



Halasz's "Seven Issues" in Context

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Abstract

Frank Halasz's "Seven issues" paper first received widespread distribution in the July 1988 *Communications of the ACM*. It appeared at a time when hypertext and hypermedia systems were receiving widespread attention. In this retrospective, I discuss the role of this paper in supporting and encouraging the broadening of the interests of the research community and its relevance in today's World-Wide-Web-centered milieu.

Keywords

hypertext/hypermedia, user interface design, World-Wide Web

Introduction

Frank Halasz's "Seven issues" paper (1988) was originally prepared for the Hypertext '87 conference proceedings and, along with other selections from that conference, was subsequently reprinted in a slightly more general form in the July 1988 *Communications of the ACM*. This was a period of time marked by an expansion in interest in hypertext/hypermedia systems and their applications. Halasz's paper, although it is set quite firmly in the context of the NoteCards system's design, raised issues of general applicability. Within the research community, its effect was to legitimize the reexamination of the precepts of hypertext systems and thereby encourage the exploration of new concepts. I will discuss these effects in more detail later.

Four years later, at Hypertext '91, Halasz presented an update to the "Seven issues" paper as the closing keynote address (Halasz, 1991). Titled "'Seven Issues': Revisited," the talk reexamined the original seven issues and presented a revised list of seven technological and three market issues. The presentation was an intellectual *tour de force*, surveying and contextualizing literally dozens of hypertext systems and research efforts. Unfortunately it was never written up as a paper, and so remained unavailable to non-conference-attendees until a few years ago when a transcript was made available on the World-Wide Web. Even so, the presentation attracted its own devotees and has been cited in subsequent Hypertext conference proceedings.

Historical Significance: Citations of Halasz's Papers

What is the historical significance of Halasz's "Seven issues" paper? To gain a better understanding of this question, we can begin by examining the effect that it has had on papers in subsequent ACM Hypertext conferences.

Figure 1 shows the percentage of published papers in the ACM Hypertext series citing these two papers. The three lines represent those papers referencing the "Seven issues" paper, those referencing the Hypertext '91 keynote, and a combined number reflecting those citing either (or both). As the figure shows, the works were commonly referenced through the 1994 conference, and even today, a few authors continue to reference the "Seven issues" paper. Most of the references to the "Seven issues" paper are to the *CACM* version, although a few are to the Hypertext '87 original.

About a third of the references to "Seven issues" made in Hypertext '89 papers focus on its description of NoteCards. While use of the paper as a convenient NoteCards citation continues in subsequent conferences, the instances are markedly decreased—generally at most only one paper per conference does so. In the earlier conferences, the references to the seven

issues seem primarily to be used as support for claiming that the problem addressed by the paper is of significance. Indeed, in a few of the papers from conferences in the early 1990s, one finds laundry lists of the issues that are claimed to be addressed by the research presented. In later conferences, the references acknowledge the "Seven issues" paper for its introduction of a concept or term, most frequently that of composite nodes; this is the primary use that survives in the latest conferences.

Notably, few of the hypertext research projects citing the "Seven issues" seem to have been *driven* by the issues identified. Instead, they call on the paper, and the following keynote address, for *validation* of the topic of investigation. One senses that the work might have been done anyway in the absence of the "Seven issues" but that the authors find a sense of security in the fact of their enumeration.

My Own Experiences in Hypertext

My interpretation may be better understood if I describe my own experiences in the hypertext field. I first began working in the hypertext area during the renaissance reflected in Halasz's paper, with my first paper in the area appearing in the Hypertext '89 confer-

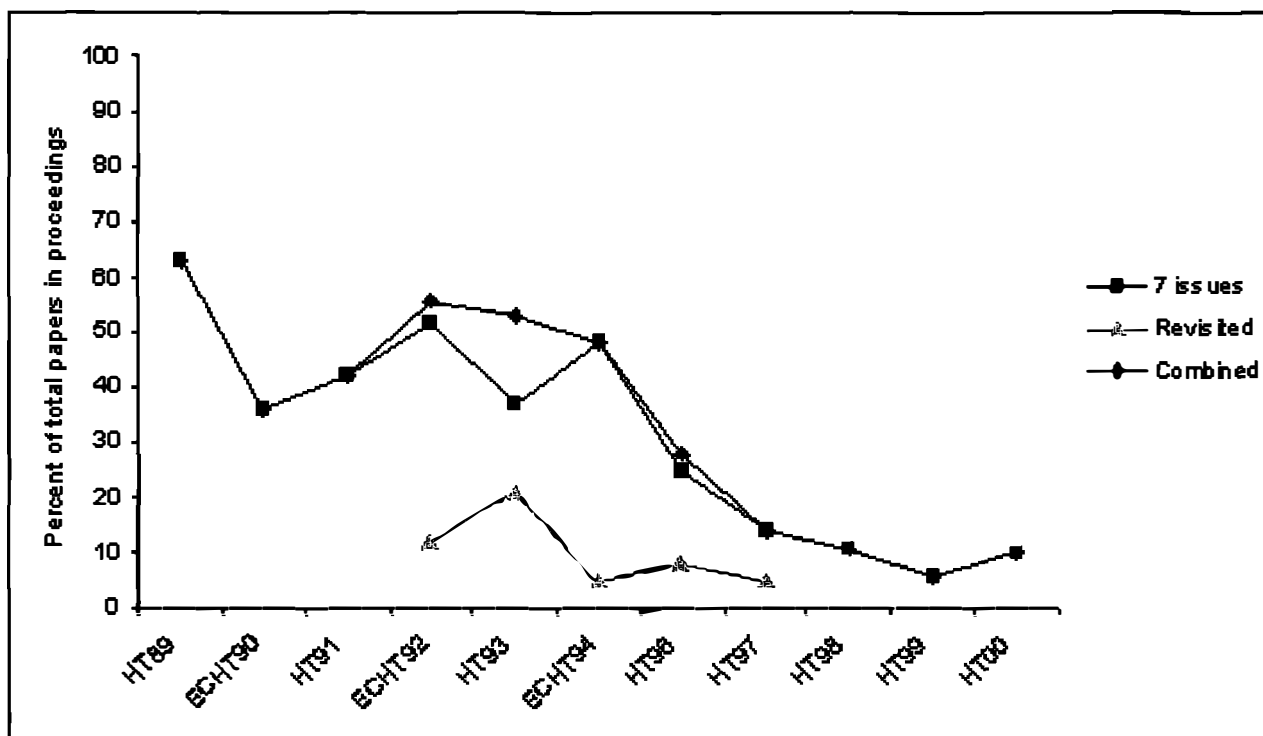


Figure 1: Citations in Hypertext conference papers to Halasz's papers.

ence. In a sense, the Hypertext '89 conference was the first large-scale research conference in the area. Attendance at Hypertext '89 was open. Attendance at the earlier Hypertext '87 (which I did not attend) had been controlled through evaluation of required position statements (statements which appear in the Hypertext '87 proceedings). Additionally, Hypertext '87 was publicized idiosyncratically, so some learned of it only after it had been held.

The mood at Hypertext '89, to me, was expansive—entrepreneurs focused on their commercial interests were present and eagerly looking for the next hot idea, clouds of devotees surrounded the pioneers of the field, and there was talk and hopes of subsequent conferences attracting thousands of attendees. And, as with many new and active areas of technology, it seemed to me that there also was an effort by the "old timers" to codify the already established contributions in the field through definition and categorization. At times, however, this effort could be exclusionary. Open debate raged over what was and what was not a hypertext system, focusing especially on Apple's Hypercard: hypertext, hypermedia, programming environment, macro language, ...?

In this environment, Halasz's "Seven issues" provided a bridge between the established and the expansive. It promoted the thesis that the concepts behind hypertext systems still required fundamental exploration, and that their future was not limited only to application and exploitation. The 1991 "Revisited" keynote continued the theme. I recall this as being a compelling keynote, to which many paid keen attention—in large part to see if their own research efforts had been noticed and understood.

I think it accurate to say, then, that "Seven issues" and "Revisited" were important in supporting the building of a cohesive community of hypertext researchers in the early 1990s. From the community viewpoint, the significance of the "Seven issues" paper is perhaps similar to Jeff Conklin's survey of hypertext, which appeared in the September 1987 issue of *IEEE Computer* (Conklin, 1987). Conklin's survey, which enumerated the features of the then-current hypertext systems, provided an entry point for many hypertext researchers. However, unlike Halasz's "Seven issues," Conklin's survey has caused debate about its conclusions; his identification of the "disorientation problem"

(also known as "getting 'lost in space'") has both been much cited and much disputed.

From a long-term view, "Seven issues" seems to me to be a paper of the moment—not as timeless as Vannevar Bush's 1945 classic "As We May Think" (Bush, 1945) (appearing in both *The Atlantic Monthly* and *Life* magazines), but still one of greater import than most research reports.

Relevance of "Seven Issues" Today

What is the relevance of the "Seven issues" today? Certainly *the* major change to the environment between then and now has been the ascendancy of the World-Wide Web.

The popularity of the World-Wide Web caught the hypertext community by surprise. In the minds of many, the hypertext model embedded in the Web was one that the community had long evolved past. This is foreshadowed by Halasz's definition of hypertext in the first paragraph of the *CACM* version of "Seven issues":

Hypermedia is a style of building systems for information *representation* and *management* around a network of multi-media nodes connected together by typed links.... The simple node and link model is just not rich and complete enough to support the information representation, management, and presentation tasks required by many applications (Halasz, 1988, p. 836).

One might argue that even the simple model presented in the "Seven issues" as a foil already was a superset of that of today's Web.

The Web, and its intensely pragmatic architecture, has required a rethinking of the assumptions of hypertext, hypertext systems, and the ways in which they are used. Issues of embedding, rather than interoperating, dominate. Broad categories of operations (e.g., search and versioning) can be viewed as ancillary to, rather than integrated into, the central concerns of the system. Ownership of content is diffuse rather than centralized, and so structural relationships must be discovered, rather than managed. The dominating metaphor in the Web is that of publishing, or promulgating, information, and so collaboration issues are among those that generally do not seem to be central to the design of Web sites.

The change in the hypertext milieu, while inviting

adjustment to research focus, has not invalidated the earlier work of the hypertext community. Indeed, the Web has presented the opportunity for the research community to further validate and expand ideas initiated in the era of the "Seven issues" paper. Inspecting recent Hypertext conference proceedings shows many such reapplications in the Web context—for example, paths, automatic hypertext generation, and literary applications.

Today, there seems, once again, to be a move from the homogeneity driven by the common characteristics of the commonly used Web browsers towards a more heterogeneous hypertext environment, driven especially by the increasing availability of mobile devices. Tiny-sized displays, limited graphics, slower hence less power-hungry processors, and decreased network bandwidth all join to make the simple, direct application of desktop-computer-based interfaces difficult. Portability of devices, and the developing ability to determine a device's location and its proximity to other devices, suggests an increasing need for applications that are aware of characteristics of their physical environment.

I expect that there will be continuing value for the hypertext research community in continuing to reexamine and evaluate its assumptions. Perhaps the retrospectives collected in this issue will entice Frank to revisit again the issues reformulated in his "Revisited" talk. I, for one, believe that there are concepts here that can be of value to today's generation of hypertext researchers.

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****People:****

- Halasz (Frank Halasz)

- Richard Furuta

- Jeff Conklin

- Vannevar Bush

****Institutions:****

- Department of Computer Science Texas A&M University

- ACM (Association for Computing Machinery)

****Places:****

- College Station, TX

****Conferences:****

- Hypertext '87 conference

- Hypertext '89 conference

- Hypertext '91 conference

****Products and Systems:****

- NoteCards system

- Hypercard (Apple's Hypercard)

- World-Wide Web

****Publications:****

- Communications of the ACM

- ACM Journal of Computer Documentation

- The Atlantic Monthly

- IEEE Computer

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