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Corporate Governance, the Environment, and the Internet

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Corporate use of the Internet for a variety of business purposes is now commonplace. Owning and occupying Internet space is almost essential for publicly traded companies, either as a place to do business or as a place to exchange information about business. It has also been documented that the Internet provides a global meeting ground for those interested in social and environmental change. The two ideas are now combining, leading to a situation in which corporations are using their Web pages to provide environmental information about their activities as part of their corporate governance strategy. This paper performs an initial investigation into the ways that some Australian publicly listed companies are using the Internet to disclose environmental information. As the research is an exploratory investigation into environmental disclosures on the Web, our first consideration was to see whether the environment featured on a company's Website, how it featured and the ease to which this information could be accessed. Overall, this study indicates that environmental disclosures are highly dependent on industry. More importantly, it was found that the type of disclosure does not vary significantly from that provided within text-based reports and that Web-based media is still far from being utilized to its full potential.

Definitions of corporate governance have been hotly debated within the literature (Shleifer & Vishny, 1997; Bradley, Schipani, Sundaram, Walsh, 1999). For the purposes of this work, corporate governance is interpreted to be about promoting corporate fairness, openness, and transparency in regard to its responsibilities to stakeholders. In particular, this paper focuses on how corporate governance can help to promote corporate environmental responsibility through increased environmental disclosures using the Internet. Ideally, these disclosures should be timely, interactive, and more comprehensive than those being used within the traditional hard copy annual report or environmental, health and safety report. Unfortunately, this exploratory study revealed that this was not the case and that, in Australia at least, good corporate governance with respect to the environmental disclosures on the Web has a significant way to go.

The rise in prominence of a corporation's environmental reporting (e.g. triple bottom line reports; and environmental, health and safety reports) has been closely linked to the recognition that good corporate governance requires consideration of the impact a corporation has on the wider community and the environment. These reports are often released on an annual basis and are therefore retrospective and are often out-of-date, so it is important that companies use Internet based disclosures to ensure that stakeholders are fully informed of current environmental issues of significance.

The Internet is uniquely placed to enhance corporate transparency and therefore support the corporate governance objectives of an organization. The Internet has promised much. Not only has it provided the backdrop for some of the most extravagant corporate fantasies, it has also provided an arena for those interested in the role of technology in the formulation of a "new" society (Haywood, 1997). This has introduced significant debate about the ways that the Internet may impact on social organization and the life of its members (Steele, 1996). Within the context of this technological change, it has been argued that the Internet has emancipating potential because of its participatory and interactive appeal and there is evidence to suggest that the World Wide Web has provided the meeting ground for an increasingly global alternate political, cultural, and social movement (Crowther, 2000, and evidenced by activists in the "Battle of Seattle"; "virtual campaigns" targeting the activities of companies such as Shell in Nigeria and McDonalds in England). The Internet has enabled expanded access to a cheap publishing environment that has begun to challenge the old framework of legitimate and illegitimate ideas. Perhaps the most hopeful reading of emerging technologies is that they will have a significant impact on established power relationships within society, leading to more even distributions of social, political and economic power (Crowther, 2000).

Environmental Disclosures On The Web

> [R]elatively few companies used their Websites as a research and communication tool to proactively correspond with publics and even fewer used the medium as a tool to advance their positions on policy issues. (Esrock & Leichty, 1998, p. 315)

Although the last ten years have seen a massive increase in the volume of environment, health, and safety reporting, Australia has lagged behind the rest of the world. According to Maitland (2003), 100 of the FTSE 250 released information about the environmental, social, and ethical impacts of the company; 40 of the 50 largest European companies produce independent social and environmental reports; and although the United States lags behind these countries, 22 of the Standard and Poor's top 50

were reporting on social and environmental issues. Within this global context, Australia has been slow to take up the practice, with only 14% of the top 100 companies disclosing social and environmental information within the annual report or within a separate environment, health and safety report. In order to provide a greater context for the Australian focus of this research, it is valuable to consider the trends in Internet disclosure practices within other countries.

According to Esrock and Leichty (1998), a survey of Fortune 500 companies found that 90% have a Website and 82% have at least a single reference to social responsibility issues. However, they note that although Websites provide an opportunity for companies to build corporate image and consult with the public on matters of social responsibility, very few were using this to its capacity. Esrock and Leichty highlight the potentials of the Internet to enhance corporate transparency and engage directly with stakeholders, but their evidence suggested that social responsibility disclosures were largely top/down, without any meaningful two-way interactions with users. In other words, the dimensions of the Internet that differentiate it from other more standard mediums of information exchange (such as published reports; press releases; advertising) were not being utilized by companies to their full potential.

This is a view supported by Herbst (1998). According to Herbst, from the perspective of corporations, the Internet is becoming the primary source for environmental, health, and safety information and corporate environmental reporting. This has meant that in effect, "these organizations have harnessed Web technology to make corporate EHS [environment, health and safety] performance information readily available to the public" (p. 81). However, although Herbst's study revealed that usage had increased, the technology did not appear to change or enhance the way that the information was being presented.

In addition to the research conducted by Herbst, and Esrock and Leichty, Jones, Alabaster, and Walton (1998) and Jones, Alabaster, and Hetherington (1999) have conducted studies of corporate environmental information on the Web, wherein they suggested appropriate information and form (Jones et al., 1998) and then studied the existence of this information (Jones et al., 1999). Jones et al. (1999) investigated 275 companies across 21 sectors and 21 countries, finding that 59% of these companies provided some kind of environmental information on their corporate Website, the majority having directly translated or summarized the hard copy version of their corporate environmental report. These findings led Jones et al. (1999) to argue that corporations are not taking full advantage of the technology to make environmental information interactive and dynamic. Instead, they

found that companies were using the Internet to present information in an identical format and identical content to their hard copy material. This suggested that companies saw the Internet as a further point of distribution of this information, rather than a place in which information could be delivered differently and the content could be adapted to suit the medium (for example, the use of interactive resources; timely and up-to-date disclosures; audio and video delivery of information). This is consistent with the research by Esrock and Leichty (1998) and Herbst (1998) presented previously and the results are also consistent with the evidence presented in this work on Australian Web-based reporting practices.

Patten's 2002 study into the Web-based disclosure practices within the insurance sector reveals similar results. He claimed that, by and large, the sector had "failed to identify and encourage the value of the Internet as a stakeholder communications device" (p. 257). His research revealed that those companies that led the field in terms of on-line marketing of their products were not leaders in terms of information disclosure, particularly information pertaining to social and environmental issues to the same standard. The pattern identified in other research was repeated within this industry-bound context. Most notably Patten highlighted the lack of interactive Web-based features and the limited attention given to stakeholder engagement-something the technology is ideally suited to.

The Web may make it necessary for corporations to produce more environmental information because of the timeliness of the medium, the changing information expectations that are emerging as a result of the Internet, and the highly publicized importance of good corporate governance (Herbst, 1998). However, this does not necessarily mean that the disclosures will be of higher quality or motivated by an enlarged environmental conscience and it should be noted, "there may be little relationship between a corporation's self-presentation and its actual social performance" (Esrock & Leichty, 1998, p. 316). Further, Crowther (2000) has argued that corporate reports can be viewed as nothing more than image-creation mechanisms. As long as they are consumed as real by their recipients, then this consumption suffices to legitimate their existence and to disguise the absence of any relationship with corporate activity (p. 1845).

Although the link between social construction and corporate activity has been explored within the accounting literature well before the widespread use of the Internet (Hines, 1988), there is little doubt that the Internet has highlighted the "reality constructing" dimensions of corporate reporting (Jones et al., 1999). As such, the Internet may prove to be double-edged. On the one hand, it may provide a greater opportunity for corporations to colonize the meaning of the environment and to have an enlarged impact on

how the community views corporate environmental responsibilities and on the other, it may stimulate environmental information disclosure such that it can be effectively scrutinized and environmentally "sound" solutions can be developed. This paper outlines some initial findings on the use of the Internet to disclose corporate environmental information in Australia, but before discussing this, it is important to consider in more detail why the Internet may provide a unique location of such information and how it may differ from traditional text based disclosures.

The Purpose

Given the liberating and obfuscating possibilities of the Internet as a medium of information exchange, it is important to consider whether this has affected the ways that corporations disclose environmental information as part of their commitment to good corporate governance. Corporate environmental disclosures are being researched by accounting academics throughout the world (*Canada:* Zeghal & Ahmed, 1990; *Europe:* Adams, Hill, & Roberts, 1998; *Australia:* Deegan & Rankin, 1996; 1996a; 1999; *International*: Gamble, Hsu, Jackson, & Tollerson, 1996). This research is predominantly concerned with information trends provided within the corporate annual report relating to the environment (O'Donovan & Gibson, 2000). Research into environmental disclosures shows that information varies from qualitative statements and discussions within the text of the report-such as corporate governance statements (Kaidonis, 1999) and environmental policies (Tilt, 1994)-to quantitative information that is not of a financial nature-such as emissions per unit of production (O'Donovan & Gibson, 2000). Environmental disclosures also include financial information, such as the investment in environmentally sensitive technology (Niskala & Pretes, 1995).

As the printed annual report has been the traditional medium through which corporate information has been formally disclosed to the public, it has received a great deal of research attention (Niskala & Pretes, 1995; Fayers, 1998). However, as many corporations now have their own Websites that are easily accessible, this is a highly effective means of receiving and disseminating information (Ashbaugh, Johnstone, & Warfiled, 1999; Trites, 1999; Petravick & Gillett, 1998). These Websites are increasingly being used to provide up-to-date information about corporate practices, market position, future directions, and financial status; and, notably, it seems that they are being used to address community concerns about issues of corporate social and environmental responsibility (an example can be found on BP Amaco's Web-site) (Jones et al., 1998; 1999).

The Study

A revolution in corporate reporting is about to engulf users of financial statements. Companies are due, as a result of Internet technology, to report far more fully and frequently than ever before, stakeholders of all kinds will be informed and empowered and the old fashioned glossy corporate report is due for its long-awaited demise. (Gowthorpe & Flynn, 1997, p. 58)

Considering the importance of the Internet in a global business environment and also within social and environmental advocacy networks, any discipline concerned with corporate environmental accountability, accounting, disclosure, reporting, and corporate governance needs to understand how this electronic environment is impacting and changing the way that these processes are being actualized. Bearing in mind the liberating and obfuscating potential of the Internet,[1] the purpose of this study was to consider how the Internet may be affecting the environmental disclosure practices of a selection of publicly-listed Australian companies. Given that international research and industry-specific research has suggested the Internet is being under-utilized by companies for social and environmental responsibility reporting, this research was designed to explore this in an Australian setting. Although there is much debate about the contribution environmental disclosures can make to improve the natural environment of the planet (Andrew, 2000); Everett & Neu, 1999), this research was concerned with the role contemporary technologies may play in the dissemination of corporate environmental information and how corporations are using this new medium to circulate environmental information/discourse. There has been some research conducted in the accounting arena related to the affect the Internet will have on the provisions of traditional financial information (Petravick & Gillett, 1998; Koreto, 1997; Gowthorpe & Flynn, 1997; Brennan & Hourigan, 1998). Much of this literature has commented on the increasing timeliness of accounting information, the need to ensure that accounting information is cross platform so that it can be viewed in multiple environments, the ability to add video and audio to information, whether companies can cease to provide printed reports and reduce the cost of compulsory hard copy print runs,[2] what types of additional disclosures should be included,[3] what are the auditors' responsibilities, and how can a company ensure that the Website is not misleading to viewers through clear separation of audited financials and non-audited financials.

Currently the Web is an unregulated environment and "the decision on what to disclose via the company's homepage is entirely in the hands of management" (Gowthorpe & Flynn, 1997, p. 58). This means information can be selected, framed, and contextualized in a way that may expose or disguise those aspects of the company that suit management's objectives.

Although traditional accounting practices can also do the same thing, this is, perhaps, more blatant and more creative than most users are used to.

The Method

This study looked at the Websites of 64 randomly selected Australian companies listed on the Australian Stock Exchange. These companies were organized according to an industry category, including mining, forestry/packaging/paper, chemicals, engineering, transport/motors, energy (nuclear), energy (non-nuclear) and "other," which allowed for some exploration of pharmaceutical, agricultural, and biotechnology companies. These companies were drawn from the list of companies provided on-line by the Australian Stock Exchange (www.asx.com). At the onset, it was intended that the Web pages of 10 randomly chosen companies listed in each category would be examined, however on closer inspection some categories such as nuclear energy had far fewer companies operating within the industry (see Table 1). These are often referred to as environmentally contentious industries within the environmental accounting/disclosures literature and there have been suggestions of a correlation between these industries and environmental disclosures, so their inclusion was considered significant (*Environmental disclosures*, 1992; Deegan & Rankin, 1996; Deegan & Gordon, 1996;[4] O'Donovan & Gibson, 2000). As stated by Wilmshurst and Frost (2000) "environmental sensitivity of the industry has been argued to be influential on the level of environmental reporting" (p. 10; also argued by Deegan & Gordon, 1996). In regard to corporate reporting on the Web, Esrock and Leichty (1998) supported this view noting, "companies in the chemical, paper, oil and utility industries almost invariably give extensive avowals regarding their commitments to preserve the environment" (p. 316).

Although this correlation has yet to be supported unanimously, the failure to reach a consensus on many issues is evident within environmental accounting literature (Gray, Kouhy, & Lavers, 1995). According to Gray et al., "there is some evidence of industry effects but the studies are not clear or consistent enough to assess exactly what, if any, these effects may be" (p. 49).

However, these contradictions should not constrain exploratory research, but rather should be acknowledged and the limitations associated with research choices such as this can be explored and refined in future research efforts. Of course future studies could include other industry categories and other individual firms. However, these industries were selected because of their traditionally contentious relationship with the environment and the focus that such companies receive from environmental non-government

organizations and environmental advocacy groups (issues explore by Tilt, 1994; Bray, 1998, these are listed in Table 1).

Table 1

Number of companies studied in each industry category

Industry Category	Number of Companies Studied
Mining	10
Forestry/Packaging/Paper	10
Chemicals	5
Engineering	10
Transport/Motors	10
Energy (Nuclear)	1
Energy (Non-Nuclear)	8
Other[5]	10
Total	**64**

After categorizing industries, the information was then considered according to its type, including financial environmental information (for example, provision for clean-up costs, investment in green technologies), quantifiable environmental information (for example, emissions, waste management), and descriptive environmental information (for example, corporate environmental policy statements)-this is consistent with previous research, such as that by Harte and Owen (1991); Niskala and Pretes (1995); Gibson and Guthrie (1995); Gray et al. (1995); and O'Donovan and Gibson (2000).

Any study of this nature requires the researcher to make choices about how to approach and categorize the information and this study is no exception. As Deegan and Gordon (1996) suggested, research into environmental disclosures requires the researcher to develop some "arbitrary selection criteria" (p. 189), a view supported by Adams et al. (1998). The choices made within this work to categorize companies by industry, to use "environmentally contentious" industry groupings, and to distinguish the data type according to whether it is financial, quantifiable, or descriptive, are supported generally within the literature (Patten, 1992; *Environmental disclosures*, 1992; Niskala & Pretes, 1995; Deegan & Gordon, 1996; Wilmshurst & Frost, 2000).

Some examples include Harte and Owen's (1991) study of 30 companies considered to disclose significant amounts of environmental information. They focused on whether the company mentioned environmental matters; the extent of financial and non-financial information; and whether the information could be audited. Adams, Hill and Roberts' (1998) study of

environmental disclosures *across* countries in Western Europe led them to restrict their sample on the basis of access to data, choosing to focus on the largest 25 companies in six European nations with similar structural influences. They used the latest annual reports available to create a contemporary analysis and used content analysis, including quantitative and qualitative categories, to distinguish between the types of data provided (although there has been some criticism of the various methodologies used, see Gray, et al., 1995; Milne & Adler, 1999; Unerman, 2000). The United Nations' study (*Environmental disclosures,* 1992) of transnational corporations was based on a sample of six major global industries, including chemicals, forestry, metals, motors, petroleum, pharmaceuticals, soaps, and chemicals. These industries were chosen because they were considered to be in areas that were environmentally contentious, and therefore they were expected to disclose more information. The research used quite specific content criteria, including policies, improvements, emissions, government legislation, legal proceedings, financial impacts, and information in the notes to the accounts. The corporation KPMG (*Environmental reporting,* 1992) surveyed the top 100 countries in the United States, Canada, and the United Kingdom. They divided the data according to whether it was quantitative or qualitative. Ernst & Ernst's (1978) investigation of environmental disclosures was also based on financial information, quantitative information, and qualitative information.

For the purposes of this study, the data was collected over a six-month period between December 2001 and June 2002. As Websites change rapidly, the data is specific to this period and may not be the same at the time of publication. In fact, many of the sites analyzed had changed even within the study period and, in an attempt to collect consistent results, information from the Websites was taken only from the first viewing. Although many sites were viewed more than once in order to clarify some issues that arose from the data, no additional information was added to the database. As the research is an initial investigation into environmental disclosures on the Web the first consideration was to see whether environmental information featured on the Website, how it was featured, and the ease to which this information could be accessed. After this was established, the substance of the disclosures was also considered. In order to collect and record the information, a database was designed along the lines of Deegan and Rankin's (1999) work on environmental disclosures, but as the research was not purely focused on quantification, additional information was collected relating to Website disclosures. In the following section the results of this investigation will be discussed.

Results

> [D]espite the effort to use the Web as an image building medium, few corporations highlight these efforts by placing a social responsibility hotlink on the homepage. (Esrock & Leichty, 1998, p. 315)

As outlined above, the first point of consideration was whether the companies had a section on their Websites that was dedicated to the environment. To qualify for this, the company had to have a section that was specifically labeled with the word "environment" (which included environmental, health and safety sections) and the section's contents needed to discuss, in some way, the corporation's interactions with the physical world. As outlined in Table 2, the results were surprisingly low. Of the 64 companies examined, 77% did not have a dedicated environment section and 23% did. The one nuclear company examined, Energy Resources Australia, had a section dedicated to the environment, which was not unexpected considering the amount of scrutiny the company has been under in regarding to its Jabiluka mining operations (a situation documented by Birkland (1988) in relation to the Exxon Valdez oil spill). Four out of five of the chemical companies under analysis had a section dedicated to the environment. Although the conclusions that can be drawn from this are limited by the lack of companies in this category with a Website, this is a significant proportion. Of the non-nuclear energy companies under analysis, 38% had a dedicated environment section on their Website. Overall, very few companies seemed to consider environmental issues significant enough to dedicate a section to them. As will be shown in further results, this did not mean that the companies did not offer any environmental information, but that this information was dispersed throughout other sections of the Website. This is a view supported by Herbst (1998), who studied benchmark companies such as British Telecommunications, Royal Dutch Shell, Intel, and IMB and discovered that this environmental information was dispersed throughout the Website.

Table 2

Number of Web pages with an environment section

Industry Category	Number of Companies	Environment Section			
		No	Yes	No%	Yes%
Mining	10	9	1	90	10
Forestry/Packaging/Paper	10	8	2	80	20
Chemicals	5	1	4	20	80
Engineering	10	9	1	90	10
Transport/Motors	10	9	1	90	10

Industry Category	Number of Companies				
Energy (Nuclear)	1		1		100
Energy (Non Nuclear)	8	5	3	62	38
Other[5]	10	8	2	80	20
Totals	**64**	**49**	**15**	**77**	**23**

In an attempt to establish a more detailed understanding of the corporations' use of their Websites for environmental disclosures, data was collected on the number of corporations that have the word "environment" on their homepage (see Table 3). Although many other words may be used to refer to a corporation's interactions with the physical world, such as "natural resources" or "green issues," the word "environment" was chosen because it seems to have entered corporate discourse as the most common way to refer to the natural environment (evidenced by such things Environmental, Health and Safety Reports; Corporate Environmental Reports, and the increasing tendency to have an Environment Manager).[6] The "find (on this page)" function was used to ensure that the word would be picked up, irrespective of the size of the homepage. Again, only 27% of homepages referred to the environment, which was slightly higher than the previous search for an independent environment section, but was still lower than expectations. Significantly, the word "environment" appeared on 4 of 10 of the homepages analyzed in the forestry/packaging/paper industry and four of five chemical companies surveyed also referred to the environment on the homepage. Within the other industry groups it seems that this is not within the norm. In future, a larger sample of companies may help to determine whether this represents a general trend across all publicly listed companies within these industry groups and whether this increases as corporations begin to occupy more sophisticated on-line Websites. This is consistent with the findings of Esrock and Leichty (1998).

Table 3

Number of homepages in which the word "environment" appeared

Industry Category	Number of Companies	Environment Section			
		No	Yes	No%	Yes%
Mining	10	9	1	90	10
Forestry/Packaging/Paper	10	6	4	60	40
Chemicals	5	1	4	20	80
Engineering	10	9	1	90	10
Transport/Motors	10	9	1	90	10
Energy (Nuclear)	1		1		100
Energy (Non Nuclear)	8	5	3	62	38
Other[5]	10	8	2	80	20

		64	47	17	73	27
Totals						

At the outset it was assumed that the existence of a search engine would help locate environmental information, however on closer inspection very few companies had search engines, in fact only 9 out of 64 did, and it was discovered that many of these were inefficient, slow, and produced confusing results relating to many other "environments" beyond those under analysis (see Table 4). Generally the search functions were not useful, and it was only when the sites were explored in more detail that it was possible to come across environmental information. This would suggest that the companies we investigated were not using the medium to its full capacity and the interactive elements were not being utilized to support users. Herbst (1998) claimed that all the benchmark companies studied operated fast and efficient search engines, something not apparent in the results of this sample of Australian companies.

Table 4

Search for environmental information on Websites

Industry Category	Number of Websites with a Search Engine	Was the Search for Environmental Information Easy?			
		No	Yes	No%	Yes%
Mining	2	2		100	
Forestry/Packaging/Paper	1	1		100	
Chemicals	1	1		100	
Transport/Motors	1	1		100	
Energy (Non Nuclear)	4	2	2	50	50
Totals	9	7	2	78	22

After establishing that searches for environmental information were difficult, as there were very few sites making use of a search engines, each page on each site was visited and the "find on this page" tool was used to locate any environmental content. All embedded files were viewed and searched. Although few companies used video/audio information, the content of these were viewed but were not included in Table 5. This data shows the number of times the environment was referred to in different locations, and more specifically, the issues to which they referred. These were totaled according to the number of references across all industry categories, and then broken down into particular industries (see Table 5). Of the 64 companies studied, there were 511 environmental disclosures, some of these reflect a simple sentence and some involved more information. For the purposes of this

research the substance of the disclosure was considered to be more important than the size. References to the EPA or other environmental organizations proved to occur the most across all industries (64 times), and references to "ethical investment" and "environmental protection" proved to occur the least (one time for each).

Table 5

Content of Disclosure

Category of Disclosure	All Industries	Chemicals	Energy (non-nuclear)	Energy (nuclear)	Engineering	Forestry/ Packaging /Paper	Mining	Transport/ Motors	Other
Chair's report	4					2	1	1	
Comment on ethical investment	1								1
Comment on sustainability	17	4	1	1	1	7		1	2
Corporate governance	12	1	1		2	2	1	1	4
Director's report	15	1	4		4	2	2	1	1
Emissions	39	9	12	1	6	3	3	5	
Energy conservation	13	5	1		4	1		2	1
Environmental audit - External	9			5	1		1	1	1
Environmental audit - Internal	13	3		1	3	2	3		1
Environm	14	4	1	3	3	2	1		

ental committee									
Environmental performance	53	7	6	2	12	13	8	3	2
Environmental policy	38	5	4	3	6	10	2	1	7
Environmental project or program	51	8	13	4	4	8	4	3	7
Environmental protection	1	1							
Environmental targets	25	5	5	2	4	5		3	1
Interactions with EPA or other environmental organization	64	13	11	2	10	12	7	5	
Member of industry environmental group	9	2	1		2	2			2
Packaging strategies	4	2				1		1	2
Pollution abatement	22	6	3		5	2	1	3	2
Receipt environm	9	2			3	1		21	

ental award								
Recycling	12	3				6		3	
Reports of specific environmental events	31	6	4	3	7	6	1	1	3
Subscription to voluntary industry environmental standard	8	4	1			2		1	
Totals	511	101	80	31	80	92	41	41	45

These disclosures were then categorized according to type. According to our categorizations (outlined in "The Method" section above), of the 511 disclosures only 6% were financial, 15% were quantitative non-financial, and a massive 79% were qualitative (see Table 6). This reflects the trend in the environmental disclosure literature more broadly, suggesting that the Internet has not led to any substantial changes in the type of environmental disclosures favored by corporations.

Table 6

Types of environmental information

Industry Category	Total	Financial	**Qualitative**	Quantitative Non-Financial
Mining	41	2 : 5%	35 : 85%	4 : 10%
Forestry/Packaging/Paper	92	2 : 2%	86 : 93%	4 : 4%
Chemicals	101	5 : 5%	72 : 71%	24 : 24%
Engineering	80	7 : 9%	57 : 71%	16 : 20%
Transport/Motors	41	2 : 5%	28 : 68%	11 : 27%
Energy (Nuclear)	31	4 : 13%	24 : 77%	3 : 10%
Energy (Non Nuclear)	80	5 : 6%	66 : 83%	9 : 11%
Other[5]	45	3 : 7%	36 : 84%	4 : 9%
Totals	**511**	**30 : 6%**	**406 : 79%**	**75 : 15%**

The location of disclosures was also considered. This was divided into three categories, the environment section for those companies with this, the financial section, and what we called "integrated," in that the disclosures featured throughout the Website. The area that seemed to feature the most environmental information was the financial section, although, as stated previously, very little of this was of a financial nature. The area that ranked a close second was the environment section, a result that needs little interpretation. Comment on the environment was considered to be relevant to the general Website for 23% of the 511 disclosures outlined earlier (see Table 7).

Table 7

Location Of Disclosure

Industry Category	Total	Environment section	Financial Section	Integrated
Mining	41	13 : 32%	22 : 54%	6 : 15%
Forestry/Packaging/Paper	92	19 : 21%	45 : 49%	28 : 30%
Chemicals	101	50 : 50%	36 : 35%	15 : 15%
Engineering	80	40 : 50%	37 : 46%	3 : 4%
Transport/Motors	41	26 : 68%	5 : 12%	8 : 20%
Energy (Nuclear)	31	21: 68%	2 : 6%	8 : 26%
Energy (Non Nuclear)	80	14 : 18%	26 : 32%	40 : 50%
Other[5]	45	5 : 11%	30 : 67%	10 : 22%
Totals	**511**	**190 : 37%**	**203 : 40%**	**118 : 23%**

One of the benefits of an Internet site over a text-based information exchange is the ability to make the site interactive and to allow the user to determine their information needs. In order to facilitate this, Jones et al. (1999) suggested that corporations should be linking their Website to outside sources of information. To test this we considered whether the page had links to outside environmental Webpages (such as Environment Australia). We did not expect to find corporations linking to environmental groups such as the Australian Conservation Foundation, but we looked for this as well. Surprisingly, corporations were not using this feature, with only 9 of the 64 companies studied having links to other environmental Webpages (see Table 8).

Table 8

Links to Other Environmental Web Pages

Industry Category	Total	Has Links	Does not have Links
Mining	10		10 : 100%

Forestry/Packaging/Paper	10	1 : 10%	9 : 90%
Chemicals	4	2 : 50%	2 : 50%
Engineering	10		10 : 100%
Transport/Motors	10		10 : 100%
Energy (Nuclear)	1	1 : 100%	
Energy (Non Nuclear)	8	5 : 63%	3 : 37%
Other[5]	10		10 : 100%
Totals	**63**	**9 : 14%**	**54 : 86%**

One of the more significant findings of this research was the limited ways in which corporations are using the interactive features of Web technology. This research revealed that the use of audio and video delivery of information on-line was very limited, and those that did use it, often provided nothing that was specifically designed for their Website. For example, two transport companies utilized the video capabilities to show their latest advertisement; companies in the forestry/packaging/paper category showed video images of the annual general meeting, and another company presented financial information on its growth in an audio-visual format. Very little of this information was tailored to the Internet. Most notably, the information presented was often too long (one company provided a two-hour Web cast of its annual general meeting) and it often took too long to download. Although the information provided in Table 9 suggests that companies are utilizing the video capabilities of the Internet, this research revealed that the video clips were poorly designed, did not add any new information, and were not used to capacity-a result that is consistent with the findings of Esrock and Leichty (1998), Herbst (1998), and Patten (2002).

Table 9

Use of Audio and Video Features

Industry Category	Total	Number With Audio	Number With Video
Mining	10	0	0
Forestry/Packaging/Paper	10	1	4
Chemicals	4	1	0
Engineering	10	0	2
Transport/Motors	10	1	5
Energy (Nuclear)	1	0	0
Energy (Non Nuclear)	8	0	3
Other[5]	10	0	3
Totals	**63**	**3 : 5%**	**17 : 26%**

Conclusions and Directions for Future Research

Corporate disclosures on the Internet have the potential to contribute significantly to good corporate governance. With regard to the environment, corporations have the ability to provide timely and interactive information about the company's objectives and how they are meeting these. However, these initial findings indicate that as yet, Australian corporations are not using the Internet to its full advantage. This evidence indicates that Australia is following the pattern identified in larger economies, such as the United States. It is apparent that the companies studied are using the Internet similarly to text-based environmental disclosures, evidenced by the limited use of the Internet's interactive features such as search engines, Web links, audio, and video. The Internet provides corporations with an opportunity to increase their environmental disclosures and enhance transparency around their corporate practices through many of the interactive features of the Web. However, at this stage the corporations we studied were doing little to enhance disclosures, mimicking the relatively well-known territory of printed disclosures that are generally qualitative and often ambiguous. There is much work that can be done in this area, as the Internet provides an opportunity to transcend the traditional limitations of time and distance that have plagued traditional modes of corporate disclosure. This research indicates that Australian companies were not utilizing the Internet to its potential and the possible benefits of corporate governance were not being optimized through the use of Web-based environmental disclosures. In light of other work that has been conducted in the area, it is a little surprising to have not seen advances in the area.

There is enormous scope for research into environmental disclosures on the Web because of the nature of the medium and the perception that it has opened access to information that was difficult to acquire previously. The combination of corporate and community interest in the medium requires more analysis to determine what role environmental disclosures are playing in debates over the environment. However at this stage, it appears that Australian publicly-listed companies are not using the Internet to disclose their environmental impacts, approaches, practices, or policies differently than traditional text-based medium, and the contribution this plays to the achievement of good corporate governance is limited.

There are still many issues to be considered. In the future, it would be interesting to look at whether environmental information on the Web is being used by different groups than those who use printed annual reports.[7] These companies could be investigated over time to see if they have changed, the sample size could be enlarged, or the location could be changed. A detailed analysis of those corporations that have led the field in terms of their text-based reports could be conducted to see if they are doing

the same on their Websites and whether they outstrip others in their use of the technology.

References

Adams, C., Hill, W., & Roberts, C. (1998). Corporate social reporting practices in western Europe: Legitimating corporate behaviour. *British Accounting Review, 30,* 1-21.

Andrew, J. (2000). The accounting craft and the environmental crisis: Reconsidering environmental ethics. *Accounting Forum, 24*(2), 197-222.

Ashbaugh, H. Johnstone, K. M. and Warfield, T.D. (1999). Corporate reporting on the Internet. *Accounting Horizons, 13*(2), 241-257.

Birkland, T. A. (1998). In the wake of the Exxon Valdez: How environmental disasters influence policy. *Environment, 40*(2), 4-12.

Bradley, M., Schipani, C., Sundaram, A., & Walsh, J. (1999). The purposes and accountability of the corporation in contemporary society: Corporate governance at a crossroads. *Law and Contemporary Problems, 62*(3), 9-87.

Bray, J. (1998, winter). Web wars: NGOs, companies and governments in an Internet-connected world. *Greener Management International,* (24), 115-132.

Brennan, N., & Hourigan, D. (1998). Corporate reporting on the Internet by Irish companies. *Accountancy Ireland, 30*(6), 18-21.

Bower, C. A., (2000). *Let them eat data: How computers affect education cultural diversity and the prospects of ecological sustainability.* London: The University of Georgia Press.

Coombs, W. T. (1998). The Internet as potential equalizer: New leverage for confronting social irresponsibility. *Public Relations Review, 24*(3), 289-303.

Crowther, D. (2000). Corporate reporting, stakeholders and the Internet: Mapping the new corporate landscape. *Urban Studies, 37*(10), 1837-1848.

Dawson, M., & Foster, B. (1996). Virtual capitalism: The political economy of the information highway. *Monthly Review, 48*(3), 40-59.

Deegan, C., & Gordon, B. (1996). A study of the environmental disclosure practices of Australian corporations. *Accounting and Business Research, 26*(3), 187-199.

Deegan, C., & Rankin, M. (1996). Do Australian companies report environmental news objectively? *Accounting, Auditing and Accountability Journal, 9*(2), 50-67.

Deegan, C., & Rankin, M. (1996a). The materiality of environmental information to users of annual reports. *Accounting, Auditing and Accountability Journal, 10*(4), 562-583.

Deegan, C. & Rankin, M. (1999). The environmental reporting expectations gap: Australian evidence. *British Accounting Review, 31,* 313-346.

Environmental disclosures: International survey of corporate reporting practices. (1992). New Jersey: United Nations.

Environmental reporting: A survey of the top 100 companies in the US, UK and Canada. (1992). London: KPMG Peat Marwick.

Ernst & Ernst. (1978). *Social responsibility disclosure: 1978 survey.* Cleveland, OH: Ernst & Ernst Press

Esrock, S. L., & Leichty, G. B. (1998). Social responsibility and corporate Web pages: Self-presentation or agenda setting. *Public Relations Review, 24*(3), 305-319.

Everett, J., & Neu, D. (1999). *Ecological modernization and the limits of environmental accounting?* Paper presented at the Critical Perspectives on Accounting Conference, New York.

Fayers, C. (1998). Environmental reporting and changing corporate environmental performance. *Accounting Forum, 22*(1), 74-94.

Gamble, G., Hsu, K., Jackson, C., & Tollerson, C. (1996). Environmental disclosures in annual reports: An international perspective. *The International Journal of Accounting, 31*(3), 293-331.

Gibson, R., & Guthrie, J. (1995). Recent environmental disclosures in annual reports of Australian private and public sector organizations. *Accounting Forum, 19* (2/3), 111-127.

Gowthorpe, C., & Flynn, G. (1997). Reporting on the Web: The state of the art. *Accountancy, 120*(1248), 58-59.

Gray, R., Kouhy, R., & Lavers, S. (1995). Corporate social and environmental reporting: A review of the literature and longitudinal study of UK disclosure. *Accounting, Auditing and Accountability Journal, 8*(2), 47-77.

Harte, G., & Owen, D. (1991). Environmental disclosures in the annual reports of British companies: A research note. *Accounting, Auditing and Accountability Journal, 4*(3), 51-61.

Haywood, T. (1995). *Info-rich info-poor: Access and exchange in the global information society.* London: Bowker Saur.

Haywood, T. (1997). Praise the Net and pass the modem: Revolutionaries and captives in the information society. *Library Review, 46*(7), 472-489.

Herbst, T. (1998). Environmental disclosure: Corporate use of the World Wide Web. *Corporate Environmental Strategy, 5*(2), 81-90.

Hines, R. (1988). Financial accounting: In communicating reality, we construct reality. *Accounting, Organizations and Society, 13*(3), 251-261.

Inayatullah, S. (1998). Deconstructing the information era. *Futures, 30*(2/3), 235-247.

Jones, K., Alabaster, T., & Walton, J. (1998, Spring). Virtual environments for environmental reporting. *Greener Management International,* (21), 121-135.

Jones, K., Alabaster, T., & Hetherington, K. (1999, Summer). Internet-based environmental reporting. *Greener Management International,* (26), 69-90.

Kaidonis, M. A. (1999). Social reporting. In C.T. Heazlewood & J.B. Ryan, *Australian company financial reporting.* Caulfield, Victoria, Australia: Australian Accounting Research Foundation.

Koreto, R. J. (1997). When the bottom line is online. *Journal of Accountancy, 183*(3), 63-65.

Maitland, A. (2003, Sept 29). No hiding place for the irresponsible business: Companies are trying to pre-empt trouble over social, environmental and ethical issues. *Financial Times,* 2.

Milne, M. J., & Adler, R. W. (1999). Exploring the reliability of social and environmental disclosures content analysis. *Accounting, Auditing and Accountability Journal, 12*(2), 237-256.

Niskala, M. and Pretes, M. (1995). Environmental reporting in Finland: A note on the use of annual reports. *Accounting, Organizations and Society, 20*(6), 457-466.

O'Donovan, G., & Gibson, K. (2000). *Environmental disclosures in the corporate annual report: A longitudinal Australian study.* Conference paper, 6th Interdisciplinary Environmental Conference, Montreal, Canada.

Patten, D. M. (2002). Give or take on the Internet: An examination of the disclosure practices of insurance firm Web innovators. *Journal of Business Ethics, 36,* 247-259.

Petravick, S., & Gillett, J. W. (1998). Distributing earnings reports on the Internet. *Management Accounting, 80*(4), 54-56.

Shleifer, A., & Vishney, R. (1997). A survey of corporate governance. *The Journal of Finance, 52,* 737-783.

Steele, L. W. (1996). And the walls came tumbling down. *Technology in Society, 18*(3), 261-284.

Tilt, C. A. (1994). The influence of external pressure groups on corporate social disclosure: Some empirical evidence. *Accounting, Auditing and Accountability Journal, 7*(4), 47-72.

Trites, G. (1999). Democratizing disclosure. *CA Magazine, 132*(8), 47-48.

Robins, K., & Webster, K., (1999). *Times of the technoculture.* London: Routledge.

Unerman, J. (2000). Methodological Issues: Reflections on quantification in corporate social reporting content analysis. *Accounting, Auditing and Accountability Journal, 13*(5), 667-681.

Wilmshurst, T. D. and Frost, G. R. (2000). Corporate environmental reporting: A test of legitimacy theory. *Accounting, Auditing and Accountability Journal, 13*(1), 10-26.

Zeghal, D., & Ahmed, S. A. (1990). Comparison of social responsibility information disclosure media used by Canadian firms. *Accounting, Auditing and Accountability Journal, 1,* 38-53.

Notes

[1] This posits that the Internet can be liberating as it has the potential to provide timely, interactive, and accessible information about a corporation's environmental position. However, it can also be obfuscating, in that the corporation can elect to highlight and prioritize certain information and thereby influence the way stakeholders perceive a corporation's environmental responsibilities and the ways that they manage these responsibilities.

[2] Currently, companies can only offer the choice.

[3] Such as, how often should the financial information be updated, what outside information should the company link to etc.

[4] Deegan and Gordon (1996) listed industry groupings in the following order of sensitivity based on the Membership Weighted Industry Environmental Sensitivity Index: Uranium, Chemicals, Coal, Transport, Oil/Gas Explorers, Plastics Manufacturing, Oil/Gas Producers, Gas Distributors, Paper Merchants, and Timber Products.

[5] This category includes cement, pharmaceuticals, biotechnology, glass, agriculture, conservation, and manufacturing companies.

[6] The limitations of such a choice are acknowledged and future research may focus on broader terminology in order to get a wider view of environmental information on corporate Websites.

[7] For example, are activists seeking out such information to guide future environmental action?

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