,
PooDLE Project, Rutgers University School of Communication and Information,
<comminfo.rutgers.edu/imls/poodle>.
Nuevas perspectivas para la difusión y organización del conocimiento: proc. Ninth Spanish
ISKO Chapter Conference, Valencia, 11-13 March 2009, Universidad Politécnica de
Library Quarterly, 13, n 3, p. 16-32.
Dervin B., 2003a, Audience as listener and learner, teacher and confidante: the sense-making
approach, in B. Dervin, L. Foreman-Wernet, E. Launterbach eds., Sense-making methodology
Dervin B., 2003b, Information as non-sense; information as sense: the communication technology
connection, in B. Dervin, L. Foreman-Wernet, E. Launterbach eds., Sense-making
methodology reader: selected writings of Brenda Dervin, Hampton, Cresskill, p. 293-308.
Dervin B., Dewdney P., 1986, Neutral questioning: a new approach to the reference interview,
Reference quarterly, 25, n. 4, p. 506-513.

*Web sources have been accessed 31 August 2009.*