

Is “lost in hyperspace” lost in controversy?

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1.0 Introduction

Hypertext technology still continues to excite many, ever since it became popular in the late 1980s. Many people then were sceptical that the technology might just be a passing fad. However, there are some who think that the promise behind hypertext is too fundamental to disappear quickly, and there are reasons to believe that hypertext technology promises something special. In hypertext, users not only benefit from the information they read but also from the richness of associations supported by the network of nodes and links. Hypertext has affected us directly, or indirectly in almost every facet of our lives, ranging from scientific work to business and education needs, to our general way of life. Take for example the World Wide Web (WWW) on the Internet. By the end of 1994, it has an estimate of 30 million users (Nielsen, 1995). However, hypertext is not a panacea to life's problems (Nielsen, 1995). Associated with hypertext are two classes of problems (Conklin, 1987): problems with current implementations, which include delays in the display of referenced materials, deficiencies in browsers, etc.; and secondly, problems that seem endemic to hypertext such as cognitive overload and disorientation. Cognitive overload is the additional effort and concentration necessary to maintain several tasks or trails at one time. Disorientation is the tendency of users to lose their way in non-linear information. This is commonly referred to as the “lost in hyperspace” (LIH) problem.

Ironically, the LIH problem has given rise to much controversy itself. Some think that the LIH problem is one of the most difficult issues in hypertext research and there is yet more to be done to ameliorate this problem. However, there are others who believe it is not a significant problem and feel that efforts should be channelled to address other more pressing issues. In this paper, we want to re-examine the LIH problem and question whether LIH is a significant problem that still warrants the attention of the research community. For conciseness, we will call multimedia, hypermedia and the WWW “hypertext systems” since the issues surrounding the LIH problem with which this paper is concerned with apply to all of them. In this paper, the term “hypertext” is used to denote a hypertext document that is made up of interlinked pages or nodes. Whereas the term “hypertext system” refers to a set of software tools used to create a hypertext.

2.0 Controversy surrounding the significance of the “lost-in-hyperspace” problem

In a workshop on “The Missing Link: Hypermedia Usability Research and The Web” (1996) held at the Open University, some HCI researchers and practitioners felt that there are more important and pressing issues besides the LIH problem on the Web, and hypertexts in general, that need to be addressed. This came about because of the results reported in the 4th WWW User Survey by the Graphic, Visualisation and Usability Center at Georgia Tech Research Corporation conducted from 10 October through November 1995 (Pitkow and Kehoe, 1995): it was reported from a sample size of more than 23 000 responses that users were not “lost” and the classical LIH problem was not a problem (6.5%), as opposed to the most widely cited problem that it takes too long to view/download pages (69.1%).

If the LIH problem refers to “users not able to determine where they are” as reported in the survey, then perhaps it may not be a pressing issue. But 6.5% of the user population of approximately 30 million in 1994 on the WWW who reported being “lost,” is certainly not a small number. The smallest of usability problems, when multiplied across thousands or millions of users, becomes a source of massive inefficiency and untold frustration (Nielsen, 1993). The LIH phenomenon in our view, however, can refer to any of the following conditions: users cannot identify where they are; users cannot return to previously visited information; users cannot go to information believed to exist; users cannot remember what they have covered; and users cannot remember the key points covered (Conklin, 1987; Mcknight, Dillon and Richardson, 1991; Nielsen, 1995; *etc.*). In the same survey, problems such as these: not able to find a page that they know is out there (34.5%);

not being able to find a page once visited (23.7%); and not being able to visualise where they have been and where they can go (14.3%) were identified as “real” problems. This constitutes an enormous number of users on the WWW, who might not report that they were “lost” but experienced different forms and degrees of “lostness”. These findings give a snapshot of the current WWW user population, and the problems experienced by users on the WWW. Users really are lost. It is not just a superficial disorientation. If users are frequently lost, they will become frustrated and this may influence the way they interact with the hypertext. Worse still, they may cease to use the system because they may feel that they are wasting their time and overlooking crucial information. This is certainly not desirable as the primary objective of hypertext is to provide users with information!

3.0 Addressing the “lost in hyperspace” problem

Most people think the LIH is a *user’s problem*, resulting in improvements being sought in the presentation of information. Not surprisingly, therefore, that much research solutions involve the use of graphical browsers and query/search mechanisms. They seem to make the following assumptions referenced to the *users’* supposed failings (Theng, Thimbleby and Jones, 1996): *users* have a wrong or incomplete conceptual model; *users* lack experience in using hypertext for performing tasks such as browsing; *users* are distracted because of the “embedded digression problem”; and *users* don’t understand the chosen display conventions. And because hypertexts are difficult to build, many commentators are happy to seek solutions in better understanding *users* and helping *them* cope. There has, of course, been some success in this approach — maps, virtual reality visualisation — that no doubt seems to confirm it!

We argue that perhaps wrong or inappropriate solutions are being sought because incorrect or incomplete assumptions are made. Hypertext design is hard, and hypertexts are used less effectively than we would wish. The question we want to ask is: Is LIH primarily psychological or engineering? The answer to this question will have serious implications on the solutions being sought to address the LIH problem. If LIH is a *psychological* problem, then the problem may be entirely due to users’ inability to exploit computer screens, complex information structures, and that nothing in the design is going to ameliorate this.

Though disorientation can arise in conceptual space (within the user’s mind), which most research findings support — we argue that research should not rest on users alone! The LIH problem may not just be a *psychological* problem — it may also be an *engineering* problem. This implies that LIH is perhaps attributable to bad system design, and poor design causes psychological problems too. We agree with Mayes *et al* (1990) that addressing the LIH problem within hypertext goes beyond providing more and more navigational aids.

Could it be possible that because hypertext authors themselves are “lost” in the process of designing and authoring hypertexts, they inadvertently contribute to poorly designed hypertexts, which in turn leads users often being LIH? How can we more quickly find better organisational principles for hypertext? We argue for a move away from treatment to prevention, from treating the user’s symptoms — themselves a reaction to bad design — to avoiding the bad design (Theng, Thimbleby and Jones, 1996). We need to re-examine the way hypertexts are designed and built. We need to examine fundamentally how information should be structured and displayed. We should not assume that if certain design features work well for some information contents and purposes, it will be appropriate for others.

4.0 Conclusion and current work

Although much research effort has been invested to address the LIH problem, it still remains unsolved and certainly merits further investigation. We argued that the LIH problem is not just a psychological problem, it is also an engineering problem. We are currently implementing a practical authoring tool to help designers manage the complexity of the design and validation processes without themselves getting “lost”, which in turn produces better, usable hypertexts so that users will not experience “lostness” when navigating through them.

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