# The World Wide Web and environmental reporting: A longitudinal study into companies in the Australian minerals industry

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**Abstract**

This study monitors environmental disclosure on the corporate websites of three companies in the Australian minerals industry. These websites were analyzed on a daily basis for an entire year, a process referred to as longitudinal web analysis in this paper. Most studies on web based environmental reporting are cross sectional, presenting snapshots of web disclosure only at one point in time. Given the dynamic nature of websites, information analyzed at a particular point could change easily within a certain period of time. Thus, a need arises for a continuous monitoring of websites over a period of time. Details on the longitudinal website analysis of the three companies are presented in this paper and implications for future environmental reporting research are identified.

## Introduction

Environmental issues associated with corporate activity have risen to prominence recently; evident from the increase in environmental disclosure by companies since the 1990s (Deegan, 2002). The medium used for disclosing environmental issues to stakeholders includes conventional print media reports such as annual reports and stand alone environmental/sustainability reports (see for example, Gray and Bebbington, 2001), as well as electronic mechanisms such as the web (see for example, UNEP, 1999,2001, ACCA, 2001).

The web provides many benefits to companies for disclosing environmental information (see Lodhia, 2004). Environmental information can be disclosed on timely basis to stakeholders. Such information is accessible to a range of stakeholders, due to the mass communication and global reach benefits of the web. The presentation and organization of environmental information can also be enhanced through the use of the web medium. Moreover, the web enables interactivity, leading to the opportunity for stakeholders to engage with companies in relation to environmental issues.

The focus of this paper is on the timeliness benefit of the web. Given that the web provides the ability to disseminate information on a timely basis, existing content analysis methods used for examining environmental disclosure in conventional print media reports are unlikely to provide an in-depth understanding of the web based environmental reporting practice. This is because information examined on a cross sectional basis on the web has the potential to be updated immediately. A need arises for an in-depth study which provides a longitudinal account of environmental disclosure on corporate websites.

This paper advocates a possible approach towards capturing environmental disclosure on websites through a longitudinal study into the web based environmental reporting practices of three companies in the Australian minerals industry. Selection of companies in the minerals industry was based on the premise that their highly visible environmental impacts and constant stakeholder pressure (IIED, 2002) require an increasing need for environmental reporting on regular basis (Peck and Sinding, 2003). Consequently, these companies could utilize their websites on a timely basis for disclosing environmental information to their stakeholders. Prior to providing further details on the current study, this paper proceeds with an overview of the existing literature on web based environmental reporting.

**Prior Literature**

The bulk of literature on web based environmental reporting has focused on environmental disclosure on corporate websites. However, there have been a few studies that have also interviewed corporate executives on the use of the web for environmental reporting.

Early literature on web based environmental reporting such as Craven and Otsmani (1999), UNEP (1999) and Williams and Pei (2000) have indicated that web based environmental reporting was dominated by larger companies in the developed world. More recent literature has examined the environmental disclosure of such companies. These include UNEP (2001), Rikhardsson et al (2002), Patten and Crampton (2003) and Andrew (2003). A common theme in these studies is that while companies are disclosing environmental information on their websites, they are not utilising the web extensively for environmental disclosure. It appears that a lot of companies are not effectively applying the benefits of the web for environmental

reporting purposes. This is also evident in the work of Jones et al (1999) and Adams and Frost (2004) who sought the views of corporate executives in addition to examining environmental disclosure on websites.

Unerman and Bennet (2004) have expanded the web based environmental reporting literature by focusing on the interactivity feature of the web. They examined the debate on Shell's discussion forum in relation to social and environmental issues. The authors highlight that the web does enable stakeholders to undertake democratic dialogue with companies, albeit electronically. This suggests that in addition to environmental reporting, the web also enables stakeholder engagement.

An analysis of the literature on web based environmental reporting presented here indicates that most prior literature is general. Apart from Unerman and Bennett (2004), most prior literature has provided aggregated results of companies in particular countries. Whilst such studies are useful, they do not provide an in-depth understanding of the different contexts in which the web is utilised by companies for environmental reporting. For instance, a study into the practices of the leading companies in a particular industry can provide valuable insights into the potential contexts in which the web is an appropriate medium for environmental reporting.

It is also evident from the literature that most prior literature on web based environmental reporting is cross sectional. Unerman and Bennett (2004) and Adams and Frost (2004) are the exceptions. The former looked at stakeholder dialogue rather than environmental reporting through an in-depth analysis of the debate on a discussion forum over an entire year. Moreover, Adams and Frost (2004) looked at websites over a period of time on a quarterly basis and found limited use of the potential of the web by companies in three different countries (UK, Germany and Australia). Both these studies have extended the literature by transcending beyond

snapshots of current practice to provide a valuable dataset on environmental communication through websites.

## The current study

### *Overview*

This study seeks to address some of the gaps in the existing literature on web based environmental reporting identified in the previous section. Focus was on a specific context rather than on providing general aggregated findings. The web based environmental disclosure of three companies in the Australian minerals industry was studied over a longitudinal period in order to capture the extent to which environmental information changes on websites.

The case study approach (Yin, 2003) was the most viable research strategy for this research. This is because emphasis in this study was on gaining an in-depth understanding in a particular context. The study did not attempt to gain statistical generalizations but rather sought analytical insights into the practice of web based environmental reporting in a particular environmentally sensitive industry. Thus, the research focused on three companies rather than all the companies in the minerals industry with an aim to establishing analytical generalisations which could inform future research in this area.

In order to select specific companies for the cases, the websites of all companies in the Australian minerals industry were examined over a period of time. Three specific companies were selected because they had extensive environmental information disclosed on their websites. These companies are referred to as A, B and C in order to protect their identity and their details are provided in Table 1.

| Company | Details |
|---|---|
| A | • A local company that has been the leader in environmental reporting in Australia.<br>• Has its own website and its headquarters is based in Australia. |
| B | • A former local Australian company which was recently taken over by a US corporation. While it is regarded as a local branch of this company, it still retains its Australian management and a lot of its environmental communication processes have remained the same.<br>• Has its own Australian website, which is also linked to its parent company's global website. |
| C | • A former Australian multinational, which merged with a foreign multinational recently. It has its headquarters in Australia.<br>• Has a global website with an extensive Australian representation on this. |

**Table 1: An overview of companies used for the case studies**

*Methods*

A longitudinal study was undertaken in this paper in order to obtain a comprehensive understanding of existing practices. Longitudinal studies for web based environmental reporting encompass analysis of websites over a period of time and this is taken to be a year for this study. Whilst the time period for longitudinal web based environmental reporting studies differ from the multiple years studies for conventional print media, both forms of analysis serve to provide an understanding of trends in communication over a period of time whereby extensive changes take place. The dynamic nature of corporate websites indicates that information changes on websites in one year can be quite extensive, providing scope for a detailed analysis.

The longitudinal website analysis undertaken in this study represents the development of a new approach to studying web based environmental reporting. This extends beyond the cross sectional website analysis undertaken in prior literature and requires a continuous examination of web based environmental reporting.

Adams and Frost (2004) undertook web based environmental disclosure monitoring on a three monthly basis and found useful insights into current practices. This study adds to this existing literature by focusing on the daily examination of corporate websites in order to capture the intricacies of web based environmental reporting.

On December 31st, 2003, the overall contents of each company's website in relation to environmental information was recorded. This involved recording the structure of each website, clearly highlighting every hyperlink and menu on the website. The entire environmental content of this website was printed and maintained in a log file. This provided a basis for examining any subsequent changes made to the information content or structure of the website (including changes in the form in which environmental information is presented).

The websites of these companies were monitored on a daily basis in order to comprehend the contemporary communication of environmental information. Any changes during the year were observed and entries were recorded in this file. The actual contents displayed on these websites were printed and stored in the log file. All information gathered during the one year period was analysed on an ongoing basis.

A software package called the change detection software (**http://Web.changedetection.com/monitor.html**) was used to monitor any changes occurring in the environmentally related information on the websites. This software has the ability to detect changes on websites and send an email to the person requesting the monitoring whenever a change has occurred on a website. The researcher tested this software initially on the website of the School of Business and

Information Management[1] at the Australian National University, a website where information is updated on a regular basis. Every change made to this website was picked up by this software. Nevertheless, the researcher randomly visited the website of each of the three companies on a weekly basis during the year of analysis in order to cross check the reliability of the software package.

*Findings*

The longitudinal website analysis findings are presented in several stages, with the initial and restructure stages providing a basis for ascertaining the changes made on the websites over the year. A postscript stage reports any significant issues related to the web based environmental reporting practice of the companies after the longitudinal website analysis ceased.

The initial structure

All three companies had extensive environmental information on their websites. They also seemed to be utilising the benefits of the web extensively for environmental reporting.

All companies had sustainability/social responsibility sections, suggesting that environmental information is now being integrated with other social information. However, environmental information was dominant on all the websites. Current and past social and environmental reports were provided for overall as well as individual operations. Both company A and C produced summary social and environmental reports in hardcopy, and had the detailed information presented as web portals on

[1] Now split into two schools, with the researcher being a member of School of Accounting and Business Information Systems.

their corporate website. There was also a range of information on environmental policies, performance and initiatives by all three companies. Moreover, company C provided details on a major environmental incident, even though many years have elapsed since the occurrence of this incident.

A lot of emphasis was placed on presenting and organising environmental information and making this accessible to stakeholders. Hyperlinks and menus were used to organize and integrate environmental information while graphical features enhanced the presentation of information. Animated and multimedia features were kept to be bare minimum and it seems that this was in order to improve accessibility of information. Information was timely but continuous reporting was not evident from these websites, given that a lot of the environmental information on websites appeared to be between one to three months old. Interactive capabilities of the web included email contacts for social and environmental issues on the website as well as feedback forms for the companies' reports. Company A even had a subscription to an email alert for sustainability issues specifically while the other companies had email alerts for general corporate issues.

At the outset, it appeared that all the companies were extensively using the Web for environmental reporting, justifying their selection as cases for this study. However, continuous reporting was not evident, while mechanisms such as discussion forums were not available on these websites.

Restructure of websites

Companies A and B had major changes to their websites in March, 2004. Company A decided to adopt a continuous environmental reporting strategy through use of the web. On the other hand, Company B reorganised its website in order to align it with the parent company's webpage.

Company A presented its 2003 sustainability report as a web portal instead of a downloadable report. A range of environmental information appeared on the web portal. The website had an overview section, a specific section on environment, health and safety, section on other aspects of sustainability, and a section with information on the company's environmental performance. There was also "noticeboard" section which is used to inform stakeholders of any new sustainability information that was added to the website. The intention was to continue updating information on this website on a real time basis. A feedback section existed which provides a feedback form that stakeholders can access. This could be used by stakeholders to contact the company in relation to sustainability issues.

The presentation and organization of the website, and its accessibility were similar to its previous version. Timeliness was enhanced due to a move towards continuous reporting. However, interactive elements were not were enhanced through mechanisms such as discussion forums. Moreover, email alerts were no longer available, probably due to the fact that the company now provided "live data" on its website.

Company B had a significant reduction in information content on its website in March. A lot of the social and environmental information appeared on the global website, representing the entire operations of the company. This included issues such as environmental policies and standards, audit and assessment, general environmental performance information, and past reports and other key documents. There were some references to these in the local website through hyperlinks to the global website.

The website features for Company B remained the same. Emphasis was on presentation, organization and accessibility of information. Timeliness of information was not too clear while the interactive capabilities had been reduced.

To sum up, two of the companies had extensive changes to their website structure. One of them was looking at enhancing its web based environmental reporting practice while the other had to reduce its information content and align it with its global company. These findings provided a basis for understanding subsequent changes to these websites.

Changes to websites in 2003

As table 2 indicates, company A's adoption of a continuous reporting strategy from March led to extensive changes on its website. Environmental information dominated the social and environmental disclosure. Periodic information and updates, and reorganization of some sections of the website took place initially. The company provided its environmental, heath and safety non-compliance data for each quarter during the year.

| Website change | No of instances |
|---|---|
| General environmental information | **6** |
| Environmental performance information | **3** |
| Environmental initiatives | **5** |
| Environmental incidents | **7** |
| **Social information** | **3** |

**Table 2: Changes on company A's website**

Positive news items included reporting of initiatives such as global reporting challenge and greenhouse challenge, the company's ranking in the Dow Jones sustainability index and other smaller environmental initiatives that the company was

involved in. There was also negative information disclosed with information environmental incidents being provided on a regular basis throughout the year

Disclosure was timely for most issues and appeared to be accessible to anyone with Web access. Hyperlinks were used extensively to organize environmental information. Certain disclosures led to change in other sections of the website, with either a new section being created or new information being added to existing sections. Limited presentation and interactive features existed.

Towards the end of the year, there was limited disclosure on the website. There is anecdotal evidence to suggest that this could be related to the company being subject to a hostile takeover bid.

Company B's website remained manly stagnant after its site restructure in March. A major change incurred in May when the company released its social and environmental reports. Reports on the Australian operations were available for download. Towards the end of the year, the company did provide information on the social and environmental presentations made by corporate executives in Australia. It seems that the company had a lot of restrictions on its information dissemination through its website, and it attempted to resolve this by providing annual social and environmental reports in relation to Australian operations for download, and making social and environmental presentations to its various stakeholders (these were later archived on its website).

There were not any major changes occurring on Company C's website in the first half of the year. It did mention in February that it won an environmental award in the previous year as part of its social and environmental news update. In the second half of the year, there were two major changes on the website. In September, the

company released its sustainability report. Only the summary report was in hardcopy; the detailed report was presented as a web portal and available for download as well. Stakeholders could also email the company and request of the detailed report to be sent to them. This enabled the company to interact with its stakeholders; albeit electronically.

The other major change on the company's website in the second half of 2003 was an environmental, health safety and community briefing which was webcasted from London through the company's website. This highlighted that the company was looking at using the presentation, timeliness and accessibility benefit of the web to communicate environmental issues.

In summary, there were variations across the three companies' web based environmental reporting practice. Company A engaged in continuous reporting and moved to reporting primarily through its website. There was a range of timely environmental performance, and positive and negative environmental information available. Company B on the other hand was influenced by its global company's web based environmental strategy. This led to a transfer of certain existing information to the global website and also a reduction in certain disclosure. The disclosure of annual social and environmental reports and archived presentations were used to counter the restrictions the company faced in its web based environmental reporting. Lastly, Company C used the web as a platform to complement its annual reporting through print media. It also showed evidence of a willingness to utilise web based technology more extensively through the use of webcasts.

Postscript

Company A archived its website for environmental performance information related to its 2004 operations. This archived website was attested by independent auditors and was linked to its current environmental webpage. However, the company was taken over in June, 2005 by a multinational, which led to its web based environmental reporting practice being abandoned. The web portal for environmental issues was stagnant from May. Immediately after the takeover, the company's website was taken offline. When its URL was typed, users were directed to its parent company's website.

The web based environmental communication practice of the other two companies appeared similar to that observed during the daily website monitoring. Company B's website continued to have the reduced environmental information content as observed during the longitudinal website analysis. Company C's website had the same features as that observed through the website analysis and it also undertook a webcast of its Health, Safety and Environment briefing in 2005.

**Discussion**

This study has extended the literature on web based environmental reporting by adding a new dimension to website analysis. The longitudinal approach towards this research has enabled rich insights to be gained into the current practices of three companies in the Australian minerals industry. These findings have implications for other companies in the minerals industry as well as providing insights to companies in other industries that may seek to engage in web based environmental reporting.

All three companies that were studied were at different stages of web based environmental reporting. Initially, both Companies A and C used web portals to present detailed periodic sustainability reports. Only a summary version of these

reports was provided in hardcopy form. Emphasis was on utilising the web to present and organize environmental information succinctly and to make this accessible to various stakeholders. Some level of interaction was also possible through electronic feedback on web based reports. Managers of company A realized that the web can also provide timely information and therefore, adopted a continuous reporting strategy. This led to extensive environmental information being presented on the website, with emphasis being on general environmental issues, environmental performance and initiatives, and environmental incidents. However, the company was taken over and its practice is only documented in the current study.

Company C on the other hand mainly relied on its annual sustainability reports. However, it did make use of web based technology to communicate with its stakeholders, suggesting that the company acknowledged that the web can be utilised effectively to communicate environmental information.

Company B went through a major restructuring of its websites and its web environmental reporting was restricted. It appears that pressures from the parent company led it to using the website to make environmental information such as environmental reports and presentations accessible to its stakeholders.

This research has contributed theoretically by adding to the limited literature on web based environmental reporting. It has also developed a new method towards analysing environmental information on corporate websites. At the practical level, the study provides an understanding of current web based environmental reporting practices in an environmentally sensitive industry.

Future research is needed to complement the current study. Studies could utilise the methods for this study and focus on other industries or even look at best practices in

web based environmental reporting. Interviews can also be used to complement the data gathered from longitudinal website analysis. This will provide a comprehensive understanding of current practices.

Research into environmental reporting through the Internet can also transcend beyond the web. The use of intranets and extranets by companies can be studied to gain an understanding of internal communication or communication with those stakeholders that a company has an established relationship. Similarly, the extent to which stakeholders use the web to oversee company activities can also be studied. For instance, McSpotlight (http://www.mcspotlight.org/) has been used by activists to place pressure on McDonald's business activities.

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