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The actual role of metaphors in knowledge organization

Abstract

In the paper I argue that metaphors widely used in presenting knowledge organization, despite of their methodological correctness, play an ambiguous role. They are mostly conceived and used as models of information/knowledge organization such as library documents, databases and internet tools and devices. But due to their suggestive power and pervasive role, they can also obscure the structure of such organization. One can expect explanatory (descriptive) benefits from spatial (e.g. terrestrial or aquatic) metaphors comparing modes of organizing and accessing knowledge to oceans, pathways networks or even rhizomes. But mapping or metaphorically presenting cognitive undertakings such as searching, browsing or retrieving information/knowledge can obscure their actual essence. As held by the cognitive theory of metaphor (Lakoff, Johnson, Ritchie), certain aspects of complex phenomena (i.e. knowledge organization) are repeatedly obscured and hidden. I argue that metaphors containing probability concepts, although not immediately intuitive or comprehensible, are more fruitful effective in mapping knowledge organization.

1. Spatial mapping of information/knowledge organization

The most recent conceptual and historical studies concerning different types of knowledge organization presentations (Cf. *Knowledge Organization*, 40(6); *Library Trends*, 61(2)) as well as some earlier ones (Case, 1991), show the specific role of metaphors used in conceptualizing the nature of different knowledge resources - libraries, databases, information repositories, office filings, and various types of internet holdings - and how they are understood and explained. Metaphors are used as linguistic tools of variable methodological validity (of mapping and explaining) useful in presenting different types of what Mazzocchi describes as the "cognitive space of knowledge" (Mazzocchi, 2013, 367). The cognitive space is meant here as both intellectual (perceptual, mnemonic, imaginative) and practical (behavioral, institutional, instrumental) endeavors performed by people as they cope with information and acquire knowledge. This metaphoric way of thinking prevails and subordinates our everyday thought and action, but it is not without certain consequences.

While analyzing the cultural context of metaphors as used over the decades, Mazzocchi distinguishes the map, the labyrinth, the tree, the net (network), and the rhizome. He classifies them as examples of "arboreal thinking" wherein spatial conceptualization prevails. All of the same have been used as tools for categorization and classification of both world and knowledge. But their value varies with regard to their representation of power. If the tree were a dominant and unquestionable depiction of ancient and early modern knowledge categorizations, while labyrinth and/or network were obviously typical of the more recent times, the *rhizome metaphor* seems to be prevalent in non-linear and multiple universes of knowledge in the Internet era, one that does nonetheless evoke certain controversy. It grasps such characteristics of the world's complexity as connectivity, heterogeneity, multiplicity, decentralization etc. "The metaphor of rhizome also undermines the belief that a clear distinction between the traditional concepts of subject and object can be made" (Mazzocchi, 2013, 368). Its attraction due to the metaphor's suggestiveness - rhizome as an image of structural complexity - causes interpretational ambiguity.

The role of metaphors in knowledge organization/library studies is also emphasized by Fedeli, who investigates in particular changes observed both in terms of linguistic (figurative) domains - mapping and communicating information and knowledge - and technology-enhanced methods of organizing knowledge - digital encyclopedias and libraries, databases etc. Not every metaphor plays the same role, metaphoric thinking may indeed significantly change, rather than merely present, the mapped area. In his opinion: "What these metaphors emphasize is the difficulty of conceptually and pragmatically identifying an organization of information space suited both to interconnections between disciplines and between encyclopedia entries as well as to natural changes in the universe of knowledge over time" (Fedeli, 2013, 375). Simple metaphors such as a labyrinth or a map of the world or the waters have been used since the Enlightenment to grasp the correlations between different knowledge elements - gathering information, entries or bases. Although successive metaphors have changed over the decades, the main aim of classification and categorization remains the same - "discussion of the concept of 'knowledge space' and the possibility of organizing this space by mapping its dynamic linguistic-conceptual aspect" (*ibidem*). Sophisticated metaphors such as labyrinths, the free-scale networks, and the hypertext which can be found in the most recent theories are still designed to present (map) the semantic correlations in the knowledge structure. As digital coding greatly multiplies these correlations, the role of metaphors containing complex domains increases reciprocally. "It is a remarkable fact that we are seeing proliferation of metaphors which come to life in electronic space and always have as their primary reference a strategic concept for the organization of knowledge" (Fedeli, 2013, 381).

The same conclusions are reached by Marras, who follows Lakoff and Johnson's cognitive theory of metaphors as well as Fauconnier's conceptual blending. She distinguishes between two *spatial metaphors* - terrestrial and aquatic - and holds that from the methodological point of view both capture two important elements: interrelations between scientific disciplines (domains) and the knowledge related to them. The "double presence of these two metaphoric conceptual (blended) domains" concerns therefore two other behavioral elements: *navigating* information/knowledge bases and *spatial terminology* describing *activities* related to the web of knowledge. All former and current metaphors of knowledge organization suggest the following crucial points: (1) the concept of open landscape for research; (2) fluid access to sources; (3) the need for standards of specific information usage (that does not violate privacy); (4) joint research in the social communities of the web; and finally, (5) "a challenge in the models of knowledge organization and management". The latter is of particular significance as it concerns not only the objective structure of knowledge but also agents' activities toward it. "It is necessary to create innovative environments in which a plural access to individual disciplines and topics can correspond; environments that can enable individuals to create, imagine, and preserve information in personalized, idiosyncratic spaces as well" (Marras, 2013, 394). "Innovative environments" might be conceived into two ways: (1) as linguistic projects of metaphors' designing; and (2) practical guidelines in terms of the information systems management; in both cases the metaphorical aspect remains important. But what types of metaphors are best suited for this purpose?

Generally speaking, they are based on *pictorial icons*, as observed by Donald Case a decade ago. Their focus is twofold: (1) on information as particular cognitive *objects*

and (2) on users' *attitudes* toward them. Apart from gathered and retrieved information which constitutes knowledge, their interest lies in the "information behavior of knowledge workers". The way that these agent-oriented metaphors function was revealed by the experimental analyses of "how does the historian manage - through spatial placement and physical and mental labeling - the large quantities of text that are gathered in the process of creating of 'original' work" (Case, 1991, 660). Specifically, Case recalls his study of American historians, particularly their reports (interviews) on the methods commonly applied in research. Almost all of the historians surveyed used metaphors to describe how they conceived metaphorically information, and reciprocally, what they actually did with their research material (i.e. data, texts, ideas). He admits that the design of information systems must consider the "physical places in which users work with documents and carry out storage and retrieval actions". These places include both libraries/offices and personal settings (to which he jointly refers as "private knowledge environment"). "It is clear that effective use of analogy and metaphor must be based on knowledge of the potential users - not all icons or actions will be familiar to everybody" (Case, 1991, 658). As information systems become ubiquitous and penetrating, investigating them seems to be very important both for scientific and practical reasons; indeed, proper organization of metaphoric thinking allows one to build effective information systems. Case's remarks correspond to Lakoff and Johnson's categories of *idea metaphors* (content of thought as a coded object) such as "ideas are organisms" or "ideas are products". The most powerful metaphor in his research turned out to be "the card metaphor" as historians are often trained to collect and manage information in card-like pieces (i.e. chunks or stocks).

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The abovementioned examples of spatial/informational metaphors reveal, as I want to emphasize, that they represent only one feature of knowledge organizations - their *complex* structure and tendency towards *narrowing* their limits. However, newly emerging, digitally transformed "innovative environments" or "cognitive spaces of knowledge" constitute a somewhat different, ontologically specific domain which requires a different way of presentation. The dominant feature of this domain is *potentiality*. This is why new metaphors and different methodological assumptions are needed to grasp its essence. One should not forget the fact that particularly *cognitive* theories of metaphors provide us with better understanding about the role they play in explaining complex knowledge systems; these theories reveal namely what metaphors as such can hide in the mapping phenomena.

2. What do information metaphors hide?

The linguistic and communicative nature of metaphors entails a certain limitation discussed in cognitive science and communication theories. Gibbs recognizes a specific "«paradox of metaphor» in which metaphor is creative, novel, culturally sensitive, and allows us to transcend the mundane while also being rooted in pervasive patterns of bodily experience common to all people" (Gibbs, 2008, 5). The same fact was also recognized earlier by Lakoff and Johnson: "[A] metaphorical concept can keep us from focusing on other aspects of the concept that are inconsistent with that metaphor" (Lakoff & Johnson, 1980, 10). This seemingly contradictory nature of metaphoric thinking means that people who are engaged in it (both in creating and using) are not able to transcend their bodily and culturally entrenched limits. Undoubtedly, this

paradox pertains to all cognitive undertakings and knowledge areas which are, for many reasons, treated metaphorically. Neither experts (information science theorists, knowledge managers and librarians) nor laymen (users of information/knowledge systems) are immune to these effects. But this phenomenon has not been hitherto properly recognized in the knowledge organization theories which is not without significant consequences.

Cognitive and communicative functions of metaphoric conceptualization help people in revealing complex, unexpected and not evident aspects of the experienced world. Metaphors are used as an effective means of persuasion in mass communication or public opinion molding. They are particularly useful in expressing and presenting people's expectations about the outcomes of decision-making processes. With the increasing need to solve practical or cognitive problems, their proper metaphorical expressions become important. *Information metaphors* - metaphors both dealing with and using the concept of information (in their role as a source and/or target) - play a particularly crucial role. But if metaphors can *obscure* or even *hide* what they aim to highlight, this ambiguous (and at the same time unavoidable) feature makes the subject both difficult and challenging.

The role of information metaphors was recognized a few decades ago by Shannon and Weaver in their "mathematical theory of communication", although did not have any special impact on the linguistic context. Nevertheless one can treat their considerations as promising because they approached what Mazzocchi termed as the "cognitive space of knowledge" (knowledge organization) from the perspective of the informational, quantified model of communication. At the beginning of the paper they admit, in a very anticipative way, that "this word information in communication theory relates not so much to what you *do* say, as to what you *could* say" (Shannon & Weaver, 1964, 8). They remarkably hold that any linguistic expression (not excluding metaphors) used in defining the essence of information or communication ought to concentrate on *possibilities* rather than *facts*. Conceiving information as a mere physical thing deprives it of its abstract sense which depends on its *probabilistic* nature. Knowledge is a *possibility* emerging from information and communication organization. "The concept of information applies not to the individual messages (as the concept of meaning would), but rather to the situation as a whole, the unit information indicating that in this situation one has an amount of freedom of choice, in selecting a message" (Shannon & Weaver, 1964, 9). The authors try to render the abstract "amount of freedom of choice" more tangible and conceivable. The abstract choice is obviously limited by particular situations with which the decision-making agent is confronted. The "probabilities which are not independent, but which, at any stage of the process, depend upon the proceeding choices" (*ibidem*) always have to be somehow conceptualized. This is why metaphoric thinking occurs and prevails.

Shannon and Weaver proceed typically, by choosing suggestive examples of what information is and how it is correlated with communication. They appeal to empirical examples (e.g. telegraph, radio) which are information metaphors deepening the probabilistic content of knowledge by indicating the choice of possibilities. "[I]nformation, in communication theory, is associated with the amount of freedom of choice we have in constructing a message" (Shannon & Weaver, 1964, 13). The core of any communication or knowledge system is therefore "handling any message that the source can produce" and any agent (destination/recipient) that receives it. In all these

cases, regardless of the communicating systems, conveyed symbols or knowledge organizations, what really matters is making the *proper choice among the possibilities* present at the source. These possibilities concern choosing the signals that *constitute* the message, in other words, the information that constitutes any possible knowledge organization. And then the issue of properly mapping out such constitutions - choosing the possibilities that given information/knowledge organization offers - comes into prominence as well as the question of what exact metaphors are actually adequate for the same?

3. Dynamic metaphors of probable knowledge

Shannon and Weaver's model inspired other attempts to map out the organization of communication/knowledge. As observed by Reddy, especially the *conduit metaphor* that results from the same suggests that: (1) communication and immanent knowledge function like a conduit transferring a person's thoughts, news and information; (2) people imbue words with their thoughts and emotions; (3) they convey them to others; (4) listeners or readers once again extract information from the words, texts, documents, news, and data. "In this case, the conduit of language becomes, not sealed pipelines from person to person, but rather individual pipes which allow mental content to escape into, or enter from, this ambient space" (Reddy, 1993, 170). Thoughts and knowledge are presented as mental content of communications. The conduit metaphor suggests that communication and knowledge organization are admittedly complex but linear, serial, one-directional and fully determined. This simplified model has dominated scientific and popular way of conceptualizing is the nature of communication and knowledge organization since the mid 20th century.

Reddy suggests, however, that the conduit metaphor is not an adequate model of knowledge and communication, and therefore he proposes a different one. The new model, more abstract than the former, called the *toolmakers paradigm*, conceives communicating people as isolated in slightly different environments within which they organize knowledge. They are located in "a huge compound, shaped like a wagon wheel", where they live independently. They have the opportunity to exchange only small sets of instructions about what they do and how they cope with their environments. And all that happens "at the hub of the wheel" where the direct exchange involves not things in the environments, but only instructions relating to them. People know of one another's existence indirectly, solely through "a cumulative series of inferences". They can reciprocally convey their thoughts and act effectively on this basis. This actually happens if communicating people are deeply engaged in common endeavors during which conveying the information - embedded in knowledge items such as library holdings or databases - is the initial and final task. And it happens in the abstract domains, in the "cognitive space of knowledge".

In the toolmakers paradigm the agent's mental states such as imagining, evaluating or forecasting are metaphorically understood in terms of the familiar realm of dice, roulette wheels, coins and other gambling devices. Decision-making is intuitively compared with tossing up or placing bets in randomized games. Consequently, people become caught up in suggestively perceiving problem solving and decision making as games, plays, or receiving news. The *probability* of scientifically investigated events (e.g. statistics) is crucial at such times. But it has two meanings - statistical and epistemological - which have been misread for centuries. As Ritchie admits:

“Statistical probability was the sole legitimate form of probability, the sole basis for knowledge. Consequently, »statistical probability« - and the associated world of »randomizing devices« - has become a metaphor for epistemological probability” (Ritchie, 2003, 11). The *epistemological probability* is the result of preferred theoretical (including metaphorical) interpretations but not statistical facts, that is correlations between events. In this case, conversely and paradoxically, the formal feature is used as the source for presenting the target – the agent’s mental state of uncertainty. In other words, what is abstract serves as a metaphor for what is concrete.

There are therefore *objective* as well as *subjective* aspects of probability of knowledge, the two of which are very often confused. People commonly conceive probability as a state of their beliefs but not events or affairs. When statistical probability becomes a metaphor for the possessed knowledge (i.e. interpretations) it serves, as remarked by Ritchie, as “a kind of shorthand for the complex web of reasons that underlie social processes, and an approximation of the way these reasons are balanced in the decision-making process” (Ritchie, 2003, 11). This metaphor serves the cognitive function of supplying an explanation for unstable, unpredictable, obscure epistemic phenomena such as, for example, the Internet and any of its particular tools - browsers, indexing devices etc. Besides, to a certain extent it plays the rhetoric (persuasive) function of encouraging people to perform special cognitive-social acts, e.g. blogging or twittering with expectations of somehow benefiting from these randomized events. In short, the “probability metaphor” suggests a different perspective on knowledge acquisition and organization.

4. Conclusions

In abovementioned cases, metaphors, as I ultimately wish to emphasize, either obscure and hide (as spatial or conduit metaphors do) that which they should in fact to reveal; or present (as the toolmaker's paradigm) what people are confronted with, namely complex and dynamic systems of information exchange. Only metaphors with dynamic and probabilistic (not static) references and connotations might properly grasp knowledge organizations such as internet systems of browsing, chatting, twittering etc. Rather than stable structures (e.g. network metaphor) or complex yet linear architectures (e.g. rhizome metaphor), one ought to consider dynamic and changeable characteristics. For these reasons, it is particularly the probable (statistic) connotations of new metaphoric thinking that should be used in designing future metaphors.

Many theorists and designers of hardware/software tools, which are widely used in information/knowledge systems, often emphasize the *cognitive/intellectual* side of them. “Developers of information systems should consider quantitative aspects of cognition in their designs” (Case, 1991, 657). It is emphasized especially the increasing role of concrete, individual agents, rather than only institutional makers or senders, who browse, receive and utilize information and process it into knowledge. Intellectual abilities such as imagination, classification, categorization and conceptualization become increasingly important and help people to navigate through internet resources and databases. Metaphoric thinking, both in the case of designers and users of information systems, is therefore desired and fruitful since it facilitates proper - cognitively effective, critical and responsible - understanding of complex and obscure phenomena. In particular, the critical ability to recognize what a particular metaphor suggests and simultaneously hides is of special importance.

To properly utilize epistemological potential of the cognitive theory of metaphor one should go beyond treating metaphor as only a means of representing knowledge structure and organization. Metaphors are tools applicable to many practical, not only linguistic endeavors. They may steer and control the users’ attitudes, particularly, their attention when they have a first, spontaneous glance at a bulk of information to be navigated. Persuasive (rhetoric) characteristics of many metaphoric phrases or slogans (based on similes between information and goods) might enhance the performative nature of the same. It might also, however, bring about the negative aspects of metaphors when they induce their users, the compliant ones, to follow them literally. That is why pictorial metaphors (spatial or architectural modes) should be designed and used carefully as they very often motivate agents to wrongly categorize information/knowledge systems and subsequently undertake hasty endeavors. I would like to conclude with the observation that metaphors with dynamic and probabilistic connotations guarantee that the above danger is avoided and promote a more effective and reasonable mapping out of knowledge organization.

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