WEB DESIGN AND DESTRUCTION

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ABSTRACT

This paper notes the ineffectualness of organizational World Wide Web sites which are generally supportive of nuclear science and technology versus those whose mission is to oppose nuclear matters and which do so by providing mis-information to the public. Specific comparisons of pro and con sites are made, and recommendations are made for improving the Communication effectiveness of proponent sites.

KICK-OFF

We are losing the match—on our own playing field.

The Internet and its graphic World Wide Web began as a result of initiatives in CERN—an international nuclear site. Its capabilities were developed through the efforts of mathematicians and computer scientists in universities and nuclear laboratories. It is a wonderful medium: still in its infancy as it reaches towards the multimedia horizon. It should be a matter of pride to all of us, equal to our pride in any pure nuclear scientific or technological discovery. Yet, within this medium—virtually our own medium—nuclear science and technology is suffering defeat.

Opponents of Nuclear Science and Technology are using the web exceedingly well to misinform the web public while we, the proponents of the technology, are unable to provide opposing viewpoints effectively.

COST OF ENTRANCE

How much does it cost to play this game?

Do not underestimate the costs. Any organization or company must first define its objectives: whether it is selling a service, a product or whether its site is to improve public understanding. A product advertising approach is much easier and less expensive because the audience is well-defined and the effectiveness of the site can easily be measured. Creating public understanding and acceptance of nuclear science and technology is different, more difficult and cannot be measured accurately. It may cost a lot more.

Commercial companies can immediately approach professional publication companies where the cost of a team of web site developers, graphic artists, computer scientists, and data base specialists can cost the world. Costs for this sort of professional help can range as widely as any advertising corporation's assistance. The Web price index (Siegel, 1997 p. 152) shows that professionally-developed sites, depending on the size, can range from $10,000 to $570,000.

However, typically, an engineering association or nuclear society will assume that its engineering volunteers, or staff within a company, have all the skills necessary to produce an effective Web site to provide information for the public. The cost are then minimal but the results can also appear to be minimal—because the association has typically misunderstood the game and its realities.

Greenpeace has the income of a large corporation, so it has the ability to hire professionals. There are no figures on what they spend but their web site is no amateur construction. If the competition is professional then the pro-nuclear organizations must also be professional. Excellent advice on the management of web

development projects is provided by David Siegel in his latest offering (Siegel, 1997). He provides a series of case studies of successful and not-so-successful web development projects.

However, the bottom line on costs is that, whatever one pays, if the site is not well-designed to communicate with its chosen audience then you might as well throw the money down the drain. You may actually be doing harm with a poor communication site.

THE PLAYING FIELD

Anyone can place information on the Web, for the use of anyone else who has access. Very little is restricted. It is the biggest free library anywhere. Furthermore, just as in a library, where the visitor's hand-picks out the nearest and most attractive book within reach—in web terms, the browser reaches for those sites that are easily available and stays in those which offer attractive content. These are not great conclusions, but the nuclear community doesn't seem to understand what they mean or how to play according to these 'rules'.

There is one difference between a library and the Web—no one can control its contents. The traditional librarian ensures that the Classics and a comprehensive set of reference material are included on the library shelves, while obvious trash is excluded. However, the Web has no 'librarian'. Anyone can add anything: so that the Web's contents range from serious and intelligent texts through reference information, to the pornography of communication—half-truths and willful lies. Yet, there is no arbiter to which one can cry 'Foul!' and it is rarely possible to complain directly to the offending site. So, we have a responsibility to play the game on the playing-field that we created—by competing for the hand reaching for the 'book' and by persuading the reader to read more than the first few words.

THE COMPETITORS

Greenpeace knows how to play the game in competing for the public's attention. The Greenpeace Web site entrance is quickly downloaded for the curious browser. The colorful opening page looks simple, but it is full of subtle links to a wealth of misinformation on all matter of issues. The first links are to issue pages. Each issue page is short and hard-hitting—the browser has no chance of missing the message. We may complain at half-truths and misinformation but the cause justifies the means. The Greenpeace message is never in doubt. The site has been crafted for the job it does so well—to convey information to a curious browser and then to persuade him or her to stay and read more. It is an excellent communication tool, since it is visible on all monitors with any software and it does not overwhelm the visitor.

Contrast this site with typical nuclear organizational offerings. The sites are generally developed, with the best will in the world, by engineers who cannot even spell 'communication'—the sites follow engineering rules. There is often no objective other than showing how much the developer knows. Everything must be accurate and complete, more words are better than fewer, so that long pages scroll endlessly. It reminds one of the questioning child who, on being told by her Mother to go and ask Father, responds "Oh, No! He always tells me more than I want to know." Then of course, the Webmaster's familiarity with the latest Web technology has to be obvious—pages are full of text barely visible over complex backgrounds while animated 'GIFs' are scattered like obstructions in a pathway. There is rarely a clear message. Engineering Web sites usually overwhelm the browser. who leaves as fast as the click of a button. Any attempt at communication has failed. We manage to speak accurately, at length, without a word being heard.

For example, the Nuclear Regulatory Commission (NRC), whose public image is defined by two recent Time Magazine articles, does provide a reasonably gradual entry to its site. That is as good as its design gets. The majority of the NRC site (NRC, 1997) is a bland and boring first-generation site, with long scrolled pages separated by horizontal lines, with a confusion of links to other pages. This material has not been updated for many months. At best, this is a historical reference site. In response to the defamation of

its public image, the web site provides no clear statement that it performs its regulatory function efficiently and in the public interest, but at the third level in the site the NRC provides a "*Public Citizen's Guide to NRC*" page. One might expect some proponent text but apparently these pages have not been updated since May 1995. Thus, the public image remains the inefficient regulator defined by the sensationalist press.

The Department of Energy (DOE) site (DOE, 1997) is another first-generation site. It has no entryway. It throws everything at the browser in one confusing set of organizational links. Its priorities (as at November 1997) were Contract Reform, Strategic Planning, and its Performance Report to the President. Yet, the DOE also has a severe public perception problem arising from its mismanagement of residual wastes of the cold-war program. Formally, it has undertaken to address this problem through attention to Stakeholder Groups around its US sites. Therefore, one might expect appropriate attention to Stakeholders on its web site. However, while the DOE is a not a proponent of nuclear science and technology, neither does it protect its own reputation in any way on its site. The closest item to public communication appears to be the ESTEEM program of education. But you would never guess this was a positive program.

Engineering and Scientific Society sites are not much better. One only has to browse the sites to see this.

The American Dietetic Society (ADS, 1997) has a policy statement on Food Irradiation which is admirable. It is three lines long, but their web page is a very long listing of background information best suited for other background pages. Thus, the subsequent links are lost at the bottom of something the average browser would never scroll. On the other hand, the Health Physics Society (HPS, 1997) provides all the background information up-front and it takes persistence to see what this Society's policy is with regard to food irradiation. On the other hand opponents' sites are quite happy to preempt all background information with the statement that "Food Irradiation is unsafe and can cause cancer." Who would the uninformed believe? Who wins the game?

If the nuclear community is to win the competition for the browser's understanding, it will have to play within the rules of the game. We have to provide succinct positive messages and we will have to abandon some previous ideas of purity. For example, we need to abandon the idea that when Greenpeace says "nuclear power is unsafe", the nuclear community is more believable if we say "there is only a probability of 10^{-6}/annum that nuclear power is unsafe". "Nuclear power is safe" is the message.

GAME EQUIPMENT

Web pages are viewed through a browser's own monitor, not the web developer's 22" monitor. The browser's monitor may only have a 7" screen or smaller, forcing compulsory scrolling for longer text. So, the Web-site developer should design short messages to be seen fully within a smaller page. Greenpeace does just that, by preparing pages for the least capable monitor.

Furthermore, Web pages are viewed through a browser's own software, which might not be able to see frames, experience animation, or be compatible with audio or video presentations. It may use its own default fonts and background. It is as if the book you wrote in English will only be seen by a reader, on microfilm, in Hindi. This means that Web pages must accommodate the least capable browsing software and should be tested on all browsing software before release.

It is fun to develop and to manipulate colored files in *Photoshop* to produce elaborate GIFs but if they are over 40-kb and your visiting browser possesses only a modem with minimal speed, he or she will quickly leave the site before your beautiful GIF has down-loaded. Your own ability to see your pages quickly does not guarantee that the browser will. So you need to use a few tricks to make down-loading appear rapid.

As one example, if you need a vital but complex GIF, which cannot be compacted to a reasonable size, you should provide an earlier page to pre-load the image. The prior page must have text worth reading so that

the browser is persuaded to stay for a while. Then, while the browser is reading, the GIF can be downloaded invisibly in the background by adding it to the page as a hardly-noticeable single-pixel. Thus, while the browser is reading the prior page, the complex GIF can be downloaded in advance of moving to the following page, from the 'period' at the end of the page.

Formatting pages by using tables and frames is wonderfully convenient but some browsers cannot see them. *Netscape* first developed frames, but it took *Microsoft Explorer* many months to catch up. Java sub-programs, Java applets, web-maps, and animations, are neat to produce, and, as engineers, we love to demonstrate technical skills, but if the browser cannot see them or simply sees nasty little substitute icons, the technical innovations achieve little. They should never be used unless they contribute coherently to the communication.

At one time, some browsers could see nothing more than text. Professional sites usually provided a text-only link to simple non-graphic pages. However, the number of graphically-handicapped browsers has dropped to less than 2% of the total, so that adding the complexity of a text-only option is no longer worth the trouble. The same popularity of other new Web capabilities will come about in the future. Presently, web-maps have almost universal acceptance. However, many browsers, for example, are not Java-compatible (Davies, 1996) Thus, if you want an efficient web-site to be seen by everyone, you should avoid using the latest Web techniques or provide alternative paths for the less-capably equipped browsers. After all, the objective is to win the nuclear-understanding game not to construct web games.

PLAYING FOR THE AUDIENCE

In some engineering web sites (as in the agency sites), one is often met by the requisite company or association logo, followed by endless text stretching below your horizon on the monitor—and below your level of interest. The text can be as boring as a lecture or can bristle with Corporate pride and arrogance. These sites are worth leaving quickly without a bookmark.

David Siegel (Siegel, 1996) likens a successful web site to a warm and attractive restaurant. First, a few lights and a distantly-perceived warm interior. Then a welcoming face and the experience of being conducted to a clean and well-set table. The wine and entree menus are offered, the day's specials are outlined and then you are left to compose your own meal from the offerings—eating as little or as much as you like. Finally, the offer of desert, and a welcome to return as often as you like.

Well-run restaurants do not try to overwhelm you at the door; they do not try to make you eat everything; and they make the food palatable. Web sites should be constructed to almost the same playing rules.

There is nothing unique about the pathway into a site but successful ones do show some common features:

- First, a splash page with little other than a front-door and the minimum of text—an innovative company product, or an association initiative, can be more effective than a logo as an introductory image. Even the white-house knows that a picture of the White House is more evocative than the Seal of the United States.
- The splash page is followed automatically within seconds by an entrance-way with three or four main welcoming or intriguing doors—no lecturing yet. This is just the main menu—the page where you invite the browser to bookmark.
- At each doorway entrance, a few sentences convey the main message. Links to relevant deeper material are provided for anyone who needs to know more.

  This is where one says clearly, "Nuclear Power is safe and clean", "Sterilization of food by ionization will save hundreds of lives a year", and "Nuclear medicine saves lives." Leave the 10^{-6} equivocation to the deeper material for the browser to read.

- Framing the information in readable chunks allows quicker down-loading since the heading and the link frames remain in place. The browser gets to everything quickly.
- All pages should provide a return path to the main menu in case the browser has chosen the wrong subject.
- More extensive material can be offered on a range of subjects, but there should be also clearly marked escape links for the browser who "doesn't want to be told more than he or she wants to know." These escape links lead to attractive close-out pages which provide easy bridges to other sites as well as a return to the original menu.
- The deeper optional level material can be as extensive, and as fully referenced as the designer wants, although it should be available in small readable chunks.
- The whole site must be finally approved by a Communication scientist—someone who has been trained to understand how readers react to words and phrases.

HALF-TIME

Web sites must be up to date.

No person would return to a game if the second period was destined to be an identical repeat of the first. Thus, successful web sites must be current and be visibly updated, often.

This is another difference between a web site and a traditional library. It is difficult to update the latter although good librarians always highlight recent arrivals for their readers. However, the web can be maintained absolutely current. It only takes a little attention.

The least one can do at the web site is to include the date of the last revision of material; the best one can do is to revise the entire format and image of the site on a periodic basis. In between these extremes, the web site might include trivia, questions, or contests which are changed frequently. Browsers want to see new material, not a recognizably static uncared-for site. At the very least, the browser needs to be attracted to return after half time.

THE NEXT MATCH

A restaurant will die without return business. Winning the web game depends on browsers being willing to return. How do you get browsers to return?

There are at least two methods: the most obvious is the attractiveness, novelty, and changing image of the site, so that updating the site is a necessity. The second, and more compelling, reason is the utility of the site: does the site offer ongoing advice, useful links, or updated data. I return to my favorite sites showing the current weather and stock exchange details on a daily basis. Thus, in developing the Web one needs to consider what will bring the browser back—perhaps a daily, angry, and almost libelous blast at the National Resource Defense Council or the absurdity of global warming(?) might do it !

I have experience with a number of sites offering information in small chunks. I include push-buttons, saying PUSH, that provide me with the visitor's e-mail address. I always respond with a welcoming e-mail message and many of these browsers have become regular return visitors. Some have asked for supplementary information, and I am happy to provide it.

AFTER THE GAME ANALYSIS

What have I told you?

I have asked you to view your web site through the eyes of the visiting browser who needs web sites free of technical handicaps, information which is clear and unambiguous, and sites that are worth coming back to. This means that you should:

- develop a web site that every browser can visit and see, whatever their hardware or software happens to be,
- make your main messages short, unequivocal and readily seen,
- make your site attractive to visit and to delve into, for as much or little as the browser wishes to see,
- employ a Communication scientist to make the site, and its text, understandable to the public other than engineers,
- at all costs, avoid excessive information, massive bibliographies, irrelevant information, arrogance, technical and corporate pride, and, above all, sterile information waived by footnoted reservations, and
- maintain, update and revise the web site regularly to attract the browser to return.

This may take more funds and more focused attention to the project than you expect.

THE FINAL WHISTLE

When I want information in this day and age, I do not go to the library, I go to the Internet World Wide Web. I revisit reliable sites where I know can find succinct current information with background if I need it. Some of the sites I visit are updated within minutes of a change in the information. Out-dated sites I avoid. I would not return to a site that has not been reviewed for six months on a medium that can be updated daily.

If I, as a person unfamiliar with nuclear science and technology, wanted nuclear information I might well go to a bookmarked Greenpeace site because I know that current issues will be addressed and I will get a short, but firm, opinion on the subject. Being unfamiliar with nuclear science and technology I would perhaps adopt that opinion, because there is no alternative.

We need to create proponent nuclear sites which can attract browsers on the same basis because otherwise we are losing the game. I am glad to say that some American Nuclear Society communication and nuclear enthusiasts are developing the *GO-Nuke* site (Wilson, 1997). The site's only purpose is to be proactive and up-to-date in its support of Nuclear Science and Technology. You should visit it. This could be a game winner.

REFERENCES

Davies, O., T. McGinn and A. Bhatiani. "Instant Java Applets" Ziff-Davies, Emeryville, Ca. 1996

American Dietetic Society (ADS) <http://www.eatright.org/airradi.html > November 1997

Department of Energy (DOE) <http://www.doe.gov> November 1997

Health Physics Society (HPS) <http://www.hps.org:80/food.html> November 1997

Nuclear Regulatory Commission (NRC) <http://www.nrc.gov> November 1997

Siegel, David. “Creating Killer Web Sites” Hayden Books, Indianapolis, In. 1996.

Siegel, David. “Secrets of Successful Web Sites” Hayden Books, Indianapolis, In. 1997

Siegel, David. “Secrets of Successful Web Sites” Hayden Books, Indianapolis, In. 1997, *p. 152*

Wilson, Paul. “Go-Nuke” <http://maple.fzk.de/~wilson/projects/gonuke/> November 1997

KEY WORDS

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