

SOS Calls, Breaking Stories, Network Disinformation, and the Process of Scholarly Communication: Implications for Information Intermediaries.

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Introduction: Caught in the Words of the Web

Harold Innis and Marshall McLuhan were among the first communications analysts to suggest a relationship between the medium through which a message was delivered and the recipient's perception of the urgency of that message. Innis analyzed the use of the telegraph in diplomatics, suggesting that international memoranda delivered through other media were perceived to be less important. McLuhan went further, suggesting that the medium was itself the message. Today, as organizations enhance their global presence cheaply and impressively using the Internet and the World Wide Web, their use of these media would appear to lend credence to claims to legitimacy and accuracy.

However, the new medium poses certain problems for information intermediaries such as researchers, publishers, and librarians, as well as for its end-users. Since virtually anyone with a computer can become an instant Web publisher, one cannot assume that these millions of users necessarily have professional training in the disciplines in which they publish, that they have subscribed en masse to the ALA Ethics Statement, or become members of Computer Professionals for Social Responsibility. Consequently, we cannot ascribe authority and reliability immediately to any network resource. Moreover, trained in the assessment of printed and audiovisual materials, but not necessarily of electronic ones, librarians, archivists, and other researchers, may have difficulty judging the salient features of network resources. The task is difficult enough when the

information providers are people of good will. It becomes trickier still when they are malicious, deceptive, self-serving, or cavalier with facts.

The current paper examines three aspects of electronic communication. First, it presents a brief account of a study into the use of a Bitnet discussion by a geographically disparate group of library software users, predominantly in the developing nations, and its implications for technology transfer. Second, it discusses the use of the Net by astronomers and other scholars conferring about discoveries, and the implications for the scholarly publishing process. Third, it describes an attempt to subvert the process of research by 'loading' a World Wide Website with misleading keywords, and explores some of the most controversial purportedly scientific documents on the Net. Finally, it presents some practical and philosophical implications for librarians and information specialists.

During the summer of 1996 we conducted a content analysis of traffic on Unesco's polyglot CDS-ISIS mailing list, categorizing postings and responses, and demonstrated how the list provided timely assistance to novice and expert users, making up for delays in, or complete lack of, vendor-initiated customer support. However, questions of the accuracy and readability of the postings suggested themselves, together with questions about the sophistication and technical competence of the respondents (Brown-Syed and Witzke 1997).

In the second example, we discuss the use of science-oriented Newsgroups by astronomers, recalling the worldwide confirmation of the discovery of the supernova, SN1987a in the pre-Net days, and mentioning some more nearly contemporary discoveries. In this case, we note issues such as the credit of discovery, intellectual property rights, and the sequence of scholarly publishing. As well, we present evidence of an attempt to misdirect Web search engines by the Heaven's Gate cult, and delve into some of the documents which contain questionable science, and discuss their impact upon the reference and research processes.

The current paper suggests that both ethical norms and essential investigative techniques will be required of information intermedi-

aries such as library reference staff, and demonstrates the use of electronic "hallmarks" which equate to the approved sources of information used in cataloguing, and to similar selection criteria for print and conventional audiovisual materials.

Please Help Me: The Net and User Support

Both the United Nations Educational, Scientific, and Cultural Organization (UNESCO) and the International Federation of Library Associations (IFLA) have long held that information is a prerequisite for economic and social development. Over the past two decades, electronic mail, Internet mailing lists (LISTSERVs) and Usenet Newsgroups, have become commonplace tools for organizations in developed nations. Can we demonstrate their potential for enhancing information provision in the less developed countries (LDCs)? Can we use communications technologies to rectify information disparities which they helped to create? In short, can the Net be numbered among Ithiel de Sola Pool's "technologies of freedom"?

The Computerized Documentation System / Integrated Set of Information Systems (CDS/ISIS) is a software suite designed by UNESCO to facilitate work by librarians and documentation specialists in developing nations. ISIS uses the ISO 2709 (MARC) standard for bibliographic data exchange, and is distributed free of charge in developing countries. This UNESCO project can be seen as complementary to ongoing IFLA initiatives to promote the Universal Bibliographic Control (UBC) and the Universal Availability of Publications (UAP).

In the summer of 1997, we presented a paper at the World Order Conference, held at Toronto's Ryerson Polytechnical University (Brown-Syed and Witzke 1997). In it, we discussed the role of an electronic mailing list (LISTSERV) in creating a world wide polyglot community of ISIS users. With about 500 subscribers world wide, the list is moderated by Hugo Besemer in the Netherlands, and accepts postings in English, Spanish, and French. We report the results of a content analysis of list traffic, backed by an informal survey, conducted during the summer of 1996. The study found that the list was being used to seek timely technical support, and as an arena for discussing common professional concerns.

While some of its functions appear to be characteristic of other `LISTSERVs` and Newsgroups, we believe that the ISIS list presents many distinctive features. The most visible is its use of three official languages. ISIS users rim the gamut from computer neophytes to software developers, and the questions posted to the list range from specific requests for emergency assistance to detailed queries about software availability, installation, and enhancement. Requisite information is sometimes completely nonexistent or unavailable through official channels, and users support one another by generating or sharing it.

Because of the geographic dispersion of users, the variety of institutions they represent, the paucity of manuals in their working languages, and UNESCO's dependence upon third-party distributors, support for ISIS users could be problematic without some such means of linkage. The list appears to provide an appropriate technological solution to an otherwise intimidating logistical problem.

Messages in the ISIS list range from simple and straightforward queries about the use of the list itself, to questions about the availability of, configuration of, or enhancements to the software, to extremely technical questions about developing special programming code. Some users experience frustration subscribing to or unsubscribing from the list. Misdirected "unsubscribe" commands are generally the subject of civil corrective messages. For instance, on 23 February, 1998, Amir Parsi Esfahani, of IranDoc, follows up a novice user's misdirected posting with useful information:

> How do I sign off PLEASE!!!

Dear my friend, you should send the
SIGN OFF CDS-ISIS command to:
`LISTSERV@NIC.SURFNET.NL`
not to `cds-isis@nic.surfnet.nl`
Sincerely yours

In a posting of 3 April, 1998, Michel Caby of the Musée du Désert in France reassures a user who doubts the propriety of his using the

ISIS list rather than personal email:

N'hésitez pas à utiliser la liste de discussion ISIS.
D'autres utilisateurs pourront aussi vous aider et ils
seront souvent plus "informaticiens" que je ne le suis.

On 23 February, 1998, Richard Komzik, of the Astronomical Institute, Slovak Academy of Sciences posted a query about the availability of certain software:

Yesterday I managed to install microCDS/ISIS v3.0
on my linux system together with the Websis gate-
way for WWW access. Everything seems to work
OK. [...] Where is it possible to get the documenta-
tion for CDS/ISIS Pascal?

As anyone who has followed conversations in esoteric Newsgroups or LISTSERVs will know, answers to questions like these come rapidly, from a variety of sources, and with a great deal of variation in sophistication. The recipient, and perhaps the information intermediary, are left with the challenge of sorting out numerous, sometimes conflicting, suggestions, and taking appropriate action. A second problem comes later - when collections of email threads are made available at ftp sites on the Net, for example. The task of evaluating the relative merit of these postings may prove daunting to future historians and archivists.

For Immediate Release: The Net Moves Breaking Stories

On 24 February of 1987, Ian Shelton was working for the University of Toronto Department of Astronomy, at Las Campanas in Chile. Shelton had borrowed an ancient 10-inch telescope, and was using it to continue his doctoral work in his spare time. This was his third night of doing an inventory of a particular class of objects (Marschall 1988). When Shelton developed his photographic plate, something unusual seemed to be happening the Tarantula Nebula region in the Large Magellanic Cloud (LMC). A bright object was clearly visible on the plate, in a spot which had been quiet the previous night. The object was, in fact, the Supernova SN1987A - the brightest object of its type since the year 1006. Johannes Kepler observed a fainter supernova in 1604.

As Marschall (1988) notes, the accidental observation occurred at a perfect time in the history of astronomy, because 20th Century instruments could study the event on a variety of wavelengths - including infrared, ultraviolet, optical, and radio. Davison Soper (1998) provides additional information about the chronology of the discovery and the instruments used to confirm it.. Twenty years later, although the source itself has cooled, controversy and excitement over its nature still flares up in the astronomical literature. The exact mechanism behind the phenomenon (Royal Astronomical Society 1997), the presence of mysterious rings about the remnant (NASA 1998), and even its candidacy for a "black hole," continue to fuel debate, and to do so over the Web.

From an Information Studies perspective, what is noteworthy about this story is the manner in which Shelton's discovery was initially confirmed, given the time-sensitive nature of the exercise, and how the Net might be used today to verify similar ones today. A Canadian astronomer, using a telescope in Chile, had made a discovery, but he had no way of alerting other astronomers effectively. "I had trouble even getting a phone call off the mountaintop back in 1987", he says (Shelton, personal communication, 1998). In the event, someone had to drive to the nearest telex machine to alert the Central Bureau for Astronomical Telegrams, in Cambridge, Massachusetts, thereby alerting other observers and ensuring that its discovery would be properly credited. The telegram, reproduced in Marschall (1988), provided the coordinates of the object. Noting the lack of sophistication of networking at the time, Ralph Martin, of the Royal Greenwich Observatory, and the author of a network guide for astronomers, recalls:

"We got our information about 1987A via a Telex and it was only some months later that we started getting the circulars via DECNET. Virtually everybody got it first via a telephone call and I can remember the excitement at being told of the neutrino results by a contact in Bristol." (Martin, personal communication, 1998).

The story was different in the case of SN1993J. That event was accompanied by a second burst of signals, this time terrestrial. It

came in the form of Usenet Newsgroup traffic, as observers around the world confirmed the discovery, and debated the significance of their results over the Net. The more recent "discovery" of cold fusion by Utah scientists – hotly contested and still uncorroborated – provides a steady stream of Usenet traffic to the present day, as an inspection of the Newsgroup, "sci.physics.fusion", will demonstrate aptly.

Discussing potential discoveries over LISTSERVs or Usenet Newsgroups is not exactly publishing reports of them, since only those interested in, and presumably conversant with various disciplines are likely to read them. For instance, the American Philosophical Association has posted "preprints" of its members' articles to its Web pages for comment, but it is unlikely that the ideas contained therein would be stolen or used prematurely.

What happens when scientists issue press releases before the process of science has run its course, or when they release breaking stories or "research in progress" memoranda to the public or to the news media at large? A good example is NASA's "LIFE ON MARS!" Web page, issued in its first iteration before the 'discovery' had been properly debated, and long-since revised. The original screen layout featured a red background and a banner headline. If the peer review process is short-cut, even other scholars may be led to unfortunate conclusions. However, the quick release of reports about potentially important discoveries can enhance the public perception of science and scholarship, so long as the tentative nature of the findings is stated clearly. Building up hopes which might later be dashed is perhaps unprofitable.

Below the Bottom Line: Disinformation on the Net

In the summer of 1977, we were shocked by the mass suicide of a group of people who apparently believed that an alien space ship was hiding behind the Hale-Bopp comet. The cult, run by a couple known as Ti and Do, believed that the alien visitors were representatives of a higher form of life, which they might attain by shedding the vessels of their bodies. The visitors came with an offer of eternal life in this new form, and in the cult members' view, al-

though suicide was inherently evil, rejecting such an offer constituted a greater one. Accordingly, they ritually drank poison, and succumbed. Evidently, cult members were so convinced of the correctness of their position, they sought to lead anyone interested in aliens, religion, philosophy, or any form of metaphysical or spiritual development, to the "truth" which their ersatz religion offered. They did this by loading their Web pages with covert keywords, designed to subvert the search process, and thus to lead people to their site.

Web search engines, use the title tags and the meta-tag "keyword" found in document headers, to create indexes to Web documents. Some engines, like AltaVista, go further, indexing the actual texts of documents. This practice has made it possible to judge the "relevance" of items to a particular user query, and to rank items on retrieval lists by the frequency with which selected terms occur within them. However, because keywords may be tallied easily but context is harder to determine, the mechanism is open to manipulation. Just as companies hoping to attract customer attention give themselves alphabetically prominent names in phonebooks, like AAAA Towing, Inc., manipulative Webmasters can "load" document headers with particular keywords.

While the practice of keyword loading has been going on for some time, it is perhaps best exemplified in the case of the religious cult, Heaven's Gate, whose members earned money by designing Web pages commercially. The following keywords appeared in the meta tag, "keywords", within the document header. This field is intended for use in constructing search engine indexes. Since search engines increasingly tend to list apparently relevant sites at the top of search set retrieval screens, this tactic would normally cause the site to be ranked highly on such lists. The Heaven's Gate designers deliberately repeated several keywords, to increase the apparent relevance of the site.

Heaven's Gate, Heaven's Gate, Heaven's Gate, Heaven's Gate, Heaven's Gate, Heaven's Gate, ufo, ufo, ufo, ufo, ufo, space alien, space alien, [...] extraterrestrial, extraterrestrial, extraterrestrial, extrater-

restrial, extraterrestrial, extraterrestrial, millennium,
millennium [...] misinformation, misinformation, [...] freedom, freedom, [...] second coming, second coming, [...] angels, angels, angels, end times, end times, [...] Jesus, Jesus, [...] God, God, God

A total of 101 keywords appeared in this field. In theory, the relevance of a document to a user's query depends upon the number of times the keywords used in a search request occur within the text of that document. For instance, a file containing several references to the Buddha is, in theory, more likely to be useful to someone seeking information on Buddhism, than one with only a few mentions of the term. Also in theory, the concept of relevance applies to the body of a text, not to its descriptive header. Because the document header is only intended for control information, and because it is possible to perform a "unique" operation against it, reducing multiple instances of terms to single occurrences useful in indexing. The Heaven's Gate designers were apparently aware of the fact that search engine designers might "unique" their header. In order to ensure a high ranking for their site, they fastened upon a subtle and almost undefeatable method of inserting multiple occurrences of terms within the actual body of the text.

Using the "body bgcolor" tag, the designers first turned the user's screen black. Against this black background, they inserted an image file containing a star field. The text intended for public view was then printed in white or other light colours, creating a dynamic and visually striking effect. Finally, below the body of the text, the designers inserted a "font color" tag which turned any subsequent writing black. They then included more multiple occurrences of keywords. To use a print analogy, any subsequent words would be printed in black ink on a black piece of paper.

Consequently, the terms would not be visible to a user, unless that user noticed that the apparent end of the Webpage was not the physical end of the file: below the last line of text, almost a full screen of empty black starfield was visible. If a user became curious at this apparently inelegant waste of space and bandwidth, and used the browser's "view document source" option to examine the

and

8. Heaven's Gate - How and When It May Be Entered (Spookie Stuff) How and When Heaven's Gate, the Door to the Physical Kingdom Level Above Human, May Be Entered. Organized Religions Are Killers of Souls. UFOs and <http://192.41.31.40/lametco/heavens/gate.htm> - size 10K - 5-Jan-98 - English - Translate

The first site was no longer extant at the time of the search. The second citation pointed to a compilation of the cult's material, edited by a third party, whose editorial comment, "Spookie Stuff", had been inserted into the original title tag of the original Heaven's Gate homepage. Aside from this brief editorial comment, the pages are presented intact.

If the Truth be Told

If network traffic is not as easily verifiable as the contents of peer-reviewed scholarly journals, can it still be used to good effect by information intermediaries? The answer is a qualified "yes". Before you pass on information gained through the Net, whether in the form of LISTSERV and Newsgroup traffic, or from Web pages, it is incumbent upon you to subject that information to at least the same level of scrutiny you would apply to a book or journal.

First, it is imperative that librarians, archivists, and other information intermediaries become familiar with the naming conventions used on the Net. The principal source of knowledge about the origin and trustworthiness of a page of Web information or an electronic mail message is the URL.

The Universal Resource Locator (URL) provides a standard means of directing people to network resources. It is the Hypertext Markup Language (HTML) code used to establish links among sites on the World Wide Web. A URL is a type of URI - universal resource identifier. A typical URL consists of:

1) a network protocol for obtaining a resource (e.g. <http://>, <mailto:>, <telnet://>, or <ftp://>)

- 2) a complete search path starting with a site's domain name (e.g. `www.lisp.wayne.edu`)
- 3) possibly, one or more directory names and a filename at the site (e.g. `/csyed.html`)

A site's domain name is like a personal or company name in a telephone directory. Like telephones, each machine on the Net has a number, called an "Internet Protocol (IP) Address". An example of an such an address is "141.217.97.3", a number not likely to occur readily to a human user. Scattered around the Net, machines called Domain Name Servers (DNSs), maintain copies of this vast directory and facilitate lookups. Sometimes, a particular machine number may have several aliases. For instance, the names "valinor.purdy.wayne.edu", and "lisp78.purdy.wayne.edu", both refer to the same IP address.

Moreover, it is important to remember that many of the books about the Net originate in the United States, and usually provide domestic conventions. The principal divisions, called "upper level domain names", given even in canonical books like Krol's *Whole Internet*, are often taken as invariable by newcomers to the net. But anyone who has examined the URLs of more than a handful of sites, knows that not all of them end in ".com", ".mil", ".gov", ".org", or ".edu". Outside the USA, most countries maintain their own network governance structures, and assign domain names based on two-letter country codes, such as ".ca", ".au", or ".ch".

For information intermediaries, a knowledge of URLs is paramount. If you understand URLs and the domain name system, you will usually be able to identify the origin of a Web page or of a piece of email which you have received. An intermediary who is reasonably certain of the origin of information may be in a better position to assess its quality and authenticity. A user who understands URLs and the domain name system, may be able to "guess" the likely names of sites, thereby reducing the amount of time spent using search engines. An understanding of URLs, of the domain name system, and of the file structures and file types used on the Net, is beneficial to the users of, and crucial to the designers of network information.

However, verifying the origin of a message does not guarantee either its accuracy, or the credentials of the originator. A message originating from "mit.edu" might have been created by a professor of astrophysics, an undergraduate in creative writing, or a groundskeeper who is experimenting with the Net. Conversely, the groundskeeper might be a bona fide member of her local amateur astronomy club, and – like many non-academic astronomers – an acknowledged expert on comets or planetary observing. It is therefore incumbent upon reference librarians to become conversant with the Web sites, Newsgroups, and LISTSERVs frequented by users in their subject fields, and to recognize the "net.personalities" who habitually post reliable information in them.

So far, we have been discussing information which can be obtained from the headers of messages. However, additional clues to the accuracy and authority of the information must be gleaned from the text itself. Perhaps nowhere on the Net is the disinformative, the spurious, the suspect, more likely than in the Ufology Newsgroups, such as alt.alien.visitors, alt.conspiracy, alt.alien.research, and the like. One of the most popular constructs of this genre is the "Majestic" theory, which is premised on the notion of a super-secret group within the intelligence community charged with concealing the presence of extraterrestrial visitors to Earth. Based on archival material available at the "Wiretap Project", <<ftp://wiretap.spies.com>>, we can piece together a canonical version of the "Majestic" theory.

According to its proponents, Earth has been visited at least since the Second World War, by a race of aliens known as the Greys. In response to incidents of the early 1950s, a super secret group known as the Maji or as the Majestic 12, or MJ-12, was created to investigate and to control the situation. Their documents are labeled "TOP SECRET MAJIC", and they have access to limitless resources and intelligence. They have used genetic engineering to cross-breed humans with Greys, and have in all likelihood created a group of hybrid clones known as the Men In Black. The Greys may not be naturally malevolent, since the First Nations knew them as kindly visitors. It is possible that the Greys have fallen under the control of another malevolent race.

The Wiretap versions of several of the Majestic documents contain interesting disclaimers, suggesting the possibility not only of systematic disinformation, but also of 'counter-disinformation'. The preamble to one series of documents suggests:

The "author" of this work, "O. H. Krill" is believed to have been a joint effort ... to "smoke out the disinformants in the field". For many of us who have been into this field for awhile, this file is held in low esteem.

The notion that the document was created to smoke out disinformants bears some consideration. For instance, it names Henry Kissenger as one of the original Majestic 12, formed in 1952. At that time, Kissenger, a man in his thirties, was a mere Teaching Fellow at Harvard. He was not to reach prominence for almost two decades.

The most obvious possibility is that the Majestic literature is the work of sincere but misguided individuals. A second possibility is that it is a clever work of mischief. Or, it could be a product of paranoia. A fourth possibility is that the story is true, and the preamble mentioned is itself deliberate disinformation. Science rests upon verifiability, replication, truth-telling. Given the maze of accusations and counter accusations, and the absence of peer review and vetting, one would be hard pressed to pass judgement on such sources. It is noteworthy that the Wiretap archives have placed the documents in a directory called "Fringe".

What is of interest here is the interplay between network traffic and other components of popular culture such as television and film. Many of the components of this theory have been used to good effect as plot elements in the popular television series, *The X-Files* (20th Century Fox, 1993). A short-lived series *Dark Skies*, which aired in the mid 1990s, told the tale of an agent who had defected from Majestic. The series suggested that Robert Kennedy had been murdered because he was about to go public with the Majestic material (Columbia Pictures 1996). The series' opening credit sequence includes a close shot of a document marked "TOP SECRET MAJIC", and a book bearing that title (Friedman 1996), has been treated seriously in library and book trade reviewing sources (Barber 1996, Eberhart 1996).

How is a librarian to judge the relevance of such documents for a client? It may be objected that we do not pass judgement upon articles appearing in print media such as supermarket tabloids, nor do we necessarily steer people away from mass market literature in general. However, one can usually infer from the appearance and layout of print material some things about its quality. Peer reviewed journals are easily distinguished from popular periodicals, and from supermarket tabloids. A librarian concerned with credibility can point out these design features without risk of appearing biased. The publishing process stands behind the print process, as the apparatus of film, television, and radio production stand behind the artifacts of those media. This is not the case with material from the Net, or from the Web.

With the elimination of the editorial process, characteristic of every other mass communications medium, the Net has perhaps enhanced the chances of achieving global, immediate, and truly democratic communication. It has also placed a greater burden upon information intermediaries such as librarians, archivists, and information scientists. Where a cursory examination of a publication's layout, title page, contents, and references might suffice for determining the credibility of publications in other media, an in depth examination of the contents of Network artifacts is sometimes necessary.

Clues to the authenticity and credibility of an email message, a network news posting, or a Web page may be gleaned from its apparent grammatical sophistication, the presence or absence of verifiable citations, the author's familiarity with the medium of communication, and the author's use of jargon appropriate to the subject at hand. Additional clues may include the author's reputation in the field, which can sometimes be determined by the reaction of other readers, or inferred from citation counts derived from search engines. Such detailed analysis is beyond the traditional purview of the profession.

Librarians face yet another challenge from the Net. Since time immemorial, the materials contained in libraries and archives have been categorized, arranged, classified, or catalogued. Such organization imposes meaning upon otherwise random and chaotic collections of

data and information. To borrow a notion from General System Theory, we might say that a set of "emergent" meanings obtain from an organized collection of knowledge, that is, that additional meanings can be gleaned from the organized whole, which did not obtain from an examination of its parts. We know, for example, that there exists a discipline called 'astrophysics' and that certain works are part of its canon, by the fact that such works appear near one another on the shelves. This process of categorization has been one of the strengths of our profession, perhaps even one of its trade secrets, at least since the middle ages. The other great pillar of the profession, information retrieval, has depended to a large measure upon this underlying process. The Net, and the Web, and the popularity of keyword searching, pose grave challenges to these traditional strengths.

The Net may mean the end of librarianship as we have known it, and the beginning of a new age of confusion of ideas. But there is a graver consequence looming on the electronic horizon than the displacement of a relatively small number of professionals.

McLuhan suggested that when examining any medium or technology, we ask several stock questions: What does it extend or enhance? What does it render obsolete? What does it retrieve from the past? What does it produce or become when pressed to an extreme, i.e. if dialectically reversed? (McLuhan 1988). We have dealt in some measure with the first two. In passing, we might observe, along with Thom Gillespie, that the prevalence of icons on the Web, calls to mind "the cave walls of Altamira and Lascaux...covered with pictographic drawings that even today we can recognize." (Gillespie 1993). If carried to its logical extreme, an unmoderated Net produces the end of science or scholarship, due to an unpredictable mingling of pseudo-science and opinion with the products of scholarly research.

Science, scientia, or the quest for knowledge in its broad sense, depends upon scientists' telling the truth as they see it, of documenting their apparatus and methods, and of providing means of verification. When these controls are absent, or difficult to discern, in a world in which it is increasingly difficult to judge the relative merit

of ideas, ideas themselves become valueless. In a world in which the medium of expression is valued as highly as its contents, impressions alone will remain.

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