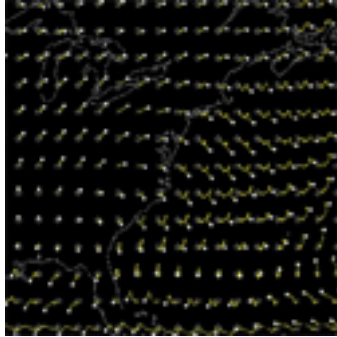


# Lichty > Art in the Age of DataFlow

## Narrative, Authorship, and Indeterminacy



**ABSTRACT:** How to write a chapter that ostensibly has no end? Who is the author when anyone can edit? Does dialogue occur on listserves and blogs? How do we make meaning of trends? I look at the emergence of nonlinear narrative (1940 – 2006), using the mathematical terms *scalar*, *vector* and *flow* as conceptual or visual metaphors that describe structure, transmission, and social patterns. *Scalar* examines the set, non-linear narratives of hypermedia and the indeterminate narratives of Wikis; *vector*, the dialogic narratives of listserves and blogs; and artistic visualizations that seek to reveal patterns as *flows* of information in networked cultures increase. These modes of representation, and the artists who exemplify them in this chapter, illustrate the transition from linear to non-linear narrative, the emergence of indeterminate notions of authorship and readership, and the problematic nature of communication and representation in open networks.

Consideration is given to pioneers of interactive and networked systems, Vannevar Bush and Douglas Engelbart, without whom contemporary hypermedia would not exist.

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**BIOGRAPHY:** [Patrick Lichty](#) (b.1962) is a technologically-based conceptual artist, writer, independent curator, animator for the activist group, The Yes Men, and Executive Editor of Intelligent Agent Magazine. He began showing technological media art in 1989, and deals with works and writing that explore the social relations between us and media. Venues in which Lichty has been involved with solo and collaborative works include the Whitney & Turin Biennials, Maribor Triennial, Performa Performance Biennial, Ars Electronica, and the International Symposium on the Electronic Arts (ISEA).

He also works extensively with virtual worlds, including Second Life, and his work, both solo and with his performance art group, [Second Front](#), has been featured in Flash Art, Eikon Milan, and ArtNews.

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# Art in the Age of DataFlow: Narrative, Authorship, and Indeterminacy

In addition to your *comments* and *translations*, you are invited to **edit** this chapter.

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# Introduction

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One asks, “How to write a chapter that ostensibly has no end?” One of the parameters of this text as commissioned by Turbulence.org in 2009 was that it could be released as a Wiki, one conceivably editable by anyone with permission to do so. This simple fact, contrasted with the mutable nature of this thesis over time creates discursive problems for both the author and commissioners. By proposing a document with the possibility for endless revision, the function of the originating author — myself — merely starts a conversation from which all else becomes discursive potential.

The effects of indeterminacy in online media have precedents in the work of a number of theorists and computer scientists. Barthes’ *death of the author* [Barthes, 1977] stated that once a written “work” is transmitted to the audience, the writer in effect ceases to exist. In the 1960’s, Douglas Engelbart envisioned a networked real-time textual development system called the On-Line System (NLS) that made hypertext, object addressing and dynamic file linking possible. This system allowed a number of users to simultaneously read and write online documents, thus problematizing the role of the cultural producer by multiplexing the roles of creator and consumer.

During the same period, literary theory was predicting the way online media can structure meaning. Joseph Frank’s 1943 concept of literary spatial form posits that texts like Proust’s *In Search of Lost Time*, famous for its length and sense of “involuntary memory”, and Joyce’s *Ulysses*, 265,000 words about a Dubliner’s ordinary day, collapse narrative into a simultaneous non-linear moment in time.

Spatial form, and agency of choice coupled with nonlinear narrative will inspire hypertext literature like Michael Joyce’s WOE [1991] the first major Hypercard literary work, Mark Amerika’s *Grammatron* [1997] one of the largest online hypertext novels, and Scott Rettberg, et al’s *The Unknown* [2002], an “oeuvre” of hypermedia texts. Hypertext works will then expand into more conversational forms through mail-lists, blogs, and social media. Manik’s (Vauda & Pilipovic) aphoristic proclamations on online listservs, which often took the form of troll messaging, leading to flame wars in e-mail lists such as Syndicate and Rhizome, and the emailed/blogged love story of Yael Kanarek’s *World of Awe* illustrate narratives comprised of lists and blogs. These two works illustrate differences between two models of transmission, the mail-list and blog. The mail-list “reflects” an email; a message is first posted by one entering the list and then retransmitted to all registered to that list. The blog is an episodic transmitter, with periodic entries. Both define cultural transmitters and their audiences in that each mode of communication has a specific way of building a community and conveying its information. The mail-list could be seen as more of an agora for the exchange of messages, while the blog might be seen as a public “soap box” that people learn about and aggregate with others largely by cross-linking and word of mouth. With the tremendous amount of information generated by blogs, online data, and social media, artists are now making works that map patterns of trends and indices that intuit the shape of “flows” in online data. Examples include Martin Wattenberg’s diagrammatic maps generated from live Wall Street data, and Golan Levin’s graphic visualization of metrics gleaned from teenage breakups posted on blogs in *The Dumpster*, which I will talk about in more detail in the section on *Flow*.

In placing emphasis here on mail-lists and blogs, I do not intend to exclude the Wiki, which is a hybrid, as it has a mutable structure with revision trails. The Wiki form was aptly probed by Kildall and Stern in *Wikipedia Art*, by creating a self-referential conceptual art entry that revealed the internal social structures and modes of production in Wiki communities, especially Wikipedia.

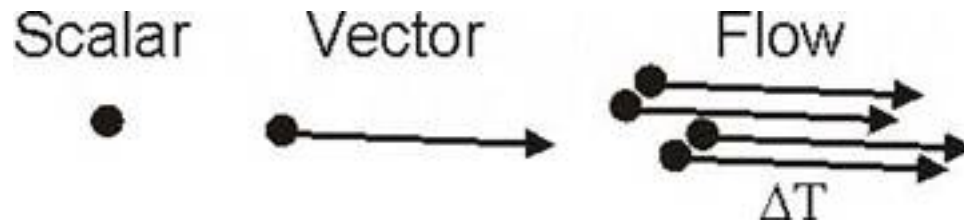
All of these writers, researchers and artists have done invaluable work in advancing the development of narrative structure (scalar), the trajectory of communication (vector), and the overall trends in interaction (flows).

While the following discussion does not intend to suggest a linear development of art's journey from structure to flow, it does propose that the development of the discussed theories, technologies, and artworks reflects a culture striving to understand the way it relates to itself in the face of tremendous change.

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# Defining Terms

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I have mentioned the terms *scalar*, *vector*, and *flow*. When using these, I want to stress that they are conceptual or visual metaphors which are borrowed from mathematical terms to describe narrative structure, transmission of narrative, and social trends within large sets of transmissions/narratives. Structure is represented by the *scalar*, or formal quality; here I use it to represent how narratives from modern literature to hypertexts arise from spatial form. In spatial form, narrative becomes a single point in time, its events to be accessed in no particular order.

The *vector*, or movement of the scalar, represents communication, or the transmission of the narrative through a medium. But there are different modes of transmission of narratives, different directions/intents, and magnitudes that represent the scope of the media, and how they are transmitted over time. This could be as simple as considering the size of the audience of a narrative work and how the narrative reaches it, or the singular or episodic nature of an email to a list versus the communicative function of a blog. Lastly, *flow* — the metaphor of acceleration — represents a larger concept, or the rate of change of information represented as social trends in an online community.

One example of tracking these trends or “flows” is [Twitter’s](#) (microblog) “trending” statistics, which determine dominant conversational topics within the community by tracking key words and phrases. Techniques like trending, tagging, and indexing allow us to try to infer relationships within large sets of data, or in large sets of interactions that might seem overwhelmingly complex. Artistic visualizations and analytics can reveal insights about these trends, or flows, within a set of interactions or community.

The ideas of *scalar*, *vector* and *flow* are then analogous to that of narrative structure, its transmission, and the mass movement of narratives and their respective transmissions within an online milieu.

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# Joseph Frank and the Collapse of Narrative Flow

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In 1945, Joseph Frank published *Spatial Form in Modern Literature* in the *Sewanee Review* [Frank, 1945], proposing a model of narrative that challenges traditional notions of linear progressions in time. His assertion is that writers such as Eliot, Proust and Joyce have broken the linear model of narrative thus creating a sense of time that collapses, creating a literary space from a single point of memory.

For Frank, the creation of space is the linking of narrative to non-linear time, thus reflecting the relatively new conception of Einsteinian space-time. But by breaking with the use of linear time in the creation of narrative, by collapsing time into layers, these writers have created random access ordering now familiar in online media.

Frank's analysis draws from Lessing's *Laocoon*, which in turn draws its discursive foundations from classical and 18th Century European thought, to "define the limits of literature and plastic arts" [Frank, 1991]. Frank begins with the following text, using it as an anchor to previous thought to reconsider the issue of literary formalism:

*Many of Lessing's conclusions grew out of a now antiquated archaeology, whose discoveries, to make matters worse, he knew mainly at second hand. But it was precisely this attempt to rise above history, to define the unalterable laws of aesthetic perception rather than to attack or defend any particular school, that gives his work ... perennial freshness ...* [Introduction, Frank 1991]

Framing his arguments in Lessing's terms, Frank places himself in an historical discourse while, at the same time, maintaining his focus on modern literature. He thus reserves for himself the right to make the audacious statement that literary narrative is no longer linear, and that literary formalism has, in effect, changed.

Of course the concern with formalism in literary and plastic arts was part of the contemporary zeitgeist in the mid-20th Century; *Avant Garde and Kitsch*, which was a seminal article in Clement Greenberg's development of his definitions of high and low culture, and ultimately Modernist Formalism in art, was published six years earlier, in 1939. Frank uses the argument for reconsidering Lessing, and thus for a reconsideration of forms under a modern rubric, to argue that narrative structure in the 20th Century is collapsing, shifting from sequences of events into moments in time. Under the model of spatial form, time and structure implode rather than progress. Although the implosion of linear structure in spatial form is not identical to browser-based hypermedia, it does create the framework for theorizing the temporal and formal simultaneity of online media. This will lead scholars like J. Yellowlees Douglas to arrive at the indeterminacy of closure in hypermedia — then of form in hyperbolic browsing — and then in openness of content in Wiki-based media.

Frank's analysis of Proust's *In Search of Lost Time* and Joyce's *Ulysses* are prescient in anticipating structural aspects of narrative in networked media. In Proust, Frank notices the disappearance and reemergence of characters — such as the narrator's absence in a sanatorium and his attendance at the reception of the Princesse de Guermantes — as asynchronous, as is much of the rest of the story. *In Search of Lost Time* is seen as a raconteur's moment of recollection, rather than a linear flow of time. In establishing Proust's narrative as a moment in memory, Frank establishes the book's spatial form as taking the form of the narrator's collapsed moment of recollection. This also establishes Proust's "random access" style; we can begin to imagine a contemporary viewer at a screen, clicking around the narrator's recollections. Frank's choice of analyzing Proust provides a thoughtful metaphor for considering the juxtaposition of narrative, human memory, and computational memory.

Joyce's *Ulysses*, according to Frank, uses a similar conceit, portraying the whole of Dublin with little framing or order to the presentation. My metaphor for this sort of narrative is as if one learned the collective story of a community by way of entering a pub and talking with the patrons, bartender, etc. One can get different perspectives

on the town; each new person will have unique bits of information and one can go from person to person; and sequencing can define much about the feel for the “reader’s” view. This is the sort of holistic perspective I get when considering spatial form and the books Frank analyzes.

This collapse of the linear flow of narrative into an “all-at-onceness”, its events not meant to be read in any particular order, also emerges in theoretical works, such as Deleuze and Guattari’s *A Thousand Plateaus*, or even earlier in Benjamin’s *Arcades Project*. With regard to *A Thousand Plateaus*, Brian Massumi writes in the Translator’s Foreword:

*What do you do with a book that dedicates an entire chapter to music and animal behavior- and then claims it’s not a chapter? That presents itself as a network of ‘plateaus’ that are precisely dated, but can be read in any order?*  
[Massumi, 1987]

Massumi’s playful consternation with his translation project fits with our spatial model — possibly not only with its form, but perhaps even with genre — by its inclusiveness of topics. At the risk of becoming too broad in scope, I would like to suggest that discursive spatiality often tends toward the encyclopedic. Perhaps the spatial form resembles Wagner’s “*gesamtkunstwerk*” (total work of art) at times or the 18th Century Wunderkammer, which was a personal museum or “cabinet of curiosities”.

Benjamin’s *Arcades Project* certainly embodies this in its representation of 19th and 20th Century Paris from the viewpoint of the flâneur, the wanderer about the city. Benjamin takes in bits here and there from writings, architecture, and interactions to construct a nonlinear cognitive map of one of the greatest cities of the world in a sprawling set of reflections. He also re-presents a feel for the space of the city and how he moves through it, presaging Debord’s concept of psychogeography or the affective relation between individuals and the (usually urban) landscape. While I am mentioning a nearly thousand-page set of documents in what may appear an offhand fashion, what is important in its inclusion is the spatial form of the overall work, as it tries to reflect in a holistic experiential map. In many ways, Benjamin reminds me of a theoretical Ulysses in Paris, but he goes a step further. Benjamin’s holism presupposes the volition of the readers to go as they will, which is consistent with Frank; but it also shows the *Project* as a map revealing the terrain in his mental organization of the city. This terrain can also be said to show the affective patterns of Benjamin’s discourse in relation to Paris, i.e. its psychogeography. It also reveals insights about the patterns as the flows of social activity within the milieu through his anecdotal accounts, revealing how culture manifested itself in his time. These flows of interactions of the city’s inhabitants with the affective landscape serve as a good metaphor for some of the pattern recognition schemes that emerge in a number of the works that I will discuss in the section on Flow.

The nonlinearity of both *A Thousand Plateaus* and *The Arcades Project*, in context with Frank’s analysis of Proust, Joyce, (and Eliot) show spatial form as a modern literary practice in a broader context than simply fiction. We could also cite many other works, such as Harold Pinter’s play, *Betrayal* [1978], which details the unfolding of two couples’ histories from recollections in semi-reverse order. The prominence of literature that has elements of spatial form will lead to literary theories that call into question the resolution of hypertext narrative. The question that arises is, once we have collapsed time into a single randomly-accessible space, once we get to hypertext literature, is there any way to have narrative closure?

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# On Narrative Closure

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In “*How Do I Stop This Thing?*”: *Closure and Indeterminacy in Interactive Narratives* [Douglas, 1987], J. Yellowlees Douglas investigates spatial form in hypertextual literature by drawing upon Frank’s ideas of spatial form and nonlinearity and its translation into hypermedia. Douglas notes spatial form’s navigation through parallel levels of collapsed time by indicating the similarities between Proust’s *In Search of Lost Time* and Michael Joyce’s *WOE – Or a Memory of What Will Be* [Joyce 1991]. In *WOE*, Joyce employs a memory map on the screen, illustrating the schematic relations of the narrative lexia or media chunks of the story. As Douglas notes, there are discontinuities in *WOE* that lead the reader to question the meaning of the text. For example, the indeterminacy of narrator and character is evident through unspecified characters, as, for example, when one portion of the text identifies an indeterminate woman as “not Filly”, as she wears a perfume that smells good on Filly. As with Proust, characters come and go, and sometimes one is not entirely sure what the sequencing of the narrative is. Douglas draws parallels between *WOE* as hypernovel and Proustian nonlinearity by equating the lexia of the hypernovel to Proust’s navigation of layers of time. This nonlinearity, Douglas states, creates a cycled “rereading” in hypermedia that calls into question the nature of closure. The reader/user in a hypertext novel can try to find the end, may wander around for a while, and perhaps never attain any sense of closure at all.

This indeterminacy of closure is also evident in hypermedia literary works like Mark Amerika’s *Grammartron* [Amerika, 1997] and Scott Rettberg’s *The Unknown* [Rettberg, et al. 2002]. *Grammartron*, Mark Amerika states, consists of “over 1100 text spaces, 2000 links, and 40+ minutes of original soundtrack” [Amerika, 1997], hinting at the abyss of lexia, and the statistical impossibility of closure by virtue of *Grammartron*’s scope. Golam’s sprawling cyber-erotic adventures based around the Grammartron Project, a metaphor for the author’s ambitions, whose mission is stated as:

*...to project his, Golam’s, creative work to as many different people as possible over the Net and to have all of these different people pay him as many credits as they could cough up to help support his habit which, it ends up, was nothing more than continually pursuing his projects.* [Amerika, 1997]

To sum up, Golam (an obvious analog for “golem”, or avatar) is in a Gordian knot of chasing his goals of infinite recognition through net.stardom, that will fund the work and enable him to chase his dreams some more. Therefore, Amerika erects a hyperlinked wilderness of mirrors or, as Golam states, “meaning.” “I’m Abe Golam, an old man. I drove a sign to the end of the road and then I got lost. Find me.” The problem is that Golam seems to have lost his way, and cannot tell you how he got where he is; in effect, he is leading the reader into his own recursive web. *Grammartron* exhibits a structural imposition that necessitates a Proustian wandering and “re-reading” that specifies a non-linear spatial form as per Frank. One question that arises is whether spatial form, (in hypermedia or in text as we have seen with Proust and James Joyce) is defined by the challenge of closure, i.e., defined by that form’s potential of infinite wandering? Perhaps, but Rettberg, et al. offer an interesting solution to the spatial hypernovel by introducing a narrative indexing narrative in *The Unknown*.

In *The Unknown*, Scott Rettberg and collaborators extend the spatial form into a playful conceit of claiming it as the “Great American Hypertext Novel” [Rettberg et al, 2002], echoing Amerika’s assertion that *Grammartron* is “the most widely accessed hypertext on the World Wide Web”. But *The Unknown*, unlike *Grammartron*, is one aspect of a larger lexial constellation. Using the graphic conceit of a color index inspired by the Chicago mass transit system, it posits that *The Unknown* is not just a hypermedia novel, but a larger oeuvre, including related correspondence, live readings, and art. This reminds one of Foucault’s *What is an Author?* [Foucault, 1977], in which he asks what constitutes an authorial work. How mundane can a “piece” be to be considered a work? Could Kafka’s laundry list be considered a work? Could all the ephemera, events, as well as the hypertext of *The Unknown*, be considered “the work” by virtue of its inclusion or is it just web documentation? Given our discussion of spatial form and hypernarrative, it would seem logical to say yes, but this further questions the notion of closure in spatial form. This includes not only closure in reading, but also an indeterminacy of closure relating to production. Although this



points towards the Wiki, I would like to take a moment to consider historical precedents to hypertext and collectively editable texts.

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# Forerunners of Hypermedia

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One of the key forerunners of hypermedia — the Memex — was envisioned in 1945, the same year that Frank published his seminal essay. As an aside, the only inference I am making is the odd coincidence of the two appearing at the same time and the evidence that multiple disciplines were concurrently considering the changes that were happening in communication. It was the end of the Second World War, and Bush was considering how new computational technologies could be used to further the lot of the human species. His proposition was a device called the Memex, a portmanteau for (Mem)ory Extender that was proposed in his essay, [As We May Think](#) [Bush, 1945]. It consisted of an interactive microfilm recording and annotation system for the storage and analysis of information pertinent to the user, plus a system to link and store associations between topics. Content, from personal photos to scholarly material, could be purchased ready-made or recorded directly on the translucent data screens on the top of the device.



*The World-Wide Memex (Collage)*

Looking at this device, one can see the amazing similarity to surface computing, with its ability to record and manipulate documents placed on the screen. But the defining feature of the Memex was “associative indexing”. This is where the operator can associate the selection of one item to cause the recall of another, or, in effect, create a hyperlink. As Bush states, “The process of tying two items together is the important thing” and the gesture at the foundation of all hypermedia. The links create trails of association, that don’t fade with time and that act as a form of retrievable metatagging. In addition, more items can also be added to the skeins of associations in the Memex, to

create a database of preferences for the user(s). The process of reviewing the trails and indices of the Memex through interaction with interactive associative trails is the seminal description of hypermedia browsing, albeit electromechanical and non-networked. However, Bush's device was designed for single users, and it would take Douglas Engelbart to lead the development of a multi-user, document environment that would resemble later developments such as the Wiki.

In 1962, Douglas Engelbart (also known as the inventor of the mouse) was working at Stanford Research Institute on the creation of the NLS, or oN-Line System [Bardini 2000, 135]. The NLS used a tightly ordered, collapsible outline format so that a uniform structure of information could be used across the NLS, defining the format of document creation and organization. In addition, the NLS utilized the mouse and a new five key chording interface. The new interface and uniformity of document structure represented Englebart's belief in the co-evolution (or augmentation) of human-computer symbiosis in that humans and computers would need to challenge one another to create new ways of working [Bardini, 2000, 53-56]. Documents could be dynamically edited by all users on the mainframe, and also had the capability to link to other documents. Although at this time mainframes time-shared access to the system, the NLS allowed for live, asynchronous editing of documents by multiple users. Although the main artifact that remains from the NLS is the mouse, creating the point/click interface for later web browsing, Englebart's document structure also laid the groundwork for the ordering of browser languages. But what is most significant is that the NLS created a paradigm of collective authoring in online spaces, which would be expanded upon later by the Wiki.

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# The Wiki

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Now that we have investigated the roots of hypermedia and open historical document systems, I would like to turn to a contemporary technology, the Wiki. It is a communally editable webpage driven by a server-side database that further complicates the idea of closure in narrative production. The Wiki is a dynamic archive, open to revision by the community authorized to edit it. The reason why I am considering the Wiki almost in another category is that it fits into multiple categories; it is hyperlinked, social, time-based, and it reconfigures the archive dynamically over time. Although the Wiki is mutable, it tracks revisions by author, date, etc., thereby visualizing flow. It also has a hyperlinking schema reminiscent of the Macintosh HyperCard. And it develops content in ways that are largely bottom-up and dialogic (community) rather than top-down (institutional). It is therefore important in terms of the direction of transmission between media and audience, which is part of my idea of the vector. But what is most germane here is the indeterminate nature of the closure of the document.

Although Douglas argues that reading hypertexts uncovers a lack of narrative closure, the lack of authorial closure complicates the matter even further. In the cases of *Grammaton* and *The Unknown*, each has a central author and is constructed as static web pages that are updated by that author. In a Wiki another phenomenon occurs that looks similar to that of the waveform of a bell. When a Wiki-media article with a sizeable community is posted, the process is that the text is reviewed by a number of editors and admins. and then, if it is not removed, it goes through an intense period of correction. The discussion about the topic then attenuates over time, although new authors or current events may “strike the bell” again, setting off the process of normalization once more. The document is never closed, and the potential for change continues to exist, although over time it becomes less likely. Furthermore, the possibility exists for references in Wikis to link to dynamic documents, creating the potential for an Indra’s Web of cross-dependencies. This is one reason why [Wikipedia](#) often stresses links to print media. This reveals the dialectic between the static and the dynamic, and where the current tolerance for solipsism and communal limits for openness lies.

What forms of art are possible in dynamic community-based social document environments? One form is that of the conceptual project, Kildall, Stern, et al.’s [Wikipedia Art](#) project [Kildall, Stern, 2009]. *Wikipedia Art* was conceived as a simple social intervention into the online social resource Wikipedia in the spirit of the Surrealist exquisite corpse. It was created as a self-referential article proposed by Kildall and Stern, and placed by critic and Wikipedia co-admin Jon Coffelt, who kept other community admins at bay until the project attained a tenuous existence on the site. *Wikipedia Art* set out to question the permeability or potential for subversion of the boundaries of the Wikipedia community and its social protocols. Because of the social dynamic of the piece, the narrative shifted from what was originally a conceptual strategic position to a performative tactical one, as the most important aspect of the work became records of interactions on Wikipedia, like the deletion debate.

The events of the deletion debate unfolded roughly as follows. Certain administrators ran interference for the project while the Wikipedia community argued about *Wikipedia Art*’s deletion on the discussion page. Arguments about the conceptual merits of the piece were weighed alongside the violations of Wikipedia standards, like solipsistic references. 15 hours later, an 18-year-old admin named “Werdna” removed the entry [Owens, 2009]. While the debate raged, artists and collaborators found arcane rules for community conduct, like the “Snowball’s Chance in Hell” and “Don’t Feed the Trolls” rules. The first refers to whether the entry has a “Snowball’s Chance in Hell” of remaining on Wikipedia, and the other to not letting “trolls”, “griefers” or other intentional irritants get any attention for their activities. In an institutional setting, such protocols would be differently worded, if they existed at all. The difference in institutional or corporate social protocols (policies) with those of grass-roots communities (e.g. forum rules), define the shape of their respective cultures, which is expressed in the form of their cultural production, narrative, literary, or aesthetic.

In the months after its removal, online communities like Rhizome.org and the “blogosphere” took up the issue of the project’s inclusion. After its demise, the new article was called the “Wikipedia Art Controversy”, creating a new set

of discussions. This provoked Wikipedia Foundation founder, Jimmy Wales, to call Kildall and Stern, “a group of trolls” i.e., disruptive individuals in the social media milieu [Owens, 2009].

What is evident from this is that in networked environments and their communities, there are sensitivities in the ongoing negotiations between literature, art, context, and intentionality in projects that use open forms. In many ways, our exposition of spatial form and indeterminacy is a progression from *Grammatron's* singular hypertext to *The Unknown's* oeuvre, to *Wikipedia Art's* complex set of texts (the <http://wikipediaart.org> site), the two articles, and then the social narratives that performatively emerged around the work. The challenge with this progression is that the correlation between complexity, indeterminacy, and diffuseness of thought creates incoherence unless one uses indices and maps or other methods of making the shape of structures/correlations in large sets of data more “tangible”. This will be covered in the Flow section, but next we will consider the travel from author to audience in online environments, or the vector.

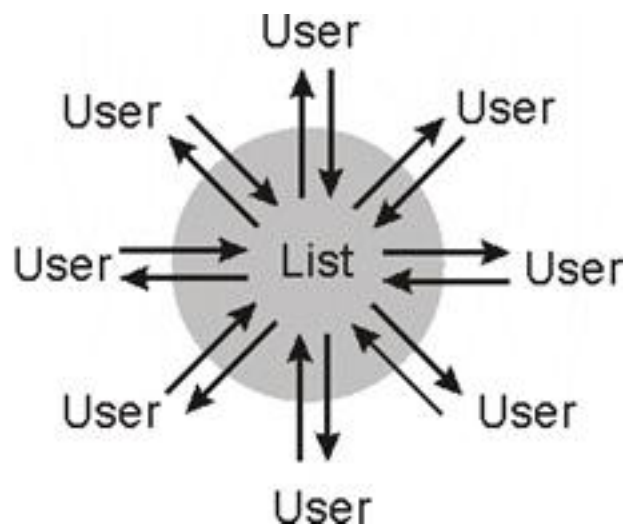
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# Vector

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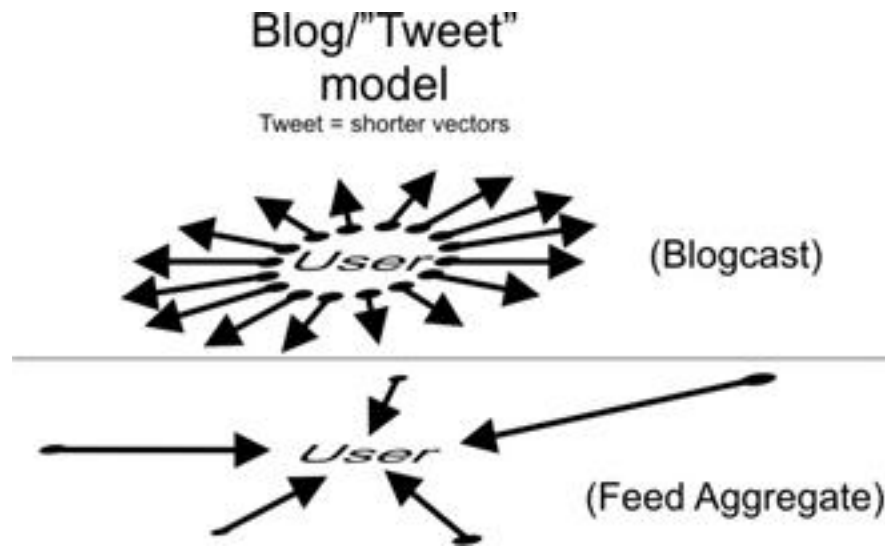
The next step in my discussion of digital narratives and communication in a vast online environment is to consider my metaphor of the vector. This particular idea is far more about mode of communication than structure, and therefore much more relational than our discussion of narrative structure. In the Translator's Foreword to Deleuze and Guattari's *A Thousand Plateaus*, Massumi explains Deleuze's use of the vector as a "point of application of a force moving through a space at a given velocity in a given direction" [Deleuze & Guattari, 1987]. The point of application is the content, and the movement is translation into the online social milieu. The question is, where does the information go? Who does it go to, if anyone? Does it go to a community for discussion, or is it posted on a site for possible discovery and possible aggregation into someone's daily "news"? How does it propagate? These are much more social concerns than narrative ones, although the two are not separate, as here McLuhan's pronouncement of "The Medium is the Message" is very true. This is because each communications method has different effects; as follows. A listserv is more communal, a forum has categories and "topics", and a blog is a more singular transmission, like a micro-broadcast. For our comparison, I would like to discuss artists who have used the listserv as a medium, Manik [aka Marija Vauda & Nikola Pilipovic], blogs (Liza Sabater), and a blog that tracks flows of ideas, trends, or memes (Olson, et al.) as we then transition into the section on *Flow*. I also want to stress that even though this writer is fully aware that there are far more models of online intercommunication than just blogs and listservs, these two offer a contrast of flows of information that are useful for our general discussion.

In analyzing the vectors of content (narrative, art, etc.) in networked environments through the work of Manik, Liza Sabater and NastyNets (Olson, et al.), I want to compare my ideas about the trajectory of information in the listserv and the blog. The listserv, implemented in 1986 by Eric Thomas [livinginternet.com, 1996-2009] is a collective email reflector that has a list of subscribers to whom a message is forwarded every time one of them posts to the server. The listserv is used by many new media art groups, including [Furtherfield.org](#), [Institute for Distributed Creativity](#), [empyre](#), and [nettime](#). The function of the listserv then is analogous to a huge discussion circle where everyone is able to hear everyone else's statements. The message-vector travels into the server, where it propagates out to all the recipients on the list. Therefore, the diagram for the listserv could be seen as a central node with double ended arrows, all signifying the bidirectional communication of this sort of electronic agora. However, when it is used by any one user, the only bidirectional vector is that of the originator, as his content is reflected to the originator. All other vectors go out to the other participants.



Blogs have a very different schematic relationship in the way they communicate. Consider a large circle representing the blogosphere, or collective community of bloggers. Next, place points of application (blogs) with

vectors of force (feeds) going out in all directions inside that circle. The diagram might resemble a high school illustration of gas inside a balloon, with the atoms transmitting packets of information throughout that circle.



The possibility that someone will read the blog may emerge through a search engine or word of mouth, but the definition of audience as in the listserv is indeterminate or open. This openness is another form of indeterminacy, theorized in hypertext and the Wiki, but now relating to the audience. Blog content is usually static, but episodically added to, so to talk about indeterminacy in blogs is not to talk about the narrative or author, but about “target”. Also, as blogs establish themselves, readerships and affinities with affine bloggers occur, with the emergence of “rings” and link-chains (aka cross-linking). Therefore, although in the beginning, the blogosphere is an ideally indeterminate milieu in terms of audience, “molecules” of association form by these associations. One could almost think of these clumps and chains as hydrocarbon rings and chains that link and form larger molecules. Using this metaphor playfully, perhaps it is not surprising that the blogosphere is sometimes explosive.

Manik (Marija Vauda & Nikola Pilipovic) are a collective in Belgrade, Serbia whose works range from conceptual paintings to ASCII art — i.e., art created with nothing more than computer text. Their work mixes intellect — they are frequent textual contributors to new media lists — with a fierce intransigence that questions the nature of the art world and its politics of status. While Vauda and Pilipovic are multi-media conceptual artists, their [Art for Beginners](#) series on the Rhizome listserv [Manik, 2002], is a direct polemic for new media’s emergence on the international art scene in the early 2000’s. It consists of small (about 320 x 240 pixels) images that comment upon or satirize artists’ or art’s effectiveness as a genre. These images are lobbed like grenades into the list, like *Art II for Beginners* with its simple black “Art Macht Frei” (the phrase placed above German labor camps during the Holocaust), and *Tender Touch for beginners* with an understated “Hiroshima” on an olive background. I would like to speculate that *Art for Beginners* contains a Serbian perspective that reminds the West (as Serbia has had a liminal status as a semi-sanctioned country since Milosevic) of the “banality of evil”, a phrase coined by Hannah Arendt to describe Eichmann’s denial of responsibility for his actions in the Holocaust during his Nuremberg testimony [Arendt, 1963]. In this way, I feel that in part, Manik, with a small gif image, subtly reminds the (largely) Western net.art audience of its own banality in the face of the ongoing effort of the peoples of the former Yugoslavia to cope with the fallout of the Balkan and Kosovo conflicts.

When one considers my definition for the propagation of information through a listserv, these are exactly what Manik’s posts are, mind-bombs, with the blast radiating through the perimeter of the recipient list. This is also a DADA-like jamming of the list with aesthetic antagonism rather than overt hostility which would present the work as trolling, or a senseless tactical provocation. The use of the word jamming comes from the fact that there were a minimum of thirty such works during the month of December, thus forcing awareness of the work through sheer volume. Still, *Art for Beginners* artfully used the medium of the listserv as a method through which to channel a polemic and nearly guarantee discussion by targeting the Rhizome community.

Another artist who has gained community through her use of blog as art is NYC-based Liza Sabater. Her [Culture Kitchen](#) blog [Sabater, 2009] has earned recognition in such national media as (US) National Public Radio, where she has been a commentator. Her blog is also a polemical space, with a mission to “explore socially libertarian and politically progressive solutions to the issues of everyday life in the United States by focusing on arts, culture, entertainment, life, media, politics, sex, and technology”. Originally conceived as a new media project, it originated from the Rhizome community. However, rather than a formal project, Sabater’s blog is a social experiment, exploring the social space of the blogosphere to connect its vector to like ones, to place itself in “progressive molecules”. The political thrust of *Culture Kitchen* and the use of the blog to inject comment into the national discourse are reminiscent of the Revolutionary War-era pamphleteer, or Tactical Media. Both act(ed) as methods in which individuals or small groups could leverage technology to surgically place their political message in the public conversation and incite discussion. Because of the success of Culture Kitchen, Sabater has effectively used the modes of communication specific to the blog as a tool for public discourse.

Artists are also utilizing the blog medium as a form of curation, its users becoming what Anne-Marie Schleiner would call “filter-feeders” or people who filter content in service of feeding culture [Schleiner, 2002]. This has given rise to the web surfer as artist, which has itself become a collective cultural practice. Marisa Olson, in [Lost Not Found: The Circulation of Images in Digital Visual Culture](#), describes the “Internet surfing club” in which:

*...internet artists, offline artists, and web enthusiasts who were invited by the group’s co-founders (of which I was one) to join them in posting to their website materials they had found online, many of which were then remixed or arranged into larger compositions or “lists” of images bearing commonality.* [Olson, 2009]

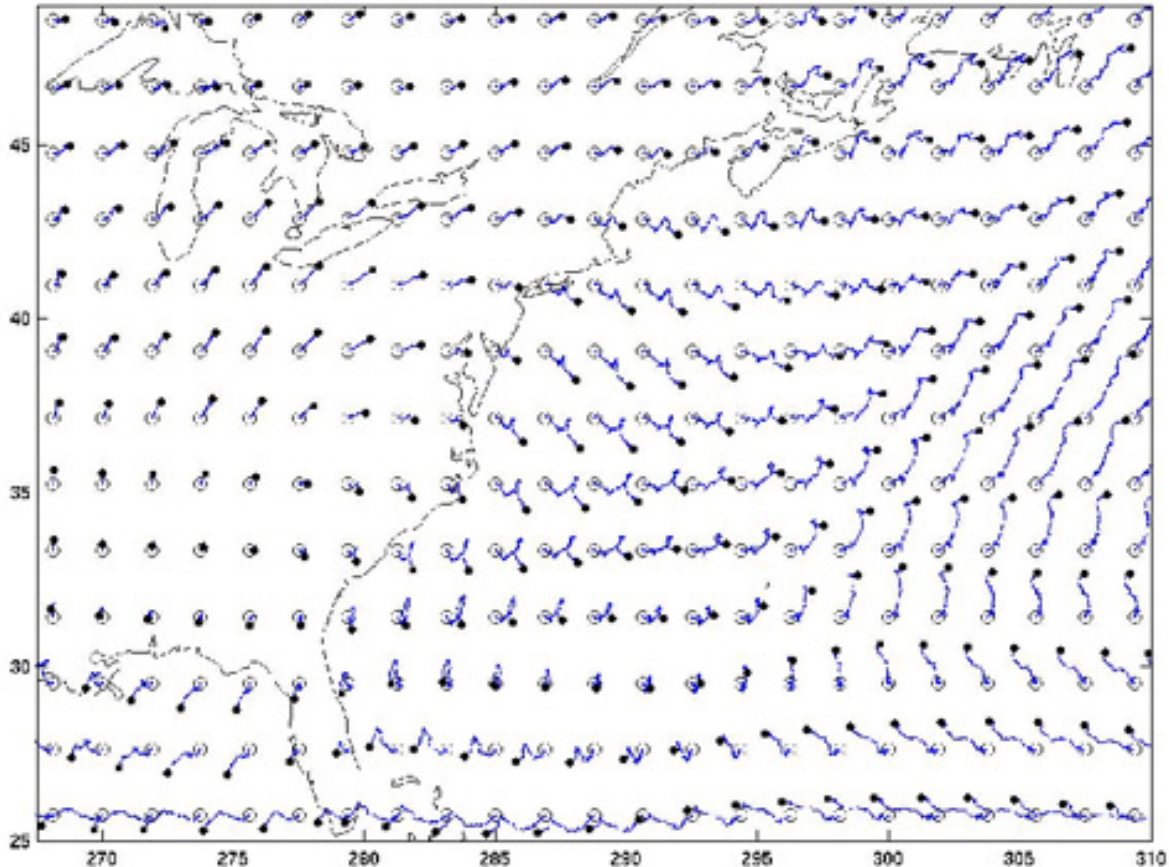
Olson and [NastyNets](#), her collective of “prosurfers”, a play on prosumer, a term for an advanced (usually amateur) computer enthusiast, surf between the boundaries of vector and flow, blogging (microcasting) about their “lists of commonality” (discernment of cultural flows). Their results are posted to the blog, and exhibited in the gallery on disks full of their collective explorations, as “art in variable forms, and ... an art in sharing ... other found “footage.” [Olson, et al. 2008] *NastyNets* is a pattern recognizer of net memes — the term meme was coined by Richard Dawkins as a mind-virus, that spreads through “infection” and “mutation” — and a trend definer through their position as recognized cultural curators. Therefore, the creation of the “surfing club”, of which *NastyNets* is only one, shows an awareness of the torrential nature of net.culture by recognizing that the curators of the present are so inundated with information that they now have to surf content, or navigate flows.

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# Flow

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*Progressive Vector Diagram of wind patterns over the US maritime coast [Law, 2000]*

Cultural production that tracks trends, indices and metadata in order to draw larger inferences about large sets of data or interactions (another form of narrative) is a set of practices which track social and information “flows”. Expanding from the mathematical/logical method used by Deleuze regarding the vector, the flow is an acceleration or *change* in speed or direction of vectors (usually large numbers of them) that reveals a trend or “shape”. As discussed at the end of the section on structure, as hypertexts become indeterminate in terms of authorship *and* reading, *as well as* being released to collective processes, the idea of trying to find closure appears almost silly. To derive or determine the narrative of large sets of lexia or interactions at macro-scales, one has to create indices or maps to get a feel for meta-structures of the overall terrain. Then one can (if desired) zoom down into more specific areas of information or narrative. The index and map are two prominent methods of mapping flows of interaction, and create an intuitive or affective relationship between the viewer and the data. In many ways, Debord’s [psychogeography](#) applies here, except now we are dealing with large terrains of information rather than a city or landscape, and the index or map orders it so one can wander around it. In my examples, the artists track market trends, program flows in classic video games, and the terrains of teenage heartbreak. Each one takes a very complex set of data and at least tries to create a visually tangible schematic of that data, one that is both intuitive and aesthetically compelling.

Martin Wattenberg has been creating cognitive maps that depict structural relationships in complex systems of data in order to reveal trends and correlations. His [Idealine](#), the first new media artwork commissioned by the Whitney Museum of American Art in New York City, is a database driven timeline of net art of the 1990's. He describes it as a "... timeline of net artworks, arranged in a fan of luminous threads. Each thread corresponds to a particular kind of artwork or type of technology. The brightness of each thread varies with the number of artworks that it contains in each year, so you can watch the ebb and flow of different lines of thought over time" [Wattenberg 2001]. The categories range from the conceptual, such as minimal, to genre, such as humor or activism, to technical, as in a given programming language, like c++. As the visitor to the site scrolls across the lines of affinity, mapped by luminosity for the frequency of their occurrence, the "fan" set or "concurrent timelines", depending on the visualization method, pop open to reveal works in the database. Net artists were invited to submit to the work online, and their submissions were then placed into the piece. *Idealine* is one of the few existing attempts at mapping 90's net art that currently exists online.

Wattenberg's most noted work in mass consciousness is [Map of the Market](#) [Wattenberg et al., 1998-] created for SmartMoney.com. It uses the rectangular tree map scheme popularized by Ben Shneiderman, and used in part in programs like GrandPerspective for the Mac, where disk usage is shown by size and type of file. However, where *Map of the Market* intuitively gives a feel for the activity of the market by correlating capitalization versus change (from green to red), in looking at various sectors of the market, such as commodities, utilities, banking, and then varying my time snapshot, I was able to get a very quick idea which of the stocks selected for the Smartmoney.com map were performing short and long term, as well as a good overview of the "portfolio" in the map. This sort of work is a good index for the overall market and the performance of sectors and particular stocks; to deal with them discretely at first glance would be far more of a challenge.

Ben Fry's best known work is [Valence](#) [Fry, 2002], an algorithm that tracks occurrences and associations in large sets of data that was featured in the display of the movie *Minority Report*, and in the 2002 Whitney Biennial. Fry has used *Valence* to analyze Mark Twain, the genomes and to make a comparative analysis of books. As the program reads through the data, it tracks several factors and creates intuitive associations between them. In the case of Twain, higher degrees of word occurrence will move the word further from the center for better visibility, and the more often two words are in sequence, the closer they will appear. *Valence* gives form to a gestalt; a "feel" for the qualitative properties of a body of data, like Twain. As Fry states on his website:

*The premise is that the best way to understand a large body of information, whether it's a 200,000 word book, usage data from a web site, or financial transaction information between two multinational corporations, is to provide a feel for general trends and anomalies in the data, by providing a qualitative slice into how the information is structured. The most important information comes from providing context and setting up the interrelationships between elements of the data.* [Fry 2002]

While the cultural acceptance of *Valence* gives evidence of its compelling nature, Fry appears to wonder whether ultimately it has utilitarian purposes. To this end, he has applied the general algorithm to visualize web traffic by page hit and user information, but within a straight-line form, rather than with the arcing method of the popularly known version. With the web version of *Valence*, frequent hits and the frequency of hits between immediate pages is evident. Fry successfully takes a body of data and its interactions and makes another clear set of legible associations.

Two sets of mapping that have similar functions but different ends are Fry's [Distellamap: Pac-Man](#) [2005] shown in the MoMA's Design and the Elastic Mind exhibition, and Wattenberg's [Shape of Song](#) [2001] that was shown at Bitforms Gallery, NYC, and can be seen on the Turbulence.org site. Both are examples that map temporal structures, one being the execution pattern of the assembly code of classic Atari 2600 games, and the other an analysis of structures in musical composition. In *Shape of Song*, Wattenberg takes his algorithm and loads it with MIDI digital music data. It then looks for deep structures in the music, like repeating themes and motifs, and draws sets of arcs between them to signify their similarity. For example, the folk tune "Oh Clementine" is clearly a repetitive structure, while Madonna's "Like a Virgin" shows a much more chaotic pattern. *Shape of Song* is visually seductive, though; but while it shows a compelling visual metaphor for the structural qualities of a song, one may wonder about the desire to believe a map because of its aesthetics or because it was computationally generated.

Fry's *Distellamap: Pac-Man* is a similar sort of analysis of a temporal data structure, but here it is the execution of the 6507 assembly code of popular Atari 2600 videogames. For the Design and the Elastic Mind exhibition, Fry displayed a disassembly of the cartridge *Pac Man*. In the schematic, the "opcodes" (instructions) are seen to the left, and the raw character/ship data is visualized as a simple bitmap at the end, which is the structure of the cartridge code. The trajectory of execution is then shown as a series of arcs, jumping from block to block. The ghosts are clearly visible as is Pac Man himself. The significance of this particular body of work is that it provides a quick, intuitive glance at the programming styles. Compared to multiple disassemblies, the Pac Man code shows a convoluted map of the artificial intelligence within the game, showing its unusual complexity. I would imagine that for vintage Atari cartridge hackers, Fry's mapping schema might give insights about the structure of a cartridge's game engine (kernel) and how to modify it by using *Distellamap*. However, just as a display of the code and its execution, it evokes a sense of wonder about the magic of the limitations that vintage programmers had to contend with, as well as nostalgia for the first waves of video gaming. In a way, it shows a map of 70's technoculture.

My last example of works that work with flows in information sets is *Dumpster* [Golan Levin, Kamal Nigam, Jonathan Freiberg, 2006]. This work analyzes millions of blogs (by definition online) and then parses entries to cull ones that have to do with teenage breakups. As Levin states, "visitors to the project can surf through tens of thousands of specific romantic relationships in which one person has "dumped" another." The 20,000 or so breakup entries obtained over 2005 have maps for date, gender, and daily volume. But when I interacted with the piece, I was led to general conclusions that also had an emotional impact. The posts I read were predominantly female, (a quick scan through the left-hand side point cloud suggests this correlation), and reveal teenage women kicking out their young men, comforting one another, triumphing, and lamenting. On one hand, *The Dumpster* provides an affective, sympathetic map for young romance and its patters of demise. But as with many of our maps of flows, one asks what data are being analyzed under what criteria. Could *The Dumpster* be a tool for sociological research, or is it a social media index of a certain cross section during a certain time that suggests certain results. Or are all of these flow-tracking flows more important for their qualitative/affective aspects than their quantitative use? I believe that if nothing else, works that track trends and flows of interactions and processes give their viewers some inference about metastructures with huge amounts of data, and from that they can make intuitive leaps. More importantly, these works by Wattenberg, Fry, and Levin reflect a culture that is awash in data, and is developing new strategies to make sense of it.

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# Conclusion

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The creation of non-linear and networked cultural production is a tradition that has roots that span back nearly a century, if one considers the literary sources from which spatial form is theorized. Humanity questioned the limits of mind, technology, and society during the 20th Century, and especially in the post-World War II era. After this time, visions of new media like those of Bush and Engelbart emerged concurrently with literary theory and would integrate at the end of the century as hypertext literature in works such as those of Joyce and Amerika. However, this expands the challenge to author and audience as both wrestle with indeterminacy of closure, first in reading hypertext, and then with authorship in dynamic, collective authoring environments like the Wiki. This indeterminacy of closure, and multiplicity of forms of social media, (one can consider a listserv a form of pre-Web 2.0 social media) causes us to ask not only what the narrative function of networked cultural production is, but also what its vector of transmission and receipt is. The one to one correlation, which was actually killed by Gutenberg with the invention of the printing press, is changed into a panoply of modes of communication, origins and termini. My example, contrasting the listserv with the blog, leaves out the narrative potential of forums, “friend-based” social media, and the Wiki as collective literary authoring sites. What appears evident is that dynamic, collectively and systematically created content sharply decreases the possibility of static narrative (even hypertext) and closure of any kind becomes non sequitur. What is left is the “surfer” or the cartographer who tries to discern the ever changing landscape that he navigates, or re-form that dynamic stuff into his own shape-shifting form. This is not to say that the progression of new forms of cultural production eliminate their predecessors — video did not kill cinema — but we can say that media do reconfigure discourse. This being said, contemporary society, of which networked culture is just a part, exhibits cultural production that reflects its technological challenges, as it is deluged with information which it tries to make sense of. Therefore, while we read, write, and share, at historically unprecedented levels — the word “unprecedented” is currently being used at unprecedented levels as well — the networked individual faces such an enormous information overload that he surfs, he indexes, he maps, he goes with the flow.

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