Electronic presentation styles of corporate sustainability information and how they reflect the quality of reporting

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Abstract

The environmental and social information available from web sites of all 95 firms in the 2003 Fortune Global 500 and Fortune 1000 chemical, electronics, and pharmaceutical sectors were analyzed with respect to quality of reporting relative to web presentation style. Quality of reporting was analyzed using the Pacific Sustainability Index (PSI) which assesses coverage of 140 environmental and social topics. Presentation styles were categorized as *ad hoc* (isolated relevant web pages), non-linear hyperlinked web pages (intended as formal environmental or sustainability reporting but not formatted as print-style reports), formal reports directly converted from print to electronic form (usually PDF), and enhanced converted-from-print embodying hyperlinks and other web-specific features. PSI scores were highest for reports that were converted from print, particularly when enhanced with web features. The latter presentation style was adopted by the largest companies, so that quality may be as much a reflection of resources as of choice of presentation styles. Nevertheless, it is clear that print, even though delivered by internet and often accompanied by an HTML version with similar or identical information, remains a presentation medium of choice for the largest companies and produces the best reports.

1. Introduction

It should not be surprising that the internet has rapidly become the universal distribution medium for corporate information. All print materials are now constructed electronically and are almost as easily output to the internet as they are to printers, at a tiny fraction of the cost, and without the need for paper, binding, handling, or postage. Users can view everything and print what they need. Furthermore, the internet format allows many types of enhancements, including essentially unlimited supplementary material and updates, search engines, hyperlinks, audio, and video, and real-time feedback. It also allows distributed content generation—far-flung operations can develop their own web pages and have them hyperlinked to the corporate site, or even serve them independently. The potential of these enhancements has sparked enormous interest (ACCA, 2001; Arndt/Gunther, 2004; Cerin, 2002; Gómez/Isenmann, 2004; Isenmann, 2004; Isenmann/Lenz, 2000, 2001, 2002; Jones *et al.*, 1999; Jones *et al.*, 1998; Jones/Walton, 1999; Kolk, 1999b) and led to predictions of the demise of the printed report (Wheeler/Elkington, 2001).

In addition to the enhancements offered by web-based delivery of environmental and sustainability reporting, many of its supporters envision that eventually such reports will be generated directly from electronic data sources using detailed extensible markup language (XML) tags and topic maps (Arndt/Gunther, 2004) with automated internal data processing (Gómez, 2004). Such reports could be customized and generated on the fly in response to individual users' needs (Brosowski/Lenz, 2004), and can be output as hypertext markup language (HTML) with multiple linking, complex hypertext structure, and a cross media focus (Isenmann, 2004) or in portable document format

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(PDF) for direct printing. So far, however, most companies with formal environmental or sustainability reports continue to design them as print media, even though delivering them on the web (Isenmann, 2004) and often in hard copy as well.

Why are companies still "…stuck in the rut of…the printed page" (Elkington/Priddy, 1997)? One reason is, paradoxically, ease of use on the part of readers: print is a finely honed medium with which every educated person is thoroughly familiar. Although it is possible to view a printed environmental or sustainability report as an inherently unsatisfactory compromise (Isenmann, 2004), it is equally possible to view it as a highly organized set of relevant information, clearly presented, tightly edited, and elegantly formatted. The best reports meet these criteria and led one of us, after viewing hundreds of confusingly hyperlinked environmental web pages—many of which print out badly, truncating the right-hand ends of sentences—to recommend that companies opt for printed reports and make their web versions easily navigable and printer-friendly (Morhardt, 2002).

A convergence of the discipline of print and the flexibility of hyperlinks and data-on-demand seems highly desirable in environmental and sustainability reporting. With its ability to simultaneously specify content for both hyperlinked web pages and high quality printed documents, XML may be able to drive such a convergence. Although a universal standardized approach to environmental reporting seems attractive to some (CERES, 1999; Global Reporting Initiative, 2002; Steven, 2004), the standardization needed for ICT-based reporting clearly need not extend beyond an individual organization.

In this paper we make a quantitative assessment of the information content of print-based environmental and sustainability reporting delivered by internet vis-à-vis the information content of environmental and sustainability web pages not organized as print-based reports. Our goal is to assess the extent to which the current round of reporting by the largest companies, in this case in the consumer electronics, chemical manufacturing, and pharmaceutical industries, utilizes various internet technologies, and whether there is a difference in the quality of the reporting when using a print-based approach.

2.   Methodology

To assess the information content of environmental and sustainability reports on the web we used the Pacific Sustainability Index (PSI) (Morhardt, 2002), the score of which reflects coverage of a combination of environmental and social topics characteristically found in sustainability reports. The information we analyzed for this paper includes all of the relevant material on the world wide web for all 95 companies listed in the 2003 Fortune Global 500 and Fortune 1000 lists (Fortune Magazine, 2004) in the chemical, electronics, and pharmaceutical sectors.

Other results from this analysis are reported elsewhere (Morhardt *et al.*, 2004a; Morhardt *et al.*, 2004b; Morhardt *et al.*, 2004c). We also compared the PSI scores to another measure of information content; number of words.

We then characterized the material on each web site as falling into one of four reporting categories:

1. Informal *ad hoc* web pages—not intended as a formal environmental or sustainability report, but useable to some extent as such. These include the environmental section of 10-K reports, environmental or social policies, and other relevant information. This category is intended to make a distinction between companies that present some isolated environmental or social information and those in Category 2 below that have in mind a formal environmental or sustainability report, but not one that is formatted for print.

2. Formal, non-linear hyperlinked—intended as a formal environmental or sustainability report, but organized as a series of hyperlinked pages in no particular order, often with dynamic online features. This is approximately equivalent to the Association of Chartered Accountants (ACCA) "standalone" category (ACCA, 2001)

3. Formal, directly converted from print—direct conversion of a print-style report to electronic form such as PDF or other printable format. This is identical to the ACCA "piggy-back" category (ACCA, 2001).

4. Formal, enhanced conversion from print—converted directly from print, but with enhancements such as hyperlinked tables of contents, external hyperlinks, audio and video clips, forums and bulletin boards, feed-

back forms, search functions, and pull-down menus in the web version. This is similar to the ACCA "integrated" category. In many cases web sites in this category have parallel, often identical, material in both PDF format for downloading and in HTML or XML format for viewing online. These sites could store the information in XML format and generate both HTML and PDF documents from the same data (Arndt/Gunther, 2004; Brosowski/Lenz, 2004).

We then related these reporting styles to PSI score, company size (using revenues reported in the Fortune lists), number of enhancement types (hyperlinks, audio, video, feedback forms, etc.) as a sort of index of level of web sophistication, and to whether or not there was a site map that allowed comprehensive navigation. Finally, in an attempt to assess the use of XML in the current round of reports, we viewed the source code of all web pages for presence of an XML declaration.

3.   Results and Discussion

3.1   Quality of Reporting

There have been many approaches to characterizing the quality of environmental and sustainability reporting. Some have been created from scratch (Davis-Walling/Batterman, 1997; Deloitte Touche Tohmatsu 1999; SustainAbility/UNEP, 1996, 1997, 2000) and have been subsequently analyzed in detail by independent researchers (Kolk, 1999a; Morhardt, 2001, 2002; Morhardt *et al.*, 2002). The method used in the analysis in this paper, the PSI (Morhardt, 2002), was developed from report writing and content guidelines including the GRI 2002 guidelines (Global Reporting Initiative, 2002), the ISO 14031 guidelines (ISO, 1999), and the SA8000 guidelines (Social Accountability International, 1997).

The numerical values of the PSI scores are best viewed as relative levels of environmental and social intent, transparency, and performance. The maximum score for this group of 95 companies is 56, and average score is 19. The top score reflects a high level of communicated intent to report, as well as a high level of transparency. There is a strong and highly significant correlation between the number of words in the reports or web pages and the overall PSI score (Figure 1), but there is also considerable variability: LG Electronics' report, for example, achieved a higher score than Sony's with a third as many words, and Sumitomo's report had nearly the highest score while Tyco's, with a similar word count, had one of the lowest. Part of this variation is a result of efficient use of data graphs and tables which can transmit considerable information with few words. Another part is the use in some reports of multiple examples of the same general phenomena—the PSI gives a maximum score for a particular topic based on one or two examples, giving no additional credit for more examples. Some companies devote many pages to examples of product ecoefficiency or volunteer environmental cleanup, whereas an example or two would achieve the maximum possible PSI score for that topic. In those instances, number of words might be considered a better indicator of information content than the PSI score.

3.2   Internet approach

3.2.1 Reporting strategy

In order to compare information content with reporting strategy, we subdivided the reports into three approximately equally sized groups based on PSI scores and characterized them as scoring low, medium, or high (Table 1a). Informal *ad hoc* pages scored less well than non-linear hyperlinked pages, which in turn scored less well than reports di-

rectly converted from print. The highest scoring reports are those that appear to have been converted from print then enhanced with both internal and external hyperlinks and other internet-compatible features not possible in print.
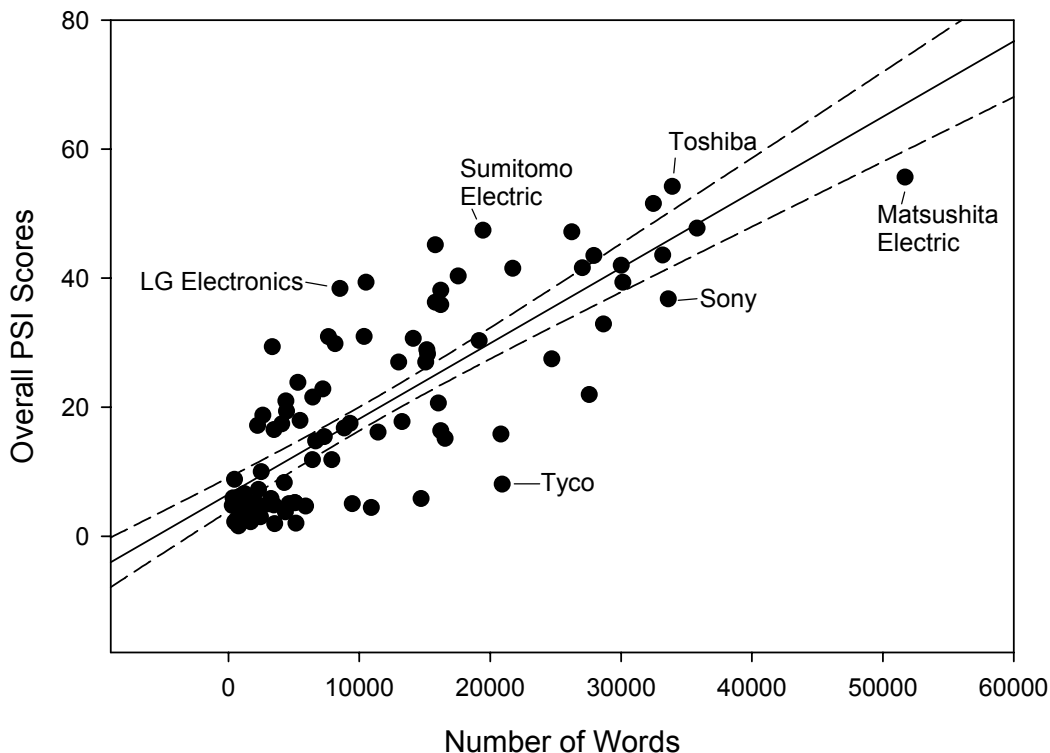

Figure 1

The relationship between number of words in environmental or sustainability reports, or in relevant web pages, and overall PSI scores. Dashed lines indicate 95% confidence intervals. (r^2=0.66, P <0.0001)

   It is not obvious why parts of this hierarchy should exist. One might well expect that carefully linked pages never designed for print would carry every bit as much information as pages converted from print. That is the promise of the multimedia open-ended database-driven information revolution offered by internet servers. The answer probably lies in the fact that there is also a strong relationship between the size of the company and the chosen web format: the largest companies generally choose to prepare their environmental and sustainability reports in printed form, and then to serve them to the web in PDF format, often accompanied with a parallel HTML site with various enhancements (Figure 2). Large firms apparently want printed (or at least printable) copies to distribute, even though they are also potent users of web technology, and often simultaneously use many of the enhancements available online.

3.2.2 Types of enhancements

As a simple index of internet sophistication, we counted the numbers of types of enhancement on each web site. These included internal and external hyperlinks, audio and video clips, forums and bulletin boards, feedback forms, search functions, and pull-down menus. Table 1b shows that there is little relationship between the PSI scores and the numbers of enhancement types. We speculate that once a web designer begins to implement enhancements, the

number of types is more a function of the skills and philosophy of the designer than of the content of the environmental or sustainability reports.

Internet Approach	Numbers of Reports in the Three PSI Score Categories			
	Low	Medium	High	Total
a. Reporting Strategy				
Informal *ad hoc* web pages	22	4	0	26
Formal, non-linear hyperlinked	9	15	2	26
Formal, converted from print directly	1	12	10	23
Formal, converted from print, enhanced	0	2	18	20
Total	32	33	30	95
b. Number of enhancement types				
None	3	1	0	4
One	6	4	4	14
Two	11	16	17	44
Three or more	12	12	9	33
Total	32	33	30	95
c. Use of site maps				
No site map	15	9	10	34
Site map	17	24	20	61
Total	32	33	30	95

Table 1

The relationship between overall PSI scores and reporting strategy, number of enhancement types, and the use of site maps in environmental or sustainability reports.

3.2.3 Use of site maps

Sixty-four percent of our sample (61 companies) provide a detailed site map of their environmental or sustainability web site, but there is no relationship between the inclusion of a site map and the PSI score (Table 1c)—hence ease of navigation which is certainly enhanced by having a site map, appears to be the province of the web designer rather than of the content providers. Site maps, however, often deal with far more than the environmental and social aspects of a site, and the decision of whether or not to use them is probably often independent of the environmental or sustainability report.

3.2.4 Existing utilization of XML Programming

We found XML tags in the environmental or sustainability reports of only Akzo Nobel, Allergan, AstraZeneca, Bristol-Myers Squibb Company, and Dow Chemical. Biogen uses XML tags in their corporate web site but presents no environmental or sustainability report. It appears that the use of XML tags for online environmental reporting is still in its embryonic stages, or that XML source material is converted to HTML format prior to presentation on the web.

4. Conclusions

The web has indeed become a powerful disseminator of corporate information, including environmental and sustainability information—but not to the exclusion of print formats. As this paper shows, the most information-rich web sites are those that appear to be converted from print and presented in a form that can be printed out as a formal report, whether or not the company actually made a print run of its own. We think there are two reasons for this: 1)

print is highly intuitive—our educational systems are based on it and all educated readers can assess its quality and extract information from it with ease, and 2) print is a highly evolved discipline—writers, editors, photographers, and illustrators all know what works and that they must make every page count. On the other hand, *ad hoc* hyperlinked pages are often of distributed origin—different operations put in what they want and the whole thing gets hyperlinked together, with nobody properly editing the site as a whole for balance, consistency, and completeness.
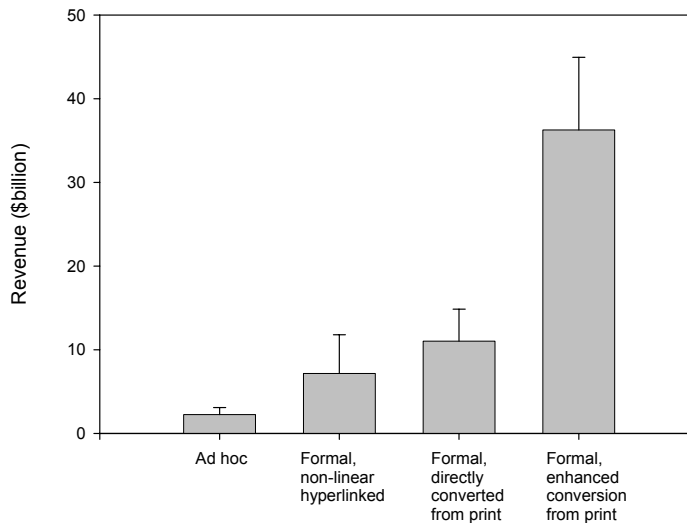

Figure 2
The relationship between reporting strategy and corporate revenue.

Many of the best print-style reports, moreover, are accompanied by a parallel HTML or XML version with many of the enhancements that are available on the web. These sites achieve the advantages both of print and of electronic media, and some may store their underlying information in XML format for conversion to HTML and PDF formats.

Mass customization, individualization, and personalization on the web are certainly feasible: Amazon.com does an excellent job of providing just the information a customer wants. Once it becomes clearer what consumers of corporate environmental and social information want, these customization techniques will doubtless emerge in environmental and sustainability reporting. There is little sign of them yet.

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