3
Reconsidering the Rhizome: A Textual Analysis of Web Search Engines as Gatekeepers of the Internet

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Summary Critical theorists have often drawn from Deleuze and Guattari's notion of the rhizome when discussing the potential of the Internet. While the Internet may structurally appear as a rhizome, its day-to-day usage by millions via search engines precludes experiencing the random interconnectedness and potential democratizing function. Through a textual analysis of four search engines, I argue that Web searching has grown hierarchies, or "trees," that organize data in tracts of knowledge and place users in marketing niches rather than assist in the development of new knowledge.

3.1 Introduction

As connections to the Internet appear more frequently as household commodities, their placement within the democratic order has become prized. Belief in the Internet's potential to radically alter the landscape of communication and democracy spread quickly through early literature about cyberspace. While some were hesitant to give the Web such power, others saw a redefinition of identity, voice, and politics. Within this body of literature, the label of "rhizome," following Deleuze and Guattari, was attached to the Web, noting its limitless expansion, random intersecting points, and abilities of rupture and re-growth. In an analysis of the more mainstream Web search engines, this chapter will question the Deleuzean notion of the rhizome as an apt metaphor for the Internet. I argue that due to the commercialization and gatekeeping functions of major Web search engines, including Google, Yahoo!, and MSN Search, the original structure of Web discourses, dissemination, and resistance has been co-opted. The consequences of the ordering of knowledge and its dissemination are threefold. First, the connections between individuals in the fight against hegemonic practices have been mitigated by the commercial restructuring of the Internet. Second, in the personalization of the digital sphere, specifically through the use of "cookies" and other digital devices, the user becomes prescribed in their experiences, which limits his or her ability to expand into new areas of learning. Finally, search engines utilize hierarchies to order knowledge and information which privileges

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mainstream and silences marginalized voices. Thus, what was once considered a tool for limitless knowledge and information becomes a commercial filter of packaged and priced data.

3.1.1 The Internet and the Promise of Democracy

Early theory in regard to the Internet came with great hope and promise. The medium was approached as a panacea to many of the perils of modernity. From theories of the virtual community to hacktivism to the rhizome, scholars approached the medium with varied scholarly hopes and fears. Of most importance for this chapter is the concept of the rhizome from critical theorists Gilles Deleuze and Félix Guattari. This rethinking of knowledge has been often used to describe the structure and capability of the Internet.[1] Before introducing the concept of the rhizome, I will first explore discussions of the potential of the Internet as it blossomed in the late 20th century.

Rheingold's Virtual Communities

Howard Rheingold (2000) approached the Internet as a reconceptualization of the very idea of community, remarking that the Internet has changed "the way groups of people are using CMC (computer mediated communication) to rediscover the power of cooperation, turning cooperation into a game, a way of life – a merger of knowledge capital, social capital, and communion" (p. 109). This virtual community has fostered the connection of individuals from myriad spectrums of life, including their competing interests and ideologies.

> Because we cannot see one another in cyberspace, gender, age, national origin, and physical appearance are not apparent unless a person wants to make such characteristics public. People whose physical handicaps make it difficult to form new friendships find that virtual communities treat them as they always wanted to be treated – as thinkers and transmitters of ideas and feeling beings, not carnal vessels with a certain appearance and way of thinking and talking (or not walking and not talking). (Rheingold 1993: 11)

Rheingold's earliest text (1993), and its subsequent revision (2000), follow his tales on the Internet while involved with an early online community, the Whole Earth 'Lectronic Link (WELL). He believes that cyberspace had the ability to "change our experience of the real world as individuals and communities" (p. xviii).

[1] It is important to note that I am approaching the theories of the Internet with a wide scope which will include theorists and areas of critical theory that have vastly different theories of epistemology (i.e. Habermas and Deleuze). While cognizant of this, my purpose here is, rather, to highlight the array of approaches to the Internet.

The WELL provided, for him, an experience of connection with other users across the globe. His anecdotes provide insight into the potential connections to be made with screen names found in multiple user domains (MUDs) and Internet Relay Chat (IRC). Rheingold's work has become known as groundbreaking in the area of theorizing about the net (Mater 2001; Resnick 1998) and has contributed, in part, to the development of a vast array of scholarly work regarding the potential of online communities.

Digital Political Activism

Parallel to Rheingold, many other theorists approach the Internet looking for the panacea to an ailing democratic order. Following the work of Jürgen Habermas, public sphere and counterpublic theorists have approached the Internet with both hope and hesitation for its potential, acknowledging the capacity of the Internet to alter the functions of democracy (Buchstein 1997; McDorman 2001; Owens and Palmer 2003; Palczewski 2001; Resnick 1998; Roper 1998; Streck 1998). At a national level, the ability for counterpublic actors to utilize new communication technology (NCT) can foster mobilization through virtual meetings and regroupings after political loss (McDorman 2001). Similarly, and on a global level, Mater (2001) argues that the increased use in new communication technology can result in "the emergence of a truly global public sphere involving all interested actors in the discussions of actions that need to be taken with regard to important global political, economic, and social problems" (p. 228). The public sphere, according to a variety of authors, becomes revitalized and invites democratic participation through the digital convergence of online actors. Additionally, new digital political arenas also invite new types of digital resistance. Hackers and hacktivism "organize 'virtual sit-ins' and recruit computer programmers to attack the World Wide Web sites of any person or company they deem responsible for oppression" (Harmon 1998 p. A1), such as those organized by Ricardo Dominguez and Stefan Wray. Hackers and hacktivists utilize mixed media and cyber resistance (Thomas 2005) to "imaginatively ally technology-based techniques with traditional and indigenous cultural resources" (Taylor 2005: 644). These uses of the Internet as a liberatory and oppositional medium highlight the democratic potential to splinter dominant ideologies.

3.1.2 The Rhizome

The above scholarship highlights the various approaches to the development of democracy within digital frameworks. While relevant to the discussion here, of more importance is the consideration of the Internet as a rhizome, specifically in the Deleuzean sense of the concept. Deleuze and Guattari (1987) introduce the concept of the rhizome as a rethinking of knowledge. Western epistemology has

long relied on the metaphor of the tree, locating a unity of knowledge in primary systems of linguistics, psychoanalysis, and theology. Deleuze and Guattari (1987) argue that arborescent thought results in "binary logic and biunivocal relationships (which) still dominate psychoanalysis…, linguistics, structuralism, and even information science" (p. 5). The tree metaphor notes that at the origin of philosophic thought lies a base structure or root. For example, all languages can be traced back to an original *ur*-language. "In contradistinction to arborescent thought, rhizomatics intends to uproot philosophical trees and their first principles to deconstruct binary logic" (Best and Kellner 1991: 99). The metaphoric image of the rhizome, rather than finding a unity or beginning for knowledge, is an overlapping and intersecting system. Deleuze and Guattari (1987) argue that nature does not follow the arborescent system: "in nature, roots are taproots with a more multiple, lateral, and circular system of ramification, rather than a dichotomous one" (5). Thus, rhizomes are never beginning and never ending "non-hierarchical systems of deterrorialized lines that connect with other lines in random, unregulated relationships" (Best and Kellner 1991: 99). The concept of the rhizome has six principles which guide Deleuze and Guattari's discussion of the relationship of the metaphor to their critical project: connection, heterogeneity, multiplicity, asignifying rupture, cartography and decalcomania.

The principle of *connection* notes that "any point of a rhizome can be connected to anything other, and must be" (Deleuze and Guattari 1987: 7). The connections between nodes on a rhizome are also random in their relationship to each other which embodies the notion of *heterogeneity*, whereas arborescent structures are distinct from each other and homogenous within each tree. "A rhizome ceaselessly establishes connections between semiotic chains, organizations of power, and circumstances relative to the arts, sciences, and social struggles" (p. 7). The principle of *multiplicity* notes that: "it is only when the multiple is effectively treated as a substantive, 'multiplicity,' which it ceases to have any relation to the One as subject or object, natural or spiritual reality, image and world. Multiplicities are rhizomatic, and expose arborescent pseudomultiplicities for what they are" (p. 8). When a rhizome is broken or *ruptured*, it can still function within its remaining structure or can create new lines of growth from the ruptured area. Finally, the principles of *cartography* and *decalcomania* argue that the rhizome exists as a map and not a tracing. The structure of the tree is a self replicating and homogenous metaphor where the leaves of the tree recreate the same structure as the root. Thus, the tree grows by tracing its previous structure. The rhizome, in contrast, is a map. "A map has multiple entryways, as opposed to the tracing, which always comes back 'to the same.' The map has to do with performance, whereas the tracing always involves an alleged 'competence' " (p. 12–13). The concept is much more complex than the brief introduction here, and I will return to its implications following my analysis. However, it is important to note the central principles of the rhizome and its re-ordering of philosophic thought and knowledge. Rather than a unifying and guiding origin, rhizomatics decenter any privileging or hierarching of unity or Oneness.

Connecting Rhizomatics to Cyberspace

Critical theorists approaching the Internet have adopted the metaphor of the rhizome to approach the changing digital landscape.[2] Following these theorists, four overlapping themes emerge from the literature: structure, hypertext, epistemology, and resistance. First, on a basic level of the argument, the structure of the Internet mirrors Deleuze and Guattari's (1987) descriptions of the rhizome. "A rhizome as a subterranean stem is absolutely different from roots or radicles. Bulbs and tubers are rhizomes. Plants with roots or radicles may be rhizomorphic in other respects altogether…even some animals are, in their pack form. Rats are rhizomes" (p. 6). Van der Klei (2002) argues that, "In browsing the Web, one finds elements to be linked, in a nascent rhizome" (p. 48). The interconnectedness of the links of Web space captures the overlapping structure and limitless heterogeneity of the rhizome. A user can enter and exit from any point of the Internet and find these connections. "Computers on the Internet, using packet switching, send information to any neighboring computer on the Internet along routes that may or may not have been pre-established" (Hamman 1996). Indeed the structure of the early Internet, ARPANET, especially its military applications, was designed to sustain a possible rupture. In discussing the nature of using the Internet, the culture of cyberspace is also couched in terms of the rhizome. Lemos (1996) describes cyberculture as a self-organizing virtual space, "a sort of plateau, a 'rhizome' where the interconnections and multiplicities even change the nature of the media such that it metamorphoses into a medium of contact" (p. 46). In short, the structural level of the metaphor indicates that the Web-like nature of the Internet is much like the rhizome, which is difficult to dispute. The Internet does have multiple entry points and each one connects to many others. However, while structural arguments are sound, the experience of the Internet from a user perspective may not follow the rhizomatic image.

The second theme found in the literature discusses the nature of writing in cyberspace, specifically, the use of hypertext. Hypertext refers the linking of pages through various pathways which are written by the Web author, but chosen by the user. It is "a form of electronic text, a radically new information technology, and a mode of publication" (Landow 2006: 2). The use of this language style has been compared to the rhizome for its ability to decenter the text from a point of origin and the multiplicity of variously authored texts found in each work through the linking structure. The connection of the basic structure of the Web and hypertext is notable: "The hypertextual organization of the World Wide Web turns it into an instantiation of the concept of the rhizome whose defining attributes bear a strong affinity with those inherent in the structure of the Web" (Calleja and Schwager 2004: 7). From the linguistic organization (or lack thereof) found in cyberspace, the user becomes enmeshed in an environment which defies the use of linear logic and binary thinking.

[2] See Streck (1998), Moulthrop (1994) and Brande (1996) for counterarguments and reservations about applying rhizomatic theory to the Internet.

The connections found in the hypertext assist in the branching of the thought process and act in a similar manner as the performance and map argument articulated by Deleuze and Guattari (Landow 2006). The user, in the ideal hypertext, interacts by *becoming with* the text rather than overcoming or completing it.

From the interaction with hypertext, the third theme of epistemology appears. If users of the Internet engage with hypertext and its random interconnectedness, the function of the brain and use of knowledge is fundamentally different than arborescent thought. "Thus the developing episteme underlying these concerns revolves around the way these technologies of inscription are changing from linear to non-linear prosthetic extensions of thought. The gateway into exploration of the non-linear aspect of digitality can be most profitably explored through theories of hypertextuality" (Calleja and Schwager 2004: 9). In other words, brain functions follow the technology they use. If a society continues to engage with hypertextual environments, the human brain will follow in its organization. Similarly, Moulthrop (1991) sees the steps in the digital revolution as a cultural step away from the arborescent toward "a new information ecology in which the hothouse walls will come down and strange new growths will spring up across the land" (p. 255). Additionally, many authors have argued that the very identity of the hypertextual user becomes altered when on the Internet. Its use can destabilize identity (Markley 1996); or we become desiring machines (Shields 1996) or "turns us into part of the rhizome itself" (Calleja and Schwager 2004: 7). These new bodies or minds on the Internet are enabled to resist the dominant power structures and destabilize oppressive forces.

The final theme in the literature notes the use, both in theory and practice, of the Internet as a form of resistance. Again, the overlap of these themes becomes apparent as the use of hypertext and the epistemology both connect with the theory of digital resistance. Rosenberg (1994) sees the epistemology of nonlinear thinking as central to social expression and potential.

> The nomad and rhizome as concepts articulating the contingent condition of 'becoming' that enables resistance to domination. Hypertext theorists draw on these same topical oppositions to conceptualize this fuzzy micropolitical realm between determination and freedom, particularly those theorists who associate hypertext with the avant-garde thrust – the 'leading edge' in art and education. (Rosenberg 1994: 272)

Similarly, Moulthrop (1994) connects the use of both hypertext and its beneficial epistemology as able to change the nature of dominance and resistance. "Hypertext and hypermedia represent the expression of the rhizome in the social space of writing. If so, they might indeed belong in our dreams of a new culture…hypertext provides a laboratory or site of origin for a smoothly structured, nomadic alternative to the discursive space of late capitalism" (p. 304). While these theories offer the means to fight back, others have enacted the resistance through online protest and activism, similar to the hacktivists discussed above. Stefan Wray participated in the aforementioned Zapatista movement through acts of online civil disobedience. In writing about rhizomatics and resistance, Wray (1998) notes that "This movement of information through these various cyber-nets of resistance can be said to have occurred rhizomatically, moving horizontally, non-linearly, and underground." In

sum, resistance from the oppressive structures of modernity is fostered through the becoming-rhizome and structural interconnectedness of the Web.

The above theorists contend that the function and use of the Internet follows the Deleuzean notion of the rhizome. From each of the four themes found in the literature, connections to the rhizomatic structure of the Internet are foundational to the ability to theorize and enact change and resistance. However, in the descriptions of hypertext or Web space, few, if any, include the primary gateway into the Internet from a user perspective: the search engine. In response to this consideration, I offer this chapter as a phenomenological perspective regarding the daily use of the Internet. Where Wray (1998) and Palczewski (2001) note exceptional examples of online civil disobedience and hacktivism, I offer a more quotidian approach to the Internet. Felix (2006) informs us that on a typical day, 60 million adults use Internet search engines, usually Google, Yahoo!, and MSN Search. Taking into consideration the predominant usage of the Internet, then, I contend that users of the Internet are taken through tracts of knowledge rather than connecting through random intersecting points of the rhizome. In short, the rhizome has grown trees.

3.2 Method

To support this argument, I will analyze a set of search engines using a textual analysis including a discussion regarding the software behind the engine. In undergoing this analysis, I am keeping in mind a phenomenological attitude where my experience of the Website guides my understanding of their abilities to structure the Internet. Rather than engaging the Web with a cyberactivist attitude, I approach it with a frame of mind that embodies the average user. Much of the aforementioned literature sees the Internet for its possibility, and while a valid and important approach, I believe the Internet should also be recognized for its daily and predominant usage. Thus, in my analysis, I will discuss the most popular search engine Websites, Google, Yahoo! Search, and MSN Search as well as Amazon's shopping features. In my discussion of each engine, I will include details regarding their structure and function. Specifically, I will argue that through their algorithms, use of cookies, and hierarchical structure of the search engine results, users are placed the on tracts of knowledge. Thus, instead of the interconnectedness of the rhizome, where people interact in "a merger of knowledge capital, social capital, and communion" (Rheingold 2000: 109), the Internet becomes a place where the user becomes increasingly ingrained in their experience.

3.3 Analysis

Each of the three Web search engines is similar to the others in their construction and layout. Major differences are in style, algorithm, and extent of database. This analysis will track each of the three Websites (Google, Yahoo!, MSN) through a

textual analysis of their display and search functions, their algorithms, and the use of cookies within their browsing functions. Additionally, under the heading of cookies, I will augment my analysis by examining the popular shopping site Amazon.com. Finally, while Web searching offers an expansive amount of information to the individual, the cooptation from corporate commercial activities, especially in the strategic placement of advertising, has altered the Internet's ability to promise a new type of deliberative democracy. In all, the analysis will follow the search process in a step-by-step method to highlight the actual use of search engines: approaching the engine (style and layout), searching (the algorithm), and developing a personal history of searching (cookies).

3.3.1 Style and Layout

The basic layout of search engines presents the user with a predetermined path which inherently limits the nature and number of connections to other individuals. While giving the façade of infinite choices and access, these options merely become leaves on the corporate tree. In approaching each of the three engines, the user will be faced with different layouts and paths; however, each becomes its own isolated group which dare not interact with its competitors. Both Yahoo! and MSN use colorful displays that offer the user a vast array of choices. Before the search has even begun, both sites offer information regarding the latest headlines, special offers from major commercial vendors, and company products, such as chat software and email accounts. Google, by contrast, is simple in its front page, displaying its search area prominently. The text surrounding the search area offers similar products and services, such as company products and advertising information. In the case of MSN and Yahoo!, these front pages offer key gateways into the Internet before the user begins searching. Notably, they begin the tract of knowledge where the user is given categories to guide their search process, such as Yahoo!'s "HotJobs," "Yellow Pages," and "Geocities." These categories begin the user in a direction which keeps them within the Yahoo! knowledge area. For example, a user seeking to join political organizations may approach Yahoo! to seek such information and find the category "Groups" as a place to start. In doing so, however, he or she may limit their interaction solely to other Yahoo! subscribers. Similarly, a user seeking to voice their experiences and opinions may approach MSN's "Spaces" feature, which is similar to a Weblog. Again, while this may provide the Web space necessary to write, it is mediated by the interaction with other MSN related sites and individuals. While the user can distantly interact with people, those people are simply other leaves on the same Yahoo! or MSN tree.

On a similar note to the corporate control over connectivity to other users within home pages, all three search engines frequently and persistently feature advertising within their front pages and search functions. First, Yahoo! displays to users advertising prominently within its front page which often include flashy graphics and sound to entice the casual Web surfer. Companies, such as Dell, American Express,

and Ford, have been featured as sponsors of the site. When searching for items through the engine, the results are littered with advertisements, affectionately called "sponsor results," above the actual search return and in a separate column on the right side of the screen. Unfamiliar or inexperienced users may click on these links believing them to be the information requested. Additionally, the difference of the two searches is notable. In my search of the word "computer," the sponsored results included companies such as Dell, Hewlett-Packard, and Toshiba. In the actual search results, Websites included CNET.com, PC World, and ZDNet.com. Arguably, the actual search results can be considered similar in form to the sponsored results; however, on closer inspection, Websites such as CNET.com and PC World are consumer report style magazines which offer customers a wide array of choices of products other than their own. This corporate influence over search engines inherently limits the type and origin of knowledge as users seek out information over the Internet.

MSN and Yahoo! have similar advertising layouts on their search and front pages; however, again, Google's advertising is prominent only after a search is performed. MSN, on its front page, offers links and flashy advertising for an assortment of companies, including Wirefly, Circuit City, and Target. While not as prominent and colorful as Yahoo!, these advertisements are mixed with its search categories in the overall structure of the homepage, giving the appearance that they lead to information rather than product placement. Upon searching for the above search term of "computer," similar results are found to Yahoo!'s advertising, such as Dell and Toshiba. One difference, however, is in the actual results which reference the IEEE Society and Webopedia.com. Google, as argued above, is much different. The initial front page features relatively no advertising outside of Google services. Nevertheless, as the user searches, the results are surrounded by advertising, coincidently Dell, Hewlett-Packard, and Toshiba again appear as sponsored links.

If Web searching dominates the quotidian experiences of Internet behaviors, users are bombarded with advertising and corporate interests. While a comprehensive and quantitative survey of search terms, which could provide more generalizable claims, has not been conducted here, the above analysis sees that the inherent layout of the Web search engine privileges the Web space which has corporate backing rather than the individual. Other conducted searches which would not link to expected corporate sponsors are still featured in the side columns of sponsored links. Thus, the layout of search engines reflects a larger political economy of the Internet. While the digital access divide has been closing (Marriott 2006), the massive corporate control of information recreates the divide by controlling the *type* of information that users find. The Rheingold days of interacting with random users in Multiple User Domains and Internet Relay Chat have been overrun with the Web browser, which allows for marketing information through pop-up ads, sponsored Web links, and corporate self-promotion. The stylistic features of the Web, combined with a hierarchical structure which privileges corporate sponsorship over actual results of the search, create a façade of open and infinite access while only constraining the user to a limited knowledge base.

3.3.2 The Algorithm

Each search engine contains a software algorithm which sorts Webpages in its database and presents an order of return to the user after conducting a search. Inherently, the algorithms are designed to hierarchize data for the user, indicating which pages are more important than others. While style and layout indicate how the viewer receives the results of their search, the algorithm decides which data is most relevant to the search terms provided. While each search engine company hails its own algorithm, the similarities between the three are striking. MSN Search's algorithm "analyzes factors such as Web page content, the number and quality of Websites that link to (pages), and the relevance of (a) Website's content to keywords " ("Site owner help" 2006). Similarly, Yahoo! details their search algorithm process as a combination of Web crawling and indexing: "Web Results are generated from the billions of Web pages discovered, crawled, reviewed, submitted, or otherwise included in the Yahoo! Search index. More than 99% of Web pages in the Yahoo! Search index are included for free through Yahoo!'s Web crawl process" ("Yahoo! help" 2006). In addition to the basic crawling process, Yahoo! also offers a "Content Acquisition Program." This service offers Website owners, for a fee, the ability to feed content into Yahoo!'s database to facilitate searches for their site. While Yahoo! contends that the service does not guarantee placement, it arguably gives an advantage to Web masters with corporate backing and extra cash. On the whole, when combined with the layout of sponsored results, the political economy of search engines favors those with more money by placing them at the top of search results.

Google's PageRank technology is described as relying "on the uniquely democratic nature of the Web by using its vast link structure as an indicator of an individual page's value" ("Google technology" 2004). Along with a description of PageRank, Google offers an integrity statement which informs the user that their automated system is difficult to be tampered with by humans and cannot be bought into. While on the surface this may seem to be a "uniquely democratic " space, the ranking system highlights and decides "important" Websites and affords those sites with better votes for other sites. For example, if Amazon.com is considered an important Website and links to one of its product's homepages (and vice versa), each company's site receives an additional vote as important. As a result, established Web pages are privileged over infrequently visited pages. Combined with Google's "I'm Feeling Lucky" button and prefetching features, users are encouraged to utilize the primary return rather than explore further in the results. The "I'm Feeling Lucky" button sends users directly to the first page in the list and bypasses the search results. Pre-fetching is a service using Mozilla's FireFox browser which automatically begins downloading the first site returned on the search results. As Web surfers build habits in their searching, they are pushed toward using the top returned item in the search by the inherent layout and nature of the algorithm. Given the massive search returns which are impossible to navigate, the hierarchy of data becomes strengthened from the top to bottom. The first page of returns, through these services and inherent layout of the return page, will be valued far more than the second. The final page of returns will rarely be viewed.

Individual users have overcome Google's automated system by exploiting its algorithm in a process known as "Google Bombing." If pages are ranked by both content and the number of links to a specific site, then individuals can flood the links to search terms by adding anchor texts to their own sites. For example, the search term "failure" yields George W. Bush's biography from the White House Website. This is done by other individual sites connecting the URL of the biography to the word "failure" on their site. If the process is repeated by many sites (predominantly Weblogs), Google's crawler picks up on the consistent linking and accordingly ranks the search for failure in connection to the White House ("Google Bomb" 2006). The use of Google Bombs can be interpreted in two ways. First, Google Bombs can be considered a type of humorous activism, and have been effectively used in such a manner. More importantly and second, however, Google Bombs denote the failure of the objective automated algorithm of PageRank. If the system has the means of yielding false returns from searches, its claim to objective (absent of human interference) hierarchies is questionable.

The search algorithms for each of the above engines highlight multiple problems for the notion of a rhizomatic Internet. While the most obvious argument against their rhizomatic construction is the displayed results in the form of a hierarchy of data, their arboreal nature is more intricate than that. First, all of the algorithms use established pages as a tool for hierarchizing their data. As new pages are built on the Internet, the interaction between them is limited to the connection to established sites. As Internet usage continues, popular sites maintain their popularity. In other words, they become the roots for the tree which stems out in the form of hyperlinks. Second, commercial interests, with their ability to pay into services and sponsored results, are also inherently privileged in the search. This recreates the digital divide from the angle of production, where purchasing power dictates the access to personal sites. The commercially sponsored sites are more able to become the roots for other sites and dictate their construction. Finally, the promise of unbiased algorithms devoid of human corruption falls short through their ability to be manipulated. Through the exploitation of hypertext structures, search terms can provide false and politically motivated results. While promising for activism in subverting the hierarchies, the failure of software systems questions the supposed efficacy of the engine.

3.3.3 The Cookie

As software technology progressed, Web searching has included the use of the "cookie " as a means of tracking the user through their searches. Google, in their privacy policies, describes cookies as

> a small file containing a string of characters that is sent to your computer when you visit a Website. We use cookies to improve the quality of our service and to better understand how people interact with us. Google does this by storing user preferences in cookies and by tracking user trends and patterns of how people search. Most browsers are initially set up to accept cookies. ("Google Privacy Center" 2005)

The use of cookies allows search engines to track current search information in order to provide similar future searches. While the process of cookie information gathering seems invisible to the user, there are times when the cookie becomes more apparent. For example, Amazon.com uses cookies to track the types of purchases made by the user. Using two different Web browsers, Mozilla's FireFox and Microsoft's Internet Explorer, I traced the differences between visits to the Amazon.com homepage. In my initial visit with cookies enabled using FireFox, I was given a set of recommendations for purchases, including books by authors I had purchased in the past including Deleuze, Guattari, and Walter Lippmann. Conversely, using Internet Explorer, the opening page at Amazon.com highlighted purchases from various categories including women's apparel, iPods, and cellular phones. Between the two browsers, not a single product or recommendation was the same. Additionally, Amazon.com recommends specific products to the recognized user and also offers special deals in the form of the "Gold Box." The Gold Box offers a time-constrained additional discount to the user. In order to activate this feature, the user must sign in with an email address and relevant information, including name and birthday. In investigating the Gold Box with and without cookies enabled, the non-cookie browser yielded broad results without specific markings of preference, including popular books, software, and films on DVD. In the cookie enabled Gold Box, however, the results provided products suitable to my political leaning, leisure activities, and professional interests. While this analysis seems to simply highlight my shopping preferences, given that Amazon.com is the largest online retailer for literature, the ramifications for knowledge production become increasingly lucid.

Cookies, being that they invisibly exist in the background of the search, are arguably the most detrimental to the rhizome. As users seek out information, their browser settings become trained to produce results which are already attractive. If I seek out new knowledge and information to purchase from Amazon.com, I am less likely to be presented with philosophies or arguments about the world which challenge my existing belief structure. As will be discussed further, the Deleuzean notion of interference is critical to the production of knowledge. Being presented with competing interpretations and views allows the rhizome to grow in new directions. Rather than the growth of rhizomes, cookies create tracts in which the user will continue to progress through the Web. Much like the hierarchies of information with sponsorships resting on top, this knowledge tract keeps the user confined within a set of experiences and interactions. The cookie will gather data regarding literature and relevant searches and in turn produce similar results. The more often I click on Wikipedia or CNN.com, the more often that Webpage will be higher on my results. In other words, the more I search, the more limiting and defined my searching becomes. Upon reaching the massive and intersecting connections of the Internet, the user plants a seed in the form of the cookie, which grows over time to become their personal tree. While hypertextual environments continue to carry the structural features of the rhizome, where one text can link to the other in random and intersecting ways, these intersecting points begin on one plane or tree.

3.4 Implications

In their original writings regarding the rhizome and subsequent discussions of the nature of philosophy and knowledge, Deleuze and Guattari (1987) conceptualize the human brain as rhizomatic. They argue that knowledge and philosophy has remained entranced with trees. "We're tired of trees. We should stop believing in trees, roots, and radicles. They've made us suffer too much. All of arborescent culture is founded on them, from biology to linguistics" (p.15). Instead, the rhizome offers a way of approaching knowledge and the mind as possibility and potential. Schuh and Cunningham (2004) engage the notion of the rhizome as a metaphor of the mind which "prompts us to seek relationships where a researcher may typically assume that there are none. It values the connections between in-school learning and out-of-school learning as viewed by each individual based upon his/her own personal trajectories as he/she interacts in all learning situations" (p. 339). The conceptualization opens experience to becoming and interacts with other systems and disciplines in unexpected ways.

At the culmination of *What is Philosophy?*, Deleuze and Guattari (1994) implicate their construction of the planes of immanence (philosophy), reference (science), and composition (art) by arguing that the brain is a junction of the three. At this junction, the planes interfere with each other, providing the means for new knowledge. This interference, much like the interconnectedness and limitless border of the rhizome, has the potential to open new avenues of becoming. New communication technology, and the early theory surrounding it, called forth this interference. As individuals interacted at great distances in Rheingold's virtual community, they interfered with each others' beliefs, opinions, and planes. However, as search engines have become the predominant form of access to the Internet, the companies which manage these systems provide a pre-packaged experience to the user. The terms have been set; tracts already built. As the user becomes more defined through their digital ID card (cookie), she or he become rewarded for continuing on the commercial path already laid forth by their own search history. Even the ability to seek out and purchase literature at the premier vendor at Amazon.com becomes increasingly defined by purchase history and preferences.

While hypertext, as a language, may carry rhizomatic potential, the frequent use of and reliance upon search engines as a gateway into the Internet keeps this potential at bay. As Deleuze and Guattari (1987) warn: "Once a rhizome has been obstructed, arborified, it's all over, no desire stirs; for it is always by rhizome that desire moves and produces" (p. 14). If cyberspace had existed as a rhizome of possibility where random individuals interact and intersect with others, the use of search engines to impose an order upon the massive amounts of information has constrained our desire. From the early promises of a new democratic order, the Internet has become arborified. The newly grown trees are especially apparent in the algorithmic structures of Web search engines, which chart the Web under the façade of a map with many entry points, but only becomes a tracing of those who pay or play into the system. Starting a search at Yahoo! privileges those who pay entry into the Yahoo! database. As the user navigates the map, the unidirectional

signs point toward those with wealth and power. If users find entry through Google, which promises results without human tampering, the flaws in the system are displayed through politically motivated manipulations. On the whole, the potential for both the interference of knowledge through competing disciplinary lines of flight and the embodiment of resistance to dominant capitalist structures, are severely mitigated as the user becomes increasingly ingrained into their own experiences.

Rather than believing that the system is bankrupt, I offer this chapter as a cautionary tale. As new media critical theorists approach the Internet for theory, examinations of the quotidian and vernacular use of the Internet rather than its ultimate potential should be considered. While individuals such as Stefan Wray have been able to utilize the Web for electronic civil disobedience, this potential is not realized by every user. If 60 million users approach search engines daily for their gateway into the Web, considerations of their experiences must be analyzed. In this chapter, through an analysis of the everyday use of the Internet, the rhizomatic structure appears to have grown trees of predetermined experiences in which knowledge itself is limited at the end of its branches. Web search engines, while convenient and technologically sophisticated, also present philosophic barriers to our growth as humans. The changes in use of the Web from Bulletin Board Systems, MUDs, and IRC, have brought forth the cooptation of the digital realm by those with more wealth and power. Recognizing the recreation of the digital divide from the angle of production is a vital step in scholarly work on cyberculture. As daily use of search engines is likely to rise, critical scholarship should engage these gateway systems to question their promise of democratic informatics.

In a similar vein, future research in to the Internet should locate and demystify the romantic notions of its promise as a democratic medium. While the potential for the Internet to have profound effects on the distribution of information to mass audiences, the commercial takeover of production, reception, and distribution has fundamentally altered the digital landscape. Research should also investigate hacktivist groups, such as the Critical Art Ensemble, as they perform acts of electronic civil disobedience. The limits upon expression, access, and production, through tools such as search engines, should be opened to critical inquiry and debate. At a fundamental level, rather than seeing the Internet as a site of radical democracy, scholars should approach new media studies to observe and deconstruct the ongoing capitalist expansion through cyberspace.

3.5 Conclusion

While the Internet continues to move and morph through technological moments, its presence and prevalence will only continue to impact the lives of millions. As fundamental functions of daily life move online, critical theorists and scholars of new media should be wary of its power and use. To believe that one device, however expansive it may be, can serve as a panacea to the ailments of democracy underestimates the power of capitalist expansion. Web searching, which provides

access points to billions of documents to 60 million users daily, cannot be overlooked as a benign entry point into the Web. Rather, Web search engines have become critical gatekeepers to the vast knowledges contained within digital databases across the globe. Through the organization of the sea of Webpages, Web search engines simplify and structure information into tracts. While convenient, these tracts continue to preclude our ability to generate new means of knowing through the interaction and interference between random users of the Internet.

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