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SPECULATIONS IN DOCUMENTATION

The rhizome and the tree; changing metaphors for information organisation

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Abstract

Purpose

Reviews Deleuze and Guattari's concept of the rhizome as a model for information organisation.

Methodology

Critical review of selected literature

Findings

The rhizome concept is a promising model for understanding hyperlinked information services. It may be of practical value, particularly if it can be integrated with more traditional forms of information organisation. More research, conceptual and practical, is needed before this can be achieved.

Research limitations

The literature review is not comprehensive, and the conclusions are open-ended.

Originality/value

This is the only paper to review the rhizome concept in this way.

Keywords

Classification; information organisation; world wide web; philosophy

Paper type

Conceptual paper

Introduction

At the heart of the information sciences lies the issue of classification (see, for example, Hjørland 2008, Broughton 2004). At the heart of classification, or knowledge organisation more generally, lies the problem of *how* to organise knowledge; what basic model or epistemology, is to be adopted (see, for example, Hjørland 1998).

For nearly two millennia, this model has been an Aristotelian hierarchical model, of concepts divided into mutually exclusive categories. Recently, this view has been challenged by philosophical argument, and by the brute fact of the World Wide Web. Among various contenders for the status of a new model, the idea of the *rhizome*, propounded by Deleuze and Guattari, seems particularly interesting.

This short article reviews this idea in this context, meeting along the way some pre-web proto-rhizomes, post-modern library users and web searchers, and a good deal of botanical metaphor.

We are, of course, aware of the danger of choosing a single concept from a complex body of philosophical writing, and taking it out of context. Indeed, Jones and Roffe (2009, page 2) give this warning for our specific case, criticising: 'the piecemeal appropriations of Deleuze's concepts within an interdisciplinary field ... where specific notions can be borrowed with little concern for their original context or their relationship to the writer's *oeuvre* more broadly .. this approach is usually mediated via the notations drawn from his later work of the 'rhizome' or the 'nomad'. Frohman (2009) says bluntly that the rhizome concept has been "over-used". We hope the reader will agree that we have minimised, if not entirely avoided, these problems.

The rhizome and the tree

The concept of the *rhizome* in the context of classification, and hence applicable to information organisation, was introduced by Gilles Deleuze and Félix Guattari in a work of that name in 1976, and gained widespread attention from its appearance in the first chapter of their 1987 work *A thousand plateaus*, a wide-ranging philosophical work, itself written in somewhat rhizomatic form. It has been influential across a variety of disciplines, so that Sukovic (2008, page 75) could write "the critique of hierarchical systems that isolate information and impose certain ways of thinking is often related to Deleuze and Guattari, who contrasted rhizomes and trees as metaphors for two different systems".

These authors are generally regarded as working from a post-modern and post-structuralist philosophical perspective (Dervin 1994, Day 2005, Cronin and Meho 2009), though they never recognised such terms. Deleuze is one of a number of leaders of post-modern thought to have been selected for criticism for the misuse of concepts from the physical sciences and mathematics (Sokal and Bricmont 1999); though these critics did not specifically include the rhizome concept in their

condemnation. A summary of other criticisms of Deleuze and Guattari's particular philosophical stance is given by Smith and Protevi (2008). Their thought is in the tradition of Husserl and Bergson, though drawing from many antecedents (Jones and Roffe 2009), and has a close affinity with the ideas of Foucault and of Derrida (Marks 1998, Patton 1996, Smith and Protevi 2008).

The term at issue is, of course, used in a metaphorical sense, which may account for Sokal and Bricmont sparing it from their criticism. A rhizome, according to *Chambers English Dictionary*, is "a rootstock, an underground mass producing roots and leafy shoots". To be more specific, rhizomes are "specialised underground stems, which also serve as storage organs. The main shoot dies at the end of the season and is replaced by one or more lateral buds in a typically sympodial branching pattern. These secondary rhizomes, in turn, produce an arial shoot after a single node, or after many nodes" (Ingram, Vince-Prue and Gregory 2002, p 158). 'Sympodial implies a repeated and irregular branching. The nature of the rhizome then is to form a mass of roots and tubers, all connected into a complex and laterally branching network, of irregular and unpredictable form, with no favoured or principle nodes or linkages. This was the biological model which Deleuze and Guattari took as their metaphor, or 'image of thought' as they termed it, for the nature of information and knowledge. In keeping with their general approach, they did not emphasise clear and exact definition: rather pursuing a helpful metaphor to its maximum, Or, as Frohmann (2009, p. 301) puts it, "forging concepts in a Deleuzian spirit, seeking to enhance their power and force, with more concern for what they do than for what they mean and represent". It is also true to say that the focus of these authors' interest in classification went far beyond library / information matters, in which they exhibited little specific interest, being more concerned with classification in a much broader intellectual, social and political sense.

It seems clear that it was inspired by, and opposed to, the other long-standing biological metaphor in knowledge organisation: the 'tree structure' of the traditional hierarchical classification, which Deleuze and Guattari termed the 'arborescent' model. It is a fundamental intellectual model for much of western thought, stemming originally from Aristotle's 'classic theory of categories', which in essence propounds that entities are placed into the same category, by rational division, according to an objective assessment of shared characteristics (see, for example, Barnes 1995). It has been the basis for scientific classification and taxonomy (for a classic exposition from the nineteenth century, the 'golden age' of scientific classification, see Jevons 1877), and consequently for most bibliographic classification (Langridge 1992, Barite 2000, Taylor 2004, Olson 1999, 2007).

This model is characterised by vertical and fixed linkages, and binary choices, and by the linking of elements only of the same general nature: "linking traits of the same nature" as Deleuze and Guattari put it (1987, page 21). A concept must typically fit into one and only one place in a classification scheme, and the hierarchical divisions must be made by a single criterion, and must be mutually exclusive (Langridge 1992, Olsen 1999). All items with any particular characteristic are distinguished from all others of the same kind. "Tree logic" is therefore "a form of cognition in which

information, ideas, people and institutions are ordered hierarchically according to predecessors and roots ... Thus tree order is an order based on similarity and offers a taxonomy of forms within a category" (Cavenagh 2007, page 44).

It has been recognised that this form of 'pure' classification is difficult, if not impossible, to realise in practice, especially for information organisation. Langridge (1992, page 16) argues that it is "intolerably cumbersome, even for logical purposes [and] any logical prescription must be seen as an ideal rarely attainable in practice". More fundamentally, over the past century, there has been a "chipping away", as Taylor (2004, page 299) puts it, at the Aristotelian principles of exclusive categories and their distinction, by philosophers including Collingwood, Wittgenstein, Austin, Zadeh, Foucault and Rosch: for brief accounts, focused on information implications, see Langridge (1992), Bowker and Star (1999) and Taylor (2004). None, however, produced a fully satisfactory replacement, and an organisation based on the tree metaphor remains central to traditional forms of information organisation, including both enumerative and analytico-synthetic classifications (Taylor 2004, Broughton 2004).

By contrast to the necessary hierarchy and strict categorisation of the tree metaphor, the rhizome concept allows, indeed requires, non-hierarchical linkages, made pragmatically as they are needed, horizontally or across any number of levels, and linking elements of disparate nature when appropriate, crossing categories. It presents a "de-centred network .. allowing immediate connections between any of its points" (Smith and Protevi 2008).

Bogue (1989, page 107) emphasises the extent to which this marks a break with traditional conceptual structures: "a rhizome, as Deleuze and Guattari explain ... is the antithesis of a root-tree structure, or 'arborescence', the structural model which has dominated Western thought from Porphyrian trees, to Linnaean taxonomies, to Chomskyan sentence diagrams' Arborescences are hierarchical, stratified totalities which impose limited and regulated connections between their components. Rhizomes, by contrast, are non-hierarchical, horizontal multiplicities which cannot be subsumed within a unified structure, whose components form random, unregulated networks in which any element may be connected with any other element".

Emphasising the distinctive features of the rhizome metaphor, its originators wrote "Any point of a rhizome can be connected to anything other, and must be. This is very different from the tree or root, which plots a point, fixes an order" (Deleuze and Guattari 1987, page 7), and "Unlike a structure, which is defined by a set of points and positions, with binary relations between the positions, the rhizome is made only of lines .. the rhizome pertains to a map that must be produced, constructed, a map that is always detachable, connectable, reversible, modifiable and has multiple entryways and exits and its own lines of flight" (Deleuze and Guattari 1987, page 21).

Such language deviates considerably from anything that could describe a botanical rhizome, and tends to show why Deleuze' writing has been criticised for being less than clear (Sokal and Bricmont 1999, Smith and Protevi 2008). Nonetheless, we can

see why this concept has an immediate resonance with a hypertextual information system; the rhizome removes any idea of a natural hierarchy, and provides attributes which reflect the non-linear and non-hierarchical hyperlinked environment. The digital hypertext environment has allowed for connections and linkages to be made which are in no way linear and one-dimensional, and which provide the 'lines of flight', and the 'connectable' and 'reversible' entrances and portals which typify the rhizome structure.

This also implies a dynamism of thought and attention. As Goodchild (1996, page 2) wrote: "[an] image of Deleuze and Guattari's theoretical endeavour is nomadism. There is no longer any ultimate goal or direction, but merely a wandering along a multiplicity of lines of flight that lead away from centres of power. Arborescent models of structured thought and activity are replaced by an exploratory rhizome. Any more of thought or social relation is desirable, so long as it does not lead back into an old or new convention, obligation or institution". Perhaps it is not too far-fetched to see an analogy here with some of the observed behaviours of web users (see, for example, Nicholas, Huntington, Williams and Dobrowolski 2004). It has been observed that many such user do not proceed in any obviously rational manner, nor to follow any pre-defined navigational schemes. Rather they seem to follow links at random, frequently return to a starting point, 'skim over the surface' of materials rather than drilling down, and generally display 'rhizome-like' behaviour.

Indeed, although their work was by no means focused on the information sciences, its originators noted the problems of fixed (arborescent) hierarchies in information organisation, even in the pre-web age: "an element only receives information from a higher unit, and only receives a subjective affection along preestablished paths. This is evident in current problems in information science and computer science, which still cling to the oldest modes of thought in that they grant all power to a memory or central organ" (Deleuze and Guattari 1987, page 16).

Applications in the information sciences

Although Deleuze and Guattari are generally counted among the post-modern or post-structuralist 'French theorists' who have influenced the information sciences, their impact seems to be modest. Day (2005, page 597) comments that Deleuze's work "has not been heavily used or addressed in information studies". In confirmation, Cronin and Meho (2009) find Deleuze and Guattari to have been cited in 23 and 14 documents respectively, in the information studies literature. This compares with 123 citations for Bourdieu, 180 for Foucault, and 235 for Latour. Not all of even these relatively few citations to Deleuze and Guattari will have been related to the rhizome concept.

Although the rhizome concept has not been formally accepted as a model for the organisation of information, despite its seemingly clear relevance to a networked hypertextual environment, a number of initiatives along these lines have appeared. Some explicitly cite Deleuze and Guattari as the source of the rhizome metaphor.

Others use the term, but do not cite Deleuze and Guattari, suggesting that the rhizome concept has become a kind of unattributed meme: an example is a software system for creating a wiki system with "a web of relationships between the underlying ideas" (Souzis 2005). O'Sullivan (2009, p. 134) similarly states that the best-known of such systems, Wikipedia, is "a rhizomic structure, a system of nodes and links without a fixed centre or underlying hierarchical pattern".

The influence of the rhizome has been felt across a wide range of the library / information sciences, including particularly the narrative structure of children's literature (Mobius 2006, Burnett and Dresang 1999), but also the design of hypertext materials (Burnett 1993) and of e-learning materials (Cousin 2005), and the classification of knowledge in general (Santoro 2003, Cavanagh 2007). The last has led to the bold claim that the rhizome approach is the best form of classification for the modern world (Santoro 2003). It has also been suggested that "the rhizomorphic model of information contexts better accounts for both the richness and the chaos encountered in seeking information" (Burnett and McKinley 1998, p. 294).

In the area of bibliographic classification, the best known deviation from the Aristotelian model has been the work of Hope Olson. Arguing that "the presumption of mutually exclusive categories is as dangerous for us [information specialists] as for the broader social fabric of which we are an integral part" (Olson 1999, p. 67), and that mainstream hierarchical classifications tend to marginalise and exclude certain knowledge domains, Olson has sought "a way of linking the margins and the centre to create a sort of network or web" (Olson 1998, page 241). This has been realised in practice, for the feminist domain, by mapping the specialised terminology of a Women's Thesaurus onto the concepts in the Dewey Decimal Classification. This creates a system of intersections and paths, different from those in the mainstream classification, and hence creating a new network of meaning (Olson 1998, Olson and Ward 1998); very much a 'rhizome approach'.

The rhizome and the web

The non-hierarchical and networked nature of the rhizome seem so closely matched to the web environment that it is tempting almost to equate the two. As Seto (2006, p. 1) puts it, "each item (web page) is a node of the rhizome and has the potential to be linked to infinite numbers of other nodes". But, in fact, information visionaries have been propounding 'rhizome-like' information solutions well before the web, and indeed Deleuze and Guattari's rhizome, was conceived. Two such images date back to the 1940s. Seto (2006) points out that Jorge Luis Borges' *Library of Babel*, with its labyrinth of nodes and connections (Borges 2000), is a distinctly rhizomal creation, while Sukovic (2008) reminds us that Vannevar Bush's seminal *Memex* idea, with its intricate web of trails of association (Bush 1945), also has rhizomal properties.

Giving a philosophical appreciation of the applicability of the concept to cyberspace, at an early point in the development of the Internet, and before the emergence of the web, Stivale (1988, p. 71) contended "I consider the recent development of

interchanges in cyberspace as one approach for comprehending Deleuze and Guattari's provocative conceptual model of the 'rhizome' ".

More recently, Conley (2009) has shown considerable similarity, but also some differences, between the rhizome and the nature of computer networks generally, while Buchanan (2009) present a similar analysis for the specific case of the World Wide Web. Interestingly, the latter suggests that the rhizome concept may more fully parallel William Gibson's original pre-web concept of cyberspace (1984), than with the actuality of the web which approximates it. Gibson's cyberspace was effectively infinite in scope, and unlimited in the extent and nature of connections which could be made within it; the web is, in practice, much circumscribed by practicality.

However, it is with the development of the web as we know it that the value of the rhizome concept can be fully considered, both as a way of understanding this new information environment and, consequently, as a framework for understanding knowledge organisation generally. Many authors have considered the changes to knowledge organisation promoted, or even enforced, in the web environment; we will represent them with the views of one of the most long-standing of internet commentators and critics, Hubert Dreyfus (2009).

Dreyfus asserts that the hyperlinked nature of the web does not stem from any assessment that this is a better way to find information than the old systematic order of the library; rather it is simply the natural and simple way to use the available technology. But "when everything can be linked to everything else without regard for purpose or meaning, the vast size of the Web and arbitrariness of the links make it extremely difficult for people desiring specific information to find the information they seek" (Dreyfus 2009, p. 11). The rhizome is casting a dark shadow, although Dreyfus does not cite Deleuze and Guattari directly. The Aristotelian structure of information organisation has dissolved, replaced by something more amorphous, if more creative. This may, Dreyfus points out, have some advantages. In the Aristotelian mode, someone interested in tortoises must first commit to an interest in animals, and follow the structure down. Almost certainly, there will be no easy way to 'cut across' to the infinity paradoxes of the tortoise and the hare. However, with information organised on the web in rhizome fashion with multiple horizontal hyperlinks, the principle, rather than that of a class and its members, becomes one of the inter-connectness of all the elements in the web, or rhizome, each being available within a few clicks of any point. From information on tortoises as animals, a single horizontal link can take us to Zeno's paradox.

It might at this point be objected that traditional library organisation has tools to achieve this. Mainstream classifications typically have a relative index, to point to all the occurrences of a subject, such as a tortoise, in whatever places in the scheme they occur, while subject classifications such as the Brown Scheme as well as the many 'folk classifications' (Broughton 2004), with their modern incarnation as folksonomies, achieve this task in their different ways. While this is true, Dreyfus

points up clearly the major distinction between the traditional and the rhizome approaches to organising information.

He goes further, some might say too far, in asserting that 'clearly, the user of a hyper-connected (read rhizomal) library would no longer be a modern subject with affixed identity who desires a more complete and reliable model of the world, but rather a postmodern, protean being ready to be opened up to ever new horizons. Such a new being is not interested in *collecting* what is *significant* but in *connecting to as wide a web of information as possible* (Dreyfus 2009, p. 12, original author's italics). While rather polemic in nature, this does remind us of the postmodern roots of the rhizome concept, and raises the questions of what we might be committing to in embracing the rhizome approach as the best approach to knowledge organisation in the modern context. We might conclude with Cavanagh (2007, p. 45) that "it is as if all knowledge were disordered and a new order emerges, not from the decisions of library committees, scholars or other credentialised information experts, to order it in some way, but from the activities of those who use it and make their own connections. Thus rhizomes are inherently heterogeneous, bringing together and juxtaposing elements from all social and intellectual locations". [A referee has suggested that this notion of the rhizomal library risks throwing the Enlightenment baby out with the bathwater; we tend to agree.]

In reflecting on this, we might consider the comments of Liu, quoted by Sukovic (2008), who brings a note of reality to the hype of open and non-hierarchical information systems: "while knowledge workers may vote for rhizomic democracy in principle, they also want firewalls for their personal computers: and they kill Bermuda grass on their lawns" (Liu 2004, pp. 374-375). And we may also remember that traditional hierarchical models for information organisation have proved very effective over the centuries.

Dreyfus (2009, p. 13) provides an illuminating insight in a table, in which he contrasts 'old library culture' with 'hyperlinked (or rhizome) culture', thus:

OLD LIBRARY CULTURE

Classification

stable
hierarchically organised
defined by specific interests

Careful selection

quality of editions
authenticity of the text
eliminate old material

Permanent collections

preservation of a fixed text
interested browsing

HYPERLINKED CULTURE

Diversification

flexible
single level
showing all possible associations

Access to everything

inclusiveness of editions
availability of texts
save everything

Dynamic collections

intertextual evolution
playful surfing

While at first sight this is simply a juxtaposition and comparison of opposing alternatives, the table also shows the potential for combining and linking the two, somewhat in the manner shown in practice by Olson. Perhaps the rhizome and Aristotle may be able to co-exist.

Sukovic reaches this conclusion in her analysis of information seeking and discovery in the humanities, under the heading 'root or rhizome': "the need for associative ability and flexibility of the network, as well as the need for some control and structure suggest that both root-like and rhizomic structures have some advantages. Very importantly, they are not mutually exclusive" (Sukovic 2008, p. 83). She points out that Deleuze and Guattari point out that a rhizome could be entered from a main tree root. This means that practical information systems may use the two models in a complementary way: "an information system can follow the arborescent structure of the natural lemon tree as well as the rhizomatic structure of an imaginary red-leaved plant on which blue lemons grow. These two structures complement each other or be exchanged as required."

Conclusions

We have seen that the rhizome metaphor offers an interesting model for hyperlinked information systems, to the extent that some commentators believe that it is the optimal model for information organisation in the modern context, and specifically in the context of the web. We have also seen that there are limitations to the validity and effectiveness of systems organised according to this metaphor. It is also unclear to what extent the rhizome idea is capable of development into a conceptual model which can underlie the practice of information organisation, as the tree principle has done for millennia, or even into a model with genuine explanatory, or even predictive, capability.

The prospect of linking together non-hierarchical and traditional systems - the rhizome and the tree - seems on the face of it to be a promising objective for the practical situation. We should perhaps be concerned, however, that we are 'bolting together' concepts from very difficult philosophical backgrounds – perhaps even inadvertently trying to integrate realist and non-realist positions for the information sciences, usually taken as incompatible opposites (Hjørland 2004). This is not a task to be undertaken lightly, to say the least. Before the rhizome concept can be absorbed as a standard model for understanding information organisation, and other aspects of the information sciences, much more study, both of its philosophical basis and practical applicability, will be needed.

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