What Hypertext Is

Noah Wardrip-Fruin
Traveling Scholar, Brown University
Box 1852, Providence, RI, 02912
01-401-863-3260

nwf@brown.edu

Visiting Fellow
School of Applied Communication
Royal Melbourne Institute of
Technology

Visiting Researcher
Digital Arts and New Media
University of California, Santa Cruz

ABSTRACT

Over the past couple decades, as the term "hypertext" has gained a certain popular currency, a question has been raised repeatedly: "What is hypertext?" Our most respected scholars offer a range of different, at times incompatible, answers. This paper argues that our best response to this situation is to adopt the approach taken with other terms that are central to intellectual communities (such as "natural selection," "communism," and "psychoanalysis"), a historical approach. In the case of "hypertext" the term began with Theodor Holm ("Ted") Nelson, and in this paper two of his early publications of "hypertext" are used to determine its initial meaning: the 1965 "A File Structure for the Complex, the Changing, and the Indeterminate" and the 1970 "No More Teachers' Dirty Looks." It is concluded that hypertext began as a term for forms of *hypermedia* (human-authored media that "branch or perform on request") that operate textually. This runs counter to definitions of hypertext in the literary community that focus solely on the link. It also runs counter to definitions in the research community that privilege tools for knowledge work over media. An inclusive future is envisioned.

Categories and Subject Descriptors

H.5.4 [**Information Interfaces and Presentation**]: Hypertext/Hypermedia — *Theory*.

General Terms: Design, Theory

Keywords

Hypertext, hypermedia, hyperfilm, stretchtext, hypergram

1. INTRODUCTION

How can we answer the question, "What is hypertext?" Our most respected scholars offer answers that span a wide range. In the literary community, the definitions offered often focus on the link. Marie-Laure Ryan [5], for example, states that, "In hypertext… the reader determines the unfolding of the text by clicking on certain areas, the so-called hyperlinks, that bring to the screen other segments of text." Espen Aarseth [1] offers a similar view of the term, writing that, "Hypertext, for all its packaging and theories, is an amazingly simple concept. It is

merely a direct connection from one position in a text to another." In the computer science community definitions can sound somewhat different. In a forthcoming article a number of well known hypertext researchers from the University of Southampton [6] argue that link-based understandings miss "some of the more profound aspects of hypertext" especially "hypertext-as-interaction with information to build associations, and through associations to build knowledge." In a similar vein, Peter J. Nürnberg's [4] closing keynote for the Hypertext 03 conference ("What is Hypertext?") offered "structured knowledge work" as a summary of the focus of the hypertext research community.

Given these incompatible definitions, we could argue that one group or another has more right to define the term. But intellectual communities must be home to arguments over the definitions of key terms — as these are arguments about the meaning of the field, necessary if we are to avoid stagnation. Better, instead, to understand the history of our terms, so that we may see how competing definitions of the moment are movements in different directions from a common starting point. That is to say, when we ask the question, "What is hypertext?" we are asking a question fundamentally similar to questions such as "What is psychoanalysis?" "What is natural selection?" and "What is communism?" We are asking about the meaning of an intellectual term coined by a particular thinker, around which further thinking has grown. While such terms are often taken in a variety of different directions after they are coined (much as Stalin took usage of the term "communism" in a direction that Marx is unlikely to have imagined) it is generally agreed that serious discussion of the meanings of such terms must begin with the work of thinker who coined them.

In the case of "hypertext" the term was coined by Theodor Holm ("Ted") Nelson. This paper examines two of Nelson's early publications of the term in order to provide a starting point for historically-informed definitions of the term.

2. HYPERTEXT, FILM, AND MEDIA

While Nelson may have presented the terms earlier, his first significant publications of the terms "hypertext," "hyperfilm," and "hypermedia" occur simultaneously — in the 1965 paper "A File Structure for the Complex, the Changing, and the Indeterminate" [2]. As the title suggests, this paper was primarily concerned with outlining a file structure (the Evolutionary List File, or "ELF") inspired by Vannevar Bush and intended for personal use by knowledge workers. However, a final section makes a departure, noting that file structures like the ELF "make possible the creation of complex and significant new media, the hypertext and hyperfilm." Two paragraphs later, Nelson expands the term "hypertext" in this famous sentence: "Let me introduce the word

'hypertext' to mean a body of written or pictorial material interconnected in such a complex way that it could not conveniently be presented or represented on paper." In the following paragraph "hyperfilm" is briefly mentioned again: "The hyperfilm — a browsable or vari-sequenced movie — is only one of the possible hypermedia that require our attention."

It is worthwhile to note the following: (1) "hypertext" and "hyperfilm" are coined within the same sentence; (2) both hypertext and hyperfilm are characterized as "new media"; (3) the larger category in which at least the hyperfilm is included is "hypermedia"; (4) while hypertext includes written and pictorial material, material that functions cinematically has its own term (hyperfilm); and (5) while what Nelson offers in this brief section does not explicitly contradict definitions of hypertext that focus on the link, links are not mentioned.

3. FORMS OF 'HYPER-MEDIA'

Just as Nelson's 1965 paper was initially concerned with the presentation of a file structure (rather than an explication of "hypertext"), his 1970 "No More Teachers' Dirty Looks" [3] begins with a critique of concepts of "computer-assisted instruction" connected to his critiques of the dreams of artificial intelligence. Nelson's proposed alternative to such systems is "responding resources." He writes, "Responding resources are of two types: facilities and hyper-media." On-screen calculators and graph plotters are given as examples of facilities. Nelson then writes of hyper-media:

> Hyper-media are branching or performing presentations which respond to user actions, systems of prearranged words and pictures (for example) which may be explored freely or queried in stylized ways. They will not be "programmed," but rather *designed, written, drawn* and *edited,* by authors, artists, designers and editors… Like ordinary prose and pictures, they will be *media;* and because they are in some sense "multi-dimensional," we may call them *hyper-media,* following mathematical use of the term "hyper-."

Nelson then presents examples of types of hyper-media that could be made available to students. The first of these is under the heading "Discrete Hypertexts." Nelson writes: "'Hypertext' means forms of writing which branch or perform on request; they are best presented on computer display screens... Discrete, or chunk style, hypertexts consist of separate pieces of text connected by links." This is the first appearance of the term "link" in the essay.

Nelson next presents a type of hypermedia called the "hypergram" ("a performing or branching picture") followed by another form of hypertext — "stretchtext." Nelson writes: "This form of hypertext is easy to use without getting lost… There are a screen and two throttles. The first throttle moves the text forward and backward, up and down on the screen. The second throttle causes changes in the writing itself: throttling toward you causes the text to become *longer* by minute degrees." Note that Nelson referred to hypertext as "forms of writing which branch or perform on request." Discrete hypertext uses links to *branch* on request. Stretchtext uses no links — instead making a non-branching *performance.*

Nelson's essay continues, outlining further types of hypermedia such as the "hypermap" (a smooth zooming interface) and "queriable illustrations" (a type of hypergram). The fact that both "discrete hypertext" and "stretchtext" are situated within this list of examples of types of hypermedia leaves little doubt that hypertext is a subcategory of hypermedia. While the behaviors of discrete hypertext and stretchtext are quite different, what unites them is that they are "forms of writing." While the examples shown of hypergrams, hypermaps, and queriable illustrations all include text, discrete hypertext and stretchtext are textual, are writing, in their mode of operation (even if they include pictorial material). Hypermedia, also, are differentiated from "facilities." They are not tools, but media — "*designed, written, drawn* and *edited.*" From this we can conclude that tools such as spreadsheets and word processors are, along with calculators and graph plotters, not hypertext.

We can now, based on our examination of Nelson's texts, provide the first two sentences of a historically-based definition of hypertext appropriate for a world familiar with the Web: "*Hypertext* is a term coined by Ted Nelson for forms of *hypermedia* (human-authored media that branch or perform on request) that operate textually. Examples include the link-based 'discrete hypertext' (of which the Web is one example) and the level-of-detail-based 'stretchtext.'"

4. IMPLICATIONS

How should a historically-based definition of hypertext continue, after these initial sentences? It would make sense to note that, in the literary community, the definition of hypertext shifted so that it applied almost exclusively to chunk-style media. It could be speculated that this took place because most authors who called their work hypertext fiction or poetry worked in link-oriented forms (though exceptions such as the work of Jim Rosenberg were well known). Within the hypertext research community a different shift took place, with a focus on knowledge work (largely on tools Nelson might have instead called "facilities") rather than media. At the same time, this community maintained a definition of hypertext's possible structures that was broader than the chunk-style. With the rise of the Web (a chunk-style hypertext media system) the term's popular understanding shifted.

Going forward, those of us who discuss hypertext, in any community, must decide whether we want to acknowledge this history. If we do, those working in the literary community must reconsider hypertext definitions focused on the link, and those working in hypertext research must reconsider definitions that privilege knowledge work over media. We may find, in such historically-motivated broadening, our future.

5. REFERENCES

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