The World Wide Web and Environmental Communication:
A study into current practices
in the Australian Minerals Industry

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September 2007
Declaration

I, Sumit K. Lodhia, hereby certify that this thesis, entitled ‘The World Wide Web and Environmental Communication: A study into current practices in the Australian Minerals Industry’, submitted for examination in the degree of Doctor of Philosophy, is the result of my own original work and that where reference is made to the work of others, acknowledgement is duly given.

………………

(Sumit K. Lodhia)
Acknowledgements

This thesis is the result of an arduous journey that began almost six years ago. A number of people have helped me along the way either through academic advice or through moral support.

To my family I owe my gratitude for putting up with my occasional fickleness over the last few years and for supporting me in all my academic endeavours. My parents, Kishore and Saraswati Lodhia, have always been proud of my academic achievements, recognising my capabilities and inspiring me to do better. My sisters, Mohini and Yogeeta, and brothers–in-law, Chandresh Raniga and Ashvin Pala, have always been there for me and their belief in me will always be appreciated. My nephews Ameet and Kaveet Raniga have always encouraged me to get on with my PhD so that their ‘Mama’ could spend greater quality time with them.

My supervisors have stood by me in good and bad times. Professor Shirley Gregor, the chair of my supervisory panel, is someone who has always believed in me and supported me. Professor Roger Burritt of the University of South Australia guided me in the initial stages of my thesis and always stressed that social and environmental accounting research is not just an academic endeavour but also an effort to make the world a better place to live in. Associate Professor Geoff Frost of the University of Sydney was my role model, someone who always had time for me and whose frank but honest comments inspired me to work harder and harder. I would also like to thank Professor Russel Craig of the University of Toronto as well as Professor Gary Monroe and Dr Richard Winter, both of the Australian National University. These individuals served on my supervisory panel in the earlier stages of this project.

Professor Kerry Jacobs, Dr Walter Fernandez and Dr Nigel Martin took time off from their busy schedule to provide feedback on the final draft of my thesis. I will always appreciate their efforts. Dr Gail Creswell of the Academic Learning and Skills Centre advised on writing styles; her input enabled me to enhance my academic writing. Her motivation and support are duly acknowledged. Dr Myra Whitney copyedited the final thesis; her support is appreciated.
The administrative staff at my school were very helpful and their encouragement at all times is immensely appreciated. They include Antoinette Bosman, Nathan Daley, Laura Withers, Gail McNamara and Samantha Dawson, whose environmental values match my own. A special thanks is extended to Dora Gava, who has provided great motivational support over the years, and Shufen Lin, who is a great friend and well-wisher. Fellow PhD students at the ANU Jacqueline Birt, Sorin Daniliuc and Mohammed Behaboudi also deserve a special mention for their collegiality. My friends and former PhD students Angela Maharaj, Chris Chan, Colleen Hayes and Katherine Trebeck were always there for me to share the frustration and joys of thesis writing.

I would like to dedicate this thesis to the loving memory of my late grandfather, Harilal Ranchod Lodhia. His ‘thirst’ for knowledge has always inspired me and is one of the major reasons for my becoming an academic.
Publications

Refereed journal articles based on the initial stages of the literature review


Refereed journal articles based on the initial stages of data collection


Refereed conference proceedings based on the initial stages of data collection


Refereed conference proceedings based on the initial stages of the research


Discussion papers


Professional article

Abstract

This thesis explores the factors that influence the extent to which the World Wide Web (henceforth web) is utilised by corporations in an environmentally sensitive industry to communicate with their stakeholders in relation to environmental issues. The study initially establishes, in theory, the communication potential of the web and possible factors which can impact on the extent to which this potential is utilised for environmental communication. Subsequently, it examines the use of the web by specific companies in the Australian minerals industry for communicating environmental issues to their stakeholders over time. Explanations for current practices are established through an analysis of the impact of the factors established in theory on web based environmental communication in the Australian minerals industry.

A model was established to guide the research process for this study. Drawing upon media richness theory (Daft & Lengel, 1984, 1986; Sproull, 1991; Valacich et al., 1993), the Media Richness Framework was developed to provide criteria for assessing the communication potential of the web. It was also posited that the extent to which this potential is utilised in practice is dependent on management’s web based communication needs. These needs incorporate timeliness, accessibility, presentation and organisation, and interaction. Contextual factors, which include limitations of web based technologies, economic, internal organisational and external stakeholder issues, influence these needs.

Case study research (Hagg & Hedlund, 1979; Yin, 2003a, 2003b; Scapens, 2004) was used as the methodological approach for this thesis in order to obtain an in-depth understanding of current web based environmental communication practices. An evaluation of the websites of mining companies was used as the basis for selecting three companies as cases. These cases involved a triangulation of approaches towards data collection: monitoring corporate websites on a regular basis; interviewing appropriate personnel in these organisations; and evaluating documents related to the companies’ environmental communication practice. Data gathered from interviews, websites and documents were analysed for individual cases and then through cross-case comparisons. The intention was to confirm the research model and to potentially extend it through a consideration of other factors not identified in theory but evident in current practices.
The findings of this research indicate that even though the web has the potential to enhance environmental communication in an environmentally sensitive industry that is subject to extensive stakeholder pressures, there is variation in its use by companies in the Australian minerals industry. An evaluation of the practices of the three chosen companies highlighted that while the web is used extensively by these companies in comparison with other corporations in the industry, the case study companies were at different stages of web based environmental communication.

Management’s web based environmental communication needs and the influence of contextual factors on these needs explained the variation in web based environmental communication across all three companies. Moreover, two other factors emerged from the field; these are referred to as the double-edged sword and change in management philosophy. These findings from the field highlight that the need for communication through the web could have unintended consequences while a change in management could alter the current approach towards web based environmental communication.

This study into the use of the web in the Australian minerals industry highlights that the medium has an impact on environmental communication practice. Further research could assess the communication potential of the various media used for environmental communication in order to extend the explanatory power of the current study. This study also outlines arguments in support of extending theorisation in environmental communication. Existing theories for social and environmental accounting, such as stakeholder and legitimacy theory (Roberts, 1992; Lindblom, 1993; Deegan, 2002) need to be accompanied by other theoretical perspectives in order to capture a range of potential factors that could impact environmental communication practices. Such insights could provide a comprehensive understanding of environmental communication in different contexts.
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Chapter One: Introduction

1.1 Background

The importance of environmental issues to humans has increased in significance over the last 50 years (Moore et al., 1996; Theodore & Theodore, 1996; Steffen et al., 2004; Brown, 2005). This significance has been accompanied more recently by recognition of the need for corporations to manage their environmental impacts and communicate with stakeholders in relation to environmental issues (Gray, 1990; Gray et al., 1993). Consequently, the management and communication of environmental issues has become an essential component of corporate activities (Schaltegger & Burritt, 2000; Gray & Bebbington, 2001; Schaltegger et al., 2003).

The increasing importance of corporate environmental issues\(^1\) is paralleled by the fundamental role of information and communication technologies in corporate activities (Brynjolsson & Hitt, 2000; Gregor et al., 2004). This development is in conjunction with the increased use of the Internet, especially its World Wide Web (web) facility (De Maeyer, 1997; Feher & Towell, 1997; Hoffman et al., 2004). In addition to its electronic business potential (Applegate et al., 1996; Zwass, 1996; Earl & Khan, 2001), the web provides the potential for corporations to enhance the communication process (Newhagen & Rafaeli, 1996; Richardson & Scholz, 2000; Ihator, 2001, Walther et al., 2005), which can include financial (Lymer, 1997, 1999; Lymer et al., 1999; FASB, 2000) as well as social and environmental (Jones et al., 1998; SustainAbility/UNEP, 1999, 2001; ACCA, 2001b; Isenmann & Lenz, 2001, 2002) communication.

Corporations have moved from providing a brief summary of environmental issues in annual reports to preparing detailed social and environmental reports and communicating through electronic media such as the web (SustainAbility/UNEP, 2001, 2004). Guidelines such as the Global Reporting Initiative (GRI) have been developed to encourage companies to report environmental issues (GRI, 2002). There has also been increasing attention devoted to engaging stakeholders in a company’s environmental agenda (AccountAbility, 1999; Andriof et al., 2002, 2003). These developments indicate that environmental communication, which involves engagement with

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\(^1\) For the purposes of this thesis, corporate environmental issues are taken to include the impact of corporate activities on the environment as well as the impact the environment has on the corporation.
stakeholders in addition to environmental disclosure, is now a critical component of the corporate communication process. In essence, environmental communication requires corporations to be accountable to their stakeholders in relation to environmental issues (Gray et al., 1996; Gray & Bebbington, 2001).

Traditional means of communication used by organisations to communicate environmental issues to stakeholders include annual reports and social and environmental reports (Tilt, 2001). These reports are periodic and are complemented by media releases (Brown & Deegan, 1998; Deegan et al., 2002), newsletters (Tilt, 2001) and advertisements and brochures (Zeghal & Ahmed, 1990) to ensure that environmental information is available to stakeholders on a regular basis. More recently, the web has begun to be utilised for environmental communication (Jones et al., 1998; UNEP/SustainAbility, 1999).

In light of the various media available for environmental communication, it is useful to consider the role of the medium. This issue has received limited coverage in the literature, where the emphasis has been primarily on environmental reporting and, more specifically, the content of environmental disclosure (see, for instance, Roberts, 1992; Patten, 1992; Gray et al., 1995; Deegan & Gordon, 1996; Neu et al., 1998; O’Donovan, 1999, 2002a; Cormier & Gordon, 2001; Campbell, 2003).

It is argued in this thesis that the use of the web can extend the existing capabilities of traditional environmental communication media. Thus, a need arises for literature that examines the medium utilised for environmental communication—more specifically, the use of the communication potential of the web in practice.

In recent times, limited literature has explored the communication of environmental issues through corporate websites (see, for instance, Jones et al., 1999; Craven & Otsman, 1999; Williams & Pei, 1999; SustainAbility/UNEP, 1999, 2001; Patten, 2002; Rikhardsson et al., 2002; Andrew, 2003; Cormier & Magnan, 2003; Cooper, 2003; Patten & Crampton, 2004; Adams & Frost, 2004; Unerman & Bennett, 2004; Campbell & Beck, 2004; Frost et al., 2005). However, an in-depth understanding of the corporate use of the communication potential of the web for communicating environmental issues to stakeholders is lacking.
The majority of the literature has primarily provided a descriptive and general overview of the use of the web for environmental communication but has yet to explore in depth the issues contributing to the current use of the web. There is a need to move beyond general studies and explore the factors that influence the extent to which the web is utilised for environmental communication in a particular context.

The use of the web for environmental communication in a specific industry is of interest because the situation in a particular industry can differ from the findings associated with the general studies that focus on a number of different industries. Studies of a particular context have the potential to provide an in-depth understanding of present practices (Yin, 2003a) that can inform future work in this area. For instance, it is of academic and practitioner interest to explore the use of the web for environmental communication in an industry with highly visible environmental impacts and constant stakeholder pressures. Companies in such an industry are likely to have an extensive need to communicate with their stakeholders (Wilmshurst & Frost, 2000; Savage et al., 2002; Campbell, 2003, 2004). Therefore, an examination of the use of the web for such communication provides useful insights into the conditions that enable and constrain web based environmental communication.

The remainder of this chapter is organised in the following manner. In section 1.2, the research question and objectives for this thesis are articulated. The scope of the research and its justification are identified in section 1.3. An overview of the theoretical perspective used in this study is presented in section 1.4, and methodological issues related to the research are explained in section 1.5. Finally, section 1.6 outlines the organisation of the rest of the thesis.

1.2 Research Question and Objectives

This research addresses the gaps in the literature identified in the preceding section by establishing how a particular medium—the web—extends the existing capabilities offered by traditional environmental communication media. It also examines the factors that influence the extent to which the potential of the web is utilised in an environmentally sensitive industry. The central research question for this thesis is:
What are the factors that influence the extent to which the web is utilised by corporations in an environmentally sensitive industry to communicate with their stakeholders in relation to environmental issues?

To address this question, the research needs to meet the following objectives:

- establish the extent to which the web is utilised for environmental communication by companies in an environmentally sensitive industry
- ascertain the factors that affect the use of the web for environmental communication by specific companies in an environmentally sensitive industry.

This thesis seeks to establish how the communicative potential of the web can be used for corporate environmental communication. It will examine its actual use in a particular environmentally sensitive industry—the Australian minerals industry. Whilst a description of present practices is crucial, it is equally important that explanations are developed regarding the use of the web for environmental communication. Such explanations will allow an understanding of the various factors that enable or constrain web based environmental communication.

1.3 Research Scope and Justification

The emphasis in this research is on understanding how corporate environmental issues are communicated to stakeholders. Environmental issues are of sufficient concern to merit exclusive attention as is evident from the extensive literature addressing environmental disclosure (Patten, 1992; Deegan & Gordon, 1996; Deegan & Rankin, 1996; Neu et al., 1998; O’Donovan, 1999, 2002a; Wilmshurst & Frost, 2000; Campbell, 2003, 2004). While social issues are equally important, they include, in addition to environmental issues, matters involving employees, community involvement, child labour, fair trade and ethics. Including this wide range of social issues\(^2\) (GRI, 2002) would make the scope of the research quite broad yet devoid of an in-depth understanding.

\(^2\) In the context of the minerals industry, in addition to environmental issues, company relationships with indigenous groups and mining worker conditions (for example, health and safety) could be regarded as critical social issues (IIED, 2002; MMSD, 2002a). Each of these issues provides scope for a major study. To avoid having a very broad study with inadequate depth, they were not included in this study.
The focus on Australian companies in this research was prompted by the recent development in Australia of various mandatory environmental reporting requirements and voluntary environmental initiatives (Burritt, 2002a, 2002b; Richards & Frieman, 2004). Mandatory requirements are covered by section 299(1)(f) of the Corporations Act 2001, which states that companies need to disclose details of their compliance with environmental legislation and maintain a national pollutant inventory (NPI) showing their emission levels. Voluntary initiatives include invitations to companies to sign a greenhouse challenge agreement and the public environmental reporting (PER) initiative. The former encourages a reduction of greenhouse emissions whereas the latter encourages the preparation of social and environmental reports. Initiatives such as NPI and PER involve the electronic presentation of information. NPI data and public social and environmental reports are available on the NPI and Australian Government Department of Environment and Heritage websites.

Given that the environmental performance of Australian companies is subject to mandatory and voluntary pressures, environmental issues need to be communicated to company stakeholders. There is also some emphasis in these initiatives on the use of the web to facilitate such communication. These developments highlight that the Australian context provides a useful scope for this research.

A specific understanding of existing practices in a particular industry is useful because prior research suggests that industry effects are positively related to environmental disclosure (Patten, 1991; Gray et al., 1995; Deegan & Gordon, 1996; Adams et al., 1998; Campbell, 2003, 2004; Cormier & Magnan, 2003). Companies in environmentally sensitive industries are likely to engage in environmental communication more extensively than companies in other industries due to their highly visible environmental impacts and constant stakeholder pressures (Wilmshurst & Frost, 2000; Savage et al., 2002; Campbell, 2003, 2004). Thus, practices in these industries can differ from the aggregated findings of the general studies on environmental communication. Such industries provide an opportunity for an in-depth study into the interactions that an organisation has with its stakeholders in relation to environmental issues coupled with the different situations in which environmental information is disclosed.

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3 Now referred to as Greenhouse Challenge Plus.
The Australian minerals industry was selected as the environmentally sensitive industry for this study because companies in this industry have extensive environmental impacts as a result of their operations (Rae & Rouse, 2001; ABS, 2003a, 2003b). Accordingly, these companies are subjected to close scrutiny from their stakeholders (MMSD/PWC, 2001; IIED, 2002; MMSD, 2002) and often need to communicate environmental information to them (Christopher et al., 1998, Peck & Sinding, 2003; Yongvanich & Guthrie, 2004). It has also been highlighted in the literature that these companies are the leaders in communicating environmental information (Peck & Sinding, 2003). However, little is known about their use of the web for environmental communication.

The research literature suggests that companies in Australia appear to be using the web extensively for building their corporate image through a significant emphasis on marketing (Adams & Frost, 2004). However, mining companies do not sell products directly to consumers and, therefore, have less need for marketing through the web. Conversely, their corporate image is often related to their environmental performance in addition to their social and economic performance (UNEP, 2000; IIED, 2002; MMSD, 2002).

The importance of environmental issues in the Australian minerals industry has resulted in the industry association for the Australian minerals industry, the Minerals Council of Australia (MCA), developing a number of social and environmental initiatives for its member companies. Members of the MCA initially signed up to an environmental management code (MCA, 2000). This code has subsequently been expanded into a sustainable development framework entitled ‘Enduring Value’ (MCA, 2004). These initiatives require mining corporations aligned with the industry association to improve their social and environmental performance and communicate this performance. Prior research has also indicated that these companies communicate environmental information to their stakeholders more extensively than their counterparts in the same industry (Christopher et al., 1998). This thesis focuses only on companies associated with the MCA because they have a greater need to engage with stakeholders and disclose environmental information to them in order to adhere to the requirements of the environmental initiatives of their industry association.
1.4 Theoretical Perspective

It is argued that a relationship exists between a corporation and its stakeholders regarding environmental issues. Stakeholders are concerned about an organisation’s environmental performance and the company addresses these concerns by managing environmental issues and stakeholder concerns. One way that stakeholders can be managed is through environmental communication. This thesis focuses on corporate environmental communication, particularly on the use of the medium to facilitate this process.

Environmental communication is the transmission of information about a corporation’s environmental management activities. It involves engagement with stakeholders about their environmental concerns and the disclosure of environmental information to them. Through the environmental communication process, a corporation also gains insights into its environmental management activities.

As discussed in section 1.1, prior research has focused primarily on environmental reporting. However, it has placed limited emphasis on the medium for communication. According to media richness theory (Daft & Lengel, 1984, 1986; Sproull, 1991; Valacich et al., 1993), communication can be facilitated effectively by a ‘rich’ medium. This research draws upon media richness theory to develop a Media Richness Framework for assessing the capabilities offered by the various media for communicating environmental issues. The framework highlights that the web extends the capabilities offered by traditional communication media.

While the Media Richness Framework is used in this study to assess the extent of web usage for environmental communication, it does not provide an understanding of the factors that influence the use of the web. This research identifies potential factors that can explain the communication potential of the web in practice. Management’s needs for communication through the web medium is a critical factor that affects the extent of web usage for environmental communication. These needs include timeliness, presentation and organisation, accessibility and interaction. Moreover, contextual factors influence management’s web based environmental communication needs. These factors include limitations of web based technologies, economic factors, internal organisational factors and external stakeholder influences. Thus, a combination of the
Media Richness Framework and potential factors that can affect web based environmental communication was used to develop the research model for this study.

The theoretical perspective for this study is explained in further detail in the literature review chapters (chapters two, three and four). It will then be applied to the web based environmental communication practices of specific companies in the Australian minerals industry so that the central research question and associated objectives for this thesis can be addressed.

1.5 Methodology

The case study approach (Hagg & Hedlund, 1979; Yin, 2003a, 2003b; Scapens, 2004) was utilised as the research strategy in this thesis because it enables an in-depth understanding of a particular context and emphasises the development of prior theoretical constructs to guide the research (Otley & Berry, 1994; Humphrey & Scapens, 1996; Yin, 2003a, 2003b; Scapens, 2004). These characteristics are aligned with the study’s research question and objectives, contextual requirements and theoretical perspective, as discussed in sections 1.2 to 1.4. The case study research design therefore guided the collection of data for this research.

The data for this research were collected in two phases. In the first phase (July 2003–December 2003), referred to as the general phase, an overview of the web based environmental communication practice of companies in the Australian minerals industry was used to identify potential companies as cases for an in-depth study. An understanding of the web based environmental communication practice of the selected companies was sought in the second phase (January 2004–February 2005), which is referred to as the company specific phase. In line with the fundamentals of case study research, the theoretical perspective adopted was used to shape the design for gathering data for all phases of the research.

An initial understanding of environmental communication in the Australian minerals industry was sought in the general research phase through documentary evidence and an interview with the MCA sustainable development officer. The websites of companies in the Australian minerals industry were then analysed in relation to the communication of

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Supplementary note: Specific details of the data collection process are provided in the methodology chapter.
environmental issues. Those companies that used the web extensively to communicate environmental information to stakeholders were identified.

Three companies were selected for the second research phase based on the analysis of websites as well as the ease of access to company personnel. One of these was an Australian company, another a former Australian company that recently was taken over by a multinational, while the third was a former Australian company that had merged with a multinational several years ago.

In the company specific phase, the use of the web by these companies to communicate environmental information to stakeholders was explored through a triangulation of data collection approaches. This encompassed website monitoring, interviews and documentary analysis.

The websites of the three companies were monitored on a daily basis for one year in order to gain further insights into the extent of web usage. A series of interviews was held with mining practitioners during the study, and corporate documents such as annual reports and social and environmental reports were accessed in order to identify the salient factors that explained the extent of web usage. Emphasis was on an in-depth examination of current practices of specific companies in order to develop an understanding of the factors which influence the extent to which the web is utilised for environmental communication in the Australian minerals industry.

1.6 Summary and Organisation of Thesis

This chapter has outlined the issues to be investigated in this study and specified its boundaries. It has also identified the theoretical and methodological approach of the research.

The second chapter places this research into its broader context by examining the importance of environmental issues and their effect on corporations and stakeholders. The need for corporations to manage their environmental impacts and stakeholders is highlighted. The concept of environmental communication is articulated, its theoretical perspectives are specified and the research literature is discussed. This chapter also
identifies the gaps in existing literature, particularly the lack of emphasis on the medium used for environmental communication.

Chapter Three describes the various media for environmental communication and emphasises the communication potential of each medium. The Media Richness Framework is developed to provide a basis for assessing the communication potential of the various media. This framework highlights that the web is a relatively rich medium for environmental communication. An analysis of the literature indicates that there is a need for studies that go beyond the assessment of web usage to explore the factors that influence the use of the web for environmental communication. Accordingly, this study investigates both the extent of web usage and the factors that can explain current practices. The research model used to address these objectives is outlined in Chapter Four. Specific themes were developed from the model to guide the research process.

Chapter Five discusses the methodological approach, context and design of the study. It elaborates on the multiple methods of data collection and analysis employed and provides a detailed rationale for their use. Details on the approaches utilised to ensure the validity and reliability of the research, compilation of the cases and methodological limitations are also provided in this chapter.

The next four chapters present the results of the study. In Chapter Six, a general overview of the communication of environmental issues through the web in Australia’s minerals industry is used to select the three companies for the case studies. Chapters seven to nine present the case studies of the web based environmental communication practice of the three companies. Emphasis is on an analysis of the interview data, documents and website monitoring in order to address the research objectives and themes for the study.

In the penultimate chapter, a cross-case analysis is conducted to establish analytical generalisations of the factors that influence web based environmental communication. The final chapter brings together the theoretical and practical issues related to this research. It highlights the significance of the research findings, establishes the study’s contributions, identifies possible limitations and stipulates potential future research directions.
Chapter Two: The Environment, Corporations and Stakeholders: A Need for Corporate Environmental Communication

2.1 Introduction

This chapter describes the interrelationships among the environment, corporations and stakeholders. Section 2.2 establishes the critical importance of environmental matters by discussing significant environmental issues that are of global and local concern. Some of the key international and Australian developments that seek to address environmental issues are also discussed in order to highlight the increasing emphasis on addressing environmental matters internationally and locally.

Section 2.3 highlights the role of corporations in environmental issues. Corporations have an impact on the environment and are in turn affected by the environment. Thus, they have responsibilities towards the environment. International and local developments reflect the need for companies to address their environmental responsibilities. The focus of this thesis is on corporate responsibilities towards the environment and stakeholders—parties concerned about the effect of environmental issues on their welfare. Corporations can address these responsibilities by managing environmental issues and demonstrating to stakeholders their commitment to environmental protection.

Stakeholders are concerned about the impact of environmental issues on their welfare. A range of different stakeholders have concerns about the impact of corporations on the environment, and these are discussed in section 2.4. Corporations are therefore required to manage the needs of these stakeholders.

Corporate environmental communication can be utilised to manage stakeholders, and this is discussed in section 2.5. Environmental communication includes engagement with stakeholders and environmental reporting. An overview of the theoretical perspectives related to environmental communication coupled with a discussion of prior studies that have utilised these perspectives will reveal that the role of the medium in
corporate environmental communication has not been adequately addressed in the research literature.

2.2 Environmental Issues and their Significance

Some of the critical environmental issues that humans face in an increasingly global society include air pollution through the production of greenhouse gases, chemicals and other potentially hazardous substances; global warming caused by extensive energy usage, which in turn could lead to climate change; threats to biodiversity and land degradation through habitat destruction and deforestation; water pollution, which could lead to the depletion of marine resources and access to fresh water; noise pollution; and the production of excessive waste with inadequate disposal systems (Beder, 1996; Theodore & Theodore, 1996; Steffen et al., 2004; Brown, 2005; UNEP, 2005).

The major environmental issues in Australia parallel those existing globally. These are air pollution in the form of greenhouse gases produced largely from industrial activities, marine pollution and water supply issues (for example, management of the Murray-Darling Basin\(^5\)), and threats to biodiversity and land degradation arising from industries such as agriculture, forestry and mining (Commonwealth of Australia, 1996, 2001; ABS, 2001, 2003a, 2003b; Goldie et al., 2005). Australia also shares the global concern for climate change resulting from its extensive energy production and usage (Commonwealth of Australia, 2001; ABS, 2003a, 2003b).

A range of scientific evidence suggests that environmental issues have reached a critical stage. For instance, Steffen et al. (2004) argue that our activities are affecting global systems so adversely that natural systems are being altered in ways which threaten the future survival of the human species. Thomas et al. (2004) predict that by the middle of the century, under a mid-range global warming scenario, a quarter of species on earth will be extinct. The World Wide Fund for Nature (WWF), in its ‘Living Planet’ report (WWF, 2004), establishes that species population is declining and human demand on the biosphere is increasing. The report concludes that ‘Ecosystems are suffering, the global climate is changing, and the further we continue down this path of unsustainable

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\(^5\) This basin contains Australian’s largest river network, providing water usage to agricultural industries (Aplin et al., 1999). The water resources of the basin are shared by four Australian states and require a collaborative approach to water management involving not just these states but also the federal government (Department of Environment and Heritage website, [http://www.deh.gov.au/](http://www.deh.gov.au/), accessed 8 November, 2004).
consumption and exploitation, the more difficult it will become to protect and restore the biodiversity that remains.’ (WWF, 2004:1). UNEP (2005), in its global environmental outlook series for 2004–05, highlights that extreme weather events, a rise in carbon dioxide levels, stronger evidence of melting glaciers and icecaps and alarming surveys of the rate of species loss are pressing the planet’s capacity to support our needs.

The severity of environmental issues indicates that humans must adjust to live in harmony with their environment in order to ensure a decent quality of life for themselves and future generations (Aplin et al., 1999; Steffen et al., 2004; Brown, 2005; Goldie et al., 2005; UNEP, 2005). Consequently, concern for the environment has reached unprecedented levels in recent times, with international agencies being formed and global summits held to address environmental protection (Elliot, 2004). Environmentalism is now an important element of the global public agenda (Elliot, 2004; Dovers, 2005).

Public concern for the environment has resulted in two waves of the environmentalism movement (Beder, 1996). The first wave emerged in the 1960s. It emphasised that a global ecological crisis was inevitable if present means of economic development and technological usage persisted. This movement was characterised as anti-development and was subjected to massive opposition in the 1980s.

The late 1980s experienced another wave in environmentalism resulting in the concept of sustainable development being coined by the Brundtland commission (Commission for the Future, 1987). Sustainable development was defined in the report of the commission as:

...meeting the needs of the present without compromising the ability of future generations to meet their needs.

This movement is still recognised today because it implies that environmental protection and development can be complementary (Beder, 1996). In effect, it is suggested that economic development has a key role in addressing environmental and social issues (Commission for the Future, 1987)6.

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6 This is not to imply that sustainable development is without its critics. There have been certain criticisms levelled at the sustainable development concept (Redclift, 1987; Lomborg, 2001). However, it appears to have global acceptance in reflecting a common approach towards addressing environmental issues, as highlighted by the evidence presented in this section.
The pursuit of sustainable development has resulted in a series of global environmental summits (Elliot, 2004) that has the goal of bringing together the various parties that have a stake in environmental issues. The United Nations Environmental Programme (UNEP) has been at the forefront of these developments (UNEP webpage\(^7\)), organising the Rio Earth Summit in 1992. An action plan entitled ‘Agenda 21’ was developed at this meeting which provided a comprehensive program of action for addressing sustainable development issues for the 21\(^{st}\) century. The Rio event was succeeded by two further summits in New York in 1997 (Rio +5) and Johannesburg in 2002 (Rio +10), which have provided further plans for implementing sustainability issues. Moreover, the United Nations (UN) Framework Convention on Climate Change in Kyoto established a protocol for emission targets for nations with the aim of significantly reducing pollution associated with industrial activity (UN, 1998). The UN also considers environmental sustainability as one of the millennium development goals established in 2000 (UN Millennium Development Goals webpage\(^8\)).

In Australia, legislation is the primary environmental policy tool used to ensure environmental protection. Its enforcement occurs at all levels of government\(^9\) (Bates, 2002; Department of Environment and Heritage website\(^10\)). For instance, the Environmental Protection and Biodiversity Conservation (EPBC) Act was passed in 1999 to emphasise the importance of environmental protection in Australia (Bates, 2002). Moreover, the Australian Commonwealth Government has responded to calls for a global shift towards sustainability by developing a national strategy for sustainable development (NSESD) (Commonwealth of Australia, 1992). It has refined the sustainable development concept by establishing the notion of ecological sustainable development, which is defined as:

\[
\text{…using, conserving and enhancing the community’s resources so that ecological processes, on which life depends, are maintained, and quality of life for both present and future generations is increased. (Commonwealth of Australia, 1992).}
\]

\(^9\) Australia has three tiers of government. The Commonwealth Government, or federal government, is responsible for national affairs under the Australian Constitution 1901. State and territory governments administer issues not listed as federal government responsibility under the constitution. Local governments are created by legislation at the state and territory level. See [http://australianpolitics.com/constitution/](http://australianpolitics.com/constitution/).
Thus, the Australian government’s focus on sustainable development is primarily based on the ecological issues associated with sustainable development, providing an incentive for the emphasis on environmental issues identified in this research.

The NSESD focuses on implementing the strategies identified in Agenda 21 within the Australian context (Commonwealth of Australia, 1992). This strategy has been adopted by all three tiers of government. A range of policies to deal with specific environmental issues has been developed on the basis of the national strategy.

In summary, environmental issues are significant and need to be addressed on global and local scales. There have been numerous developments involving global agencies, such as the United Nations, and sovereign nations like Australia to encourage environmental protection. In addition to these parties, corporations also have a critical role in addressing environmental issues.

2.3 Corporations and Environmental Issues

The corporation, also referred to as the company, firm or business, is an institution that undertakes economic activities (Post et al., 2002; Schaltegger et al., 2003; Bakan, 2004). It is funded by its shareholders and run by a board of directors and executive managers who are often separate from the shareholders. The corporation is a separate legal entity with responsibility for all its activities (Post et al., 2002; Schaltegger et al., 2003).

Over the last 150 years, the corporation has risen from relative obscurity to become the world’s dominant economic institution (Bakan, 2004). Such is its dominance that Welford (1997) remarks that out of the largest 100 economic institutions globally, almost half comprise corporations while the other half are countries. Moreover, Zadek (1999, 2001) reports that the top 200 corporations have sales equivalent to one quarter of the world’s economic activity.

Corporations provide numerous benefits to humans (Zadek, 2001). Their fundamental activity is to produce goods and services for human consumption (Beder, 1996). In addition to consumption benefits, living standards, especially in the developed world, have been enhanced through corporate activity (Zadek, 2001). Thus, the existence of corporations is critical for the development and survival of contemporary society.
In conjunction with the beneficial impact of corporations on society, progress has been accompanied by adverse impacts, termed negative externalities by economists (Friedman, 1962). A major concern is the undesirable impacts of corporate activity on the environment (Hawken, 1993; Beder, 1996; Welford, 1997; Schaltegger & Burritt, 2000; Gray & Bebbington, 2001), referred to as environmental impacts. The economic activities of corporations result in the consumption of materials, resources and energy and the creation of waste products that are often disposed into the land, air or water (Beder, 1996). Conversely, the physical environment impacts corporations, with adverse environmental effects having the potential to negatively affect corporate activities. All these impacts have the potential to contribute to the global and local environmental issues identified in the previous section. Some authors even argue that we are facing an environmental crisis as a result of corporate activities (Hawken, 1993; Welford, 1997).

Corporate effects on the environment received significant attention in the 1980s as a result of certain environmental incidents. The Bhopal gas disaster in 1984 (Shrivastava, 1992) and the Exxon Valdez oil spill of 1989 (Patten, 1992) are examples of widely publicised global incidents that highlighted the extent to which corporate activities have the potential to degrade the environment. Hawken (1993) argues that environmental issues have increased in significance over time because resources are limited, with some nearing depletion. Thus, the legitimacy of corporations has been increasingly questioned in recent times (Korten, 1995; Bakan, 2004), leading to a critical need for corporate environmental responsibility.

The need for corporations to be responsible for their environmental issues is subject to extensive debate and has resulted in two distinct perspectives. One school of thought considers businesses as primarily existing to make profits. For instance, Friedman (1962: 133) posits:

*Few trends would so thoroughly undermine the very foundations of our free society as the acceptance by corporate officials of a social responsibility other than to make as much money for their shareholders as they possibly can.*

Such views have also been reiterated in the more recent literature (Benston, 1982; Henderson, 2005).

Conversely, another school of thought argues that businesses have responsibilities for the environment which extend beyond their profit making aspirations (Elkington, 1994, 1997, 2005; Gray et al., 1996; Schaltegger & Burritt, 2000; Gray & Bebbington, 2001).
In line with the arguments of Welford (1997) and Zadek (1999, 2001) discussed earlier, it is suggested that only corporations have the power, resources and global reach to resolve environmental issues which they have themselves been instrumental in creating (see also Hawken, 1993; Hart, 1997). Hawken (1993:17) remarks:

*Business is the problem and it must be part of the solution.*

International developments over the last decade indicate that the second viewpoint is more widely accepted in contemporary society. These developments highlight the need for corporations to recognise their contribution to addressing environmental issues. Many companies signed up to the Valdez principles\(^{11}\) of the Coalition for Environmentally Responsible Economies (CERES) in the early 1990s (Macve & Carey, 1992; Gray & Bebbington, 2001), whereby they acknowledged that they have a direct responsibility for environmental issues\(^{12}\). The International Chamber of Commerce also launched its Business Charter for Sustainable Development (ICC BSD) in the 1990s, reflecting a recognition that corporations have a role in addressing environmental issues (Gray et al., 1993; Gray & Bebbington, 2001). Moreover, in response to the Rio Earth Summit, the World Business Council for Sustainable Development was established to address the role corporations have in striving for sustainability\(^{13}\).

More recently, the UN Global Compact\(^{14}\) has encouraged companies to adhere to 10 principles in the areas of human rights, labour, environment and anti-corruption. The Organisation for Economic Cooperation and Development (OECD) revised guidelines for multinational enterprises also considers environmental issues (OECD, 2000). At the industry level, the responsible care program was developed in the chemicals industry in response to the Bhopal disaster. This requires corporate commitment to high levels of environmental, health and safety protection by chemical companies (Prakash, 1999; King & Lennox, 2000). These are some developments which indicate that corporations are now cognisant of their vital role in addressing significant environmental issues. The same conclusion can also be drawn from environmental developments in Australia.

In the Australian context, mandatory environmental requirements and voluntary environmental initiatives emphasise corporate responsibilities for environmental issues.

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\(^{11}\) Now referred to as Ceres Principles.

\(^{12}\) These are, however, broad standards which do not require the specific monitoring of compliance.


Mandatory requirements include the National Pollutant Inventory (NPI) and the requirements for environmental performance disclosure under corporate law. The major voluntary environmental initiatives include the Greenhouse Challenge, Public Environmental Reporting and industry specific initiatives.

The NPI initiative is an Internet based national public database of pollution emissions in Australia that is accessible to the general public (Burritt, 2002a; Richards & Frieman, 2004). Industry and non-industry facilities are required to report on their emissions into the air, land and water for 90 substances listed on the NPI. The NPI homepage\(^{15}\) states that the initiative has been designed to satisfy community demand for this information and to increase the public’s understanding of the relative environmental impact of local industry and everyday activities.

Under section 299(1)(f) of the Corporations Act 2001, companies in Australia are required to disclose their compliance with environmental regulation in annual reports. Moreover, the Corporate Law Economic Reform Program (Audit reform and corporate disclosure) Bill 2003 (Cth) (CLERP 9) requires that, in addition to addressing compliance with environmental regulation, companies need to provide information on the potential effect of significant environmental issues such as climate change and greenhouse emissions on operations, business strategy and future financial prospects (Richards & Frieman, 2004). Therefore, Australian companies have a statutory requirement to communicate aspects of their environmental performance, highlighting the linkage between business activities and environmental issues.

Voluntary initiatives in Australia also have extensive corporate involvement. The Greenhouse Challenge program encourages signatories to reduce their greenhouse emissions and report their progress in achieving these reductions to the Department of Environment and Heritage (DEH) (Burritt, 2002a; Richards & Frieman, 2004). DEH also encourages the public disclosure of environmental information through its Public Environmental Reporting initiative (Burritt, 2002b). There are also voluntary initiatives for companies in specific industries in Australia, such as, for example, the National Packaging Covenant for the consumer packaging industry (ANZECC, 1999). This

highlights the extent to which specific industries are addressing concerns about the environmental performance of their companies.

Corporations can address their environmental responsibilities through corporate environmental management (Welford, 1998; Schaltegger & Burritt, 2000; Gray & Bebbington, 2001; Schaltegger et al., 2003). This process is taken to include all activities that corporations undertake to manage their environmental issues. Environmental management can include the establishment of environmental policies, environmental audit and management systems, accounting for energy, waste packaging and recycling, investment appraisal and budgeting as well as lifecycle assessment and mass balance (see Gray & Bebbington, 2001). In essence, all internal activities that an organisation undertakes to manage its environmental impacts and the effect of the environment on its business operations can be regarded as environmental management.

In addition to managing environmental issues, corporations also need to manage the needs of parties affected by these issues. These parties are referred to as stakeholders.

2.4 Corporations and Stakeholders

An early definition of a stakeholder put forward by Freeman (1984:46) is:

...any group or individual who can affect or is affected by the achievement of the organisation’s objectives.

Clarkson (1995:106) has refined this definition by suggesting that stakeholders are:

...persons or groups that have or claim ownership, rights or interests in a corporation and its activities, past, present or future.

Stakeholders with an environmental concern can include shareholders, employees, suppliers and lenders, industry associations, customers, government and regulatory bodies, non-governmental organisations (including environmental lobby groups), the media, local community and the general public. The stakeholder model illustrated in Figure 2.1 highlights that stakeholders and the corporation have a dual relationship whereby the existence of each party is regarded as crucial for the other (Freeman, 1984, 2004; Donaldson & Preston, 1995; Post et al., 2002). An organisation affects stakeholders and stakeholders in turn can affect an organisation (Freeman, 1994, 2004; Post et al., 2002). Moreover, a corporation can have linkages with multiple stakeholders (Freeman, 1984; Post et al., 2002).
Shareholders can be interested in the environmental impact of their corporation’s operations (Macve & Carey, 1992; Schaltegger & Burritt, 2000; Schaltegger et al., 2003). Threats of adverse publicity and potential business shutdowns have led to shareholders expecting their companies to be environmentally conscious. Ethical investments have also emerged recently, leading to an increasing need for environmentally sensitive business operations (Frost et al., 2004).

Employees are concerned with the corporation’s environmental position as it provides an indication of the future viability of their employment and reflects on company image and pride (Macve & Carey, 1992). Companies with a poor image may be unable to attract prospective employees (Dowling & Pfeffer, 1975; Lindblom, 1993).

Suppliers and lenders are interested in the corporation’s environmental status and expect it to function as a going concern (Macve & Carey, 1992; Gray et al., 1993; Schaltegger et al., 2003). They will be concerned about the company’s image in relation to

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16. They include the various levels of management.
environmental issues because potential adverse corporate publicity has an impact on their own welfare. Some companies even extend their environmental responsibilities to their entire value chain, ensuring that their business partners are environmentally responsible (Schaltegger et al., 2003).

Industry associations can also be concerned with the environmental impacts of companies in their industry (Schaltegger et al., 2003). This concern is stronger for corporations operating in environmentally sensitive industries. Some industry associations, such as, for example, the Australian Petroleum Production and Exploration Association (APPEA) have implemented a code of environmental practice (APPEA, 1996) for their members that requires them to improve their environmental performance.

Customers can demand high quality and environmentally benign products from corporations (Macve & Carey, 1992; Schaltegger et al., 2003). Growth in consumer awareness over the years has led to customers being selective in their product choice; they will refuse to purchase goods that are the result of environmentally insensitive production and will require information on product development. Certain businesses even use eco-labelling to demonstrate to consumers their commitment to addressing environmental issues.

Government and regulatory bodies, through mandatory requirements and voluntary initiatives, try to ensure that corporations demonstrate consideration for the environment (Macve & Carey, 1992; Schaltegger et al., 2003). Environmental legislation and licences are used to monitor the impact of business operations on the environment. Fines can be imposed on companies found to be violating environmental protection requirements (Bates, 2002). Voluntary initiatives can also be useful in encouraging businesses to improve their environmental performance.

Non-governmental organisations (NGOs), such as environment lobby groups, tend to monitor corporations’ environmental performance (Tilt, 1994; Schaltegger et al., 2003). Negative campaigns by them can have a damaging impact on corporations. Most organisations treat NGOs very seriously. More recently, NGOs have started to collaborate with companies on certain projects with the aim of reducing corporate environmental impacts (Fielder & Deegan, 2002).
The media has a similar ‘watchdog’ role to that of NGOs. It is instrumental in shaping public opinion about a corporation’s environmental performance (Brown & Deegan, 1998). Corporations rely extensively on the media as a medium for gaining the support of broader stakeholders.

The local community is affected by the environmental activities of a corporation at a particular site (Schaltegger et al., 2003). Local residents need to be aware of the company’s environmental impacts on their welfare. Concern for the environment from the general public has led to corporations facing extensive pressures in relation to their environmental performance (Macve & Carey, 1992). Public pressure is one of the paramount motives for organisations managing their environmental performance (Patten, 1991).

Rowley (1997) highlights that stakeholders can form networks and work together to achieve common goals. Thus, rather than having a relationship between a company and each stakeholder group as depicted in Figure 2.1, it is possible to have a network of stakeholders that places pressure on an organisation to address its social and environmental responsibilities. For instance, NGOs can represent stakeholder groups, such as the local community, and lobby against corporations. Stakeholders can interact with regulators and express their concerns about corporate activity. Conversely, companies can also form alliances to deal with major stakeholder groups. A common example is industry associations, where companies can address issues of common interest with stakeholders via the industry body rather than on an individual basis.

The discussion so far indicates that there is a range of stakeholders with environmental concerns. These extend beyond the financial stakeholders, such as shareholders and lenders. Freeman (1984) indicates that over time perceptions of corporations have moved from production and managerial views to encompass stakeholder views. The production view involves a firm having a relationship only with its suppliers and customers. This view was succeeded by the managerial view, whereby management was separated from ownership and corporations emerged. In addition to suppliers and customers, emphasis was placed on shareholders (owners); managers, who were responsible for controlling the resources entrusted to them; and employees, who carried out the tasks required by managers. Recently, the stakeholder view has become
prominent, whereby corporations recognise that a range of parties ‘hold a stake’ in their activities.

Every company is said to have multiple stakeholders. These converge into major stakeholder groups, each with unique patterns of influence (Rowley, 1997; Andriof & Waddock, 2002). Managing these stakeholders is critically important to an organisation’s survival (Freeman, 1984; Clarkson, 1995; Mitchell et al., 1997; Post et al., 2002; Carroll & Bucholtz, 2004). Stakeholder management has been defined by Post et al. (2002:20) as ‘management practices that reflect awareness of and response to the legitimate concern of the multiple constituencies of the corporations.’

Companies do not usually manage stakeholders on an individual basis. They often deal with the simultaneous demand of major stakeholder groups (Clarkson, 1995; Mitchell et al., 1997; Rowley, 1997; Andriof & Waddock, 2002). Every group has specific concerns, including environmental concerns. A stakeholder management mechanism often utilised by organisations in relation to environmental issues is corporate environmental communication, which is the primary focus of this research.

2.5 Corporate Environmental Communication

2.5.1 Overview

Corporate environmental communication involves the communication of environmental issues between a corporation and its stakeholders. As highlighted in Figure 2.2, this process involves not only environmental reporting but also the engagement an organisation has with its stakeholders in relation to environmental issues.

Prior research has focused mainly on environmental reporting, particularly the content of disclosure (see, for example, Roberts, 1992; Patten, 1992; Gray et al., 1995; Deegan & Gordon, 1996; Neu et al., 1998; O’Donovan, 1999, 2002a; Cormier & Gordon, 2001; Campbell et al., 2003). This thesis contends that communication involves not only passive reporting but also involvement by stakeholders in the organisation’s environmental agenda through various feedback mechanisms. Accordingly, the term ‘corporate environmental communication’ is used in this research. The rest of this section discusses the concepts of corporate environmental reporting and stakeholder
engagement in order to highlight the critical role of these approaches in facilitating environmental communication.

![Diagram of the corporate environmental communication process](image)

**Figure 2.2: The corporate environmental communication process**

Corporate environmental reporting (CER) refers to the disclosure of environmental information in both quantitative and qualitative terms through various media. It requires organisations to be accountable for environment issues (Gray et al., 1996; SustainAbility/UNEP, 1996, 1997; Gray & Bebbington, 2001). CER is concerned with highlighting to stakeholders how the company’s activities relate to the environment through:

- its consumption of energy and raw materials
- its business activities and operations

The quantitative disclosure of environmental issues can include monetary and physical aspects (Schaltegger & Burritt, 2000). Monetary information includes financial issues such as financial costs and liabilities related to environmental issues (Gray et al., 1998). Measures of environmental impacts (Schaltegger & Burritt, 2000), such as, for example, the National Pollutant Inventory, can provide physical indicators of environmental performance. Narrative information, such as the organisational context, the company’s
environmental policies, processes and systems to reduce environmental impacts, and procedures undertaken to verify the environmental information, is qualitative information that can also be provided to stakeholders (ACCA, 2001a).

The disclosure of information relating to environmental performance, progress on mandatory and voluntary environmental reporting initiatives, environmental awards, environmental collaborations with various parties and reports on major environmental incidents is potentially useful to stakeholders. Such information enables stakeholders to assess the corporation’s commitment to managing its environmental impacts.

In essence, environmental reporting involves the disclosure of a corporation’s environmental management information to stakeholders. Global guidelines, such as the Global Reporting Initiative (GRI, 2002)\(^\text{17}\), provide extensive guidance to organisations in relation to their disclosure of environmental information to stakeholders. In Australia, public environmental reporting is an initiative that draws upon the GRI to provide Australian Government specific guidance to organisations regarding the disclosure of environmental information to stakeholders (Commonwealth of Australia, 2000, 2003).

Recent literature in social and environmental accounting has emphasised the notion of stakeholder engagement (Gray et al., 1997; Cumming, 2001; Owen et al., 2001). Stakeholder engagement is defined as ‘a process of relationship management that seeks to enhance understanding and alignment between companies and their stakeholders’ (Gable & Shireman, 2005:9). Engagement creates a ‘dynamic context of interaction, mutual respect, dialogue and change, not the one-sided management of stakeholders’ (Andriof & Waddock, 2002:9). In essence, the concepts of ‘trust me’ and ‘show me’ associated with stakeholder management are replaced in the stakeholder engagement process by terms such as ‘involve me’, ‘join me’ or ‘engage me’ (Kaptein & Van Tulder, 2003:209). Corporations are able to develop an understanding of the external social fabric within which they operate through stakeholder engagement (Gable & Shireman, 2005). This research argues that stakeholder management through environmental reporting by companies is accompanied by their engagement with stakeholders. This leads to the development of the concept of corporate environmental communication.

\(^{17}\) The third generation of GRI guidelines (entitled G3) was released in 2006 (GRI website - http://www.globalreporting.org/)
Specific guidelines have been developed to encourage companies to engage with their stakeholders. The Institute of Social and Ethical Accountability, referred to as AccountAbility, has developed a social and ethical accountability framework entitled AA1000 (AccountAbility, 1999). This framework encourages a stakeholder based approach to corporate accountability.

AA1000 encourages companies to engage extensively with stakeholders and include them in corporate decision making processes, a term referred to as “inclusivity”. This framework suggests that the benefit of stakeholder engagement is that:

Stakeholder views are obtained through an engagement process that allows them to be expressed without fear or restriction. (AccountAbility, 1999:7)

The GRI (2002:9) also provides support for engagement to accompany reporting:

A primary goal of reporting is to contribute to an ongoing stakeholder dialogue. Reports alone provide little value if they fail to inform stakeholders or support a dialogue that influences decisions and behaviour of both the reporting organisation and its stakeholders.

Corporations and stakeholders often engage with each other in relation to environmental issues. This can involve private discussions and public meetings (Gao & Zhang, 2001) and even simple feedback approaches, such as stakeholders writing to a company or filling out feedback forms (ACCA, 2001a). Surveys and focus groups can also be initiated by companies to engage with their stakeholders (Gao & Zhang, 2001). Web based features can also be utilised to engage stakeholders (Unerman & Bennett, 2004).

A number of theoretical perspectives have been developed to provide an understanding of environmental communication. These have primarily focused on environmental reporting and have certain limitations. They are discussed in the remainder of this chapter.

2.5.2 Theoretical perspectives for environmental communication

2.5.2.1 Overview

Theoretical arguments for environmental communication are based on existing theories of social and environmental accounting and emphasise corporate environmental
reporting. They can be classified as managerialist, critical and middle-of-the-road perspectives (Gray & Collison, 2002).

The managerialist school of thought is based on neoclassical economics. Positive accounting theory and agency theory (economic theories) and capital market (decision usefulness) theories are prominent in this approach (Gray et al., 1995). Managerialist literature perceives environmental communication as a tool for enhancing shareholder value (Gray & Collison, 2002).

Critical theory arguments are grounded in a political economy perspective (Gray et al., 1995, 1996). When viewed in a political economy context, social and environmental accounting serves as a tool for constructing, sustaining and legitimising economic and political arrangements, institutions and ideological themes that contribute to the corporation’s private interests (Cooper & Sherer, 1984). The critical theory paradigm for social and environmental accounting is primarily based on Marxist (Tinker, 1985; Tinker et al., 1991) and Habermasian perspectives (Puhty, 1986, 1991). Parker (2005) also identifies eco-feminism (Cooper, 1992; Andrew, 2000), deep green ecology (Maunders & Burritt, 1991; Gray, 1992; Andrew, 2000) and the work of Lehman, which draws upon Rawls’s theory of justice (Lehman, 1995, 1999, 2001), as critical perspectives for social and environmental accounting.

The middle-of-the-road approach lies between the managerialist and critical perspectives and suggests that while businesses have contributed to environmental problems, they have a responsibility to resolve these issues (Gray & Collison, 2002). This approach has been widely used to study current environmental communication practices through the lens of stakeholder and legitimacy theory (Deegan, 2002).

The middle-of-the-road approach has been extensively researched because its emphasis is on engaging companies in sustainable business operations rather than merely focusing on shareholder value (managerialist approach) or questioning the existence and dominance of corporations (critical perspective). While managerialist and critical theories provide valid explanations for environmental communication in different contexts, the focus of this thesis is corporations that rely on the support of their

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18 Parker (2005) combines the managerialist and middle-of-the-road perspectives and classifies these as augmentation theories. Critical theories are referred to as heartland theories.
stakeholders for survival. Consequently, middle-of-the-road insights inform this study. Stakeholder and legitimacy theory, which rely on the middle-of-the-road perspective, are discussed next.

**2.5.2.2 Stakeholder Theory**

Stakeholder theory has been utilised in social and environmental accounting research. In particular, Ullmann’s stakeholder model has been applied to studies of environmental disclosure. Ullmann (1985) developed a three-dimensional strategic stakeholder model to explain social disclosure and performance. The components of the model are stakeholder power, strategic posture and past and current economic performance.

Stakeholder power refers to the ability of stakeholders to influence an organisation. Strategic posture refers to the mode of response of key decision makers within the organisation to social and environmental issues. Past and current economic performance also affects the extent to which decision makers attend to social and environmental issues and the ability of the company to disclose social and environmental information to stakeholders.

Ullmann (1985:553) states that ‘social performance and disclosure are a means to manage dependence relationships’ and that ‘depending on the configuration of the three dimensions, a firm will use either social performance or social disclosure or both techniques simultaneously to manage its relationship with its stakeholders’. His arguments support the premise that reporting is only one approach through which stakeholder relationships are managed; actual performance is also critical. Environmental reporting needs to be matched with environmental performance if corporations are to be held accountable for their environmental impacts (SustainAbility/UNEP, 1996).

Ullmann’s theoretical framework explains the extent to which companies will disclose social and environmental information as a strategy to manage stakeholder relationships. The framework can also be applied to environmental communication. It highlights that, in addition to stakeholder characteristics (stakeholder power), the impact of strategic posture and economic performance on the management of stakeholder relationships influences the environmental communication practice of a company.
2.5.2.3 Legitimacy Theory

Legitimacy theory suggests that organisations will undertake activities to manage their environmental performance in order to legitimise their continued existence to society (Lindblom, 1993). The theory is centred on the notion of organisational legitimacy, which is a ‘condition or status which exists when an entity’s value system is congruent with the value system of the larger social system of which the entity is a part’ (Lindblom, 1993:2). Whenever a disparity exists between the two value systems, there is a threat to the entity’s legitimacy (Dowling & Pfeffer, 1975). This is commonly referred to as a legitimacy gap (Sethi, 1978; Lindblom, 1993). Therefore, legitimacy theory posits that in order to survive, organisations need to manage societal expectations and legitimacy gaps. This process is called legitimisation (Dowling & Pfeffer, 1975; Lindblom, 1993).

The degree of legitimacy will vary among organisations (Dowling & Pfeffer, 1975; Oliver, 1991; Lindblom, 1993). Organisations that are more visible to their external constituents and that rely extensively on social and political support will require a greater level of legitimacy (Dowling & Pfeffer, 1975; Lindblom, 1993). Specifically, in the environmental context, environmentally sensitive industries will need to impart a greater level of legitimacy to their stakeholders than companies operating in industries that have stable environmental conditions (Wilmshurst & Frost, 2000; Savage et al., 2002; Campbell, 2003, 2004).

Legitimacy is a dynamic concept (Lindblom, 1993; Nasi et al., 1997). There can be changes in corporate performance and/or societal expectations (Sethi, 1978; Wartick & Mahon, 1994) leading to potential legitimacy gaps (Sethi, 1978; Lindblom, 1993). Thus, management needs to be aware of current societal expectations as well as possible legitimacy gaps and to manage them by undertaking activities that legitimise its corporate existence to stakeholders.

Particular events can be instrumental in creating legitimacy gaps (Patten, 1992; Elsbach, 1994; Deegan & Rankin, 1996; Deegan et al., 2000). Organisations need to respond by identifying the key stakeholders that can make a difference to their legitimacy and undertaking strategies to reduce this gap (Dowling & Pfeffer, 1975; Lindblom, 1993; O’Donovan, 1999, 2002a, 2002b). For example, an environmental incident in a sensitive
industry such the petroleum industry can create a legitimacy gap for a particular company that requires it to address this threat. Other companies operating in the same industry can also be under increasing pressure from their stakeholders and need to legitimise their existence to them (Patten, 1992).

The ‘illegitimacy’ of an organisation can lead to economic, legal and social sanctions (Dowling & Pfeffer, 1975; Lindblom, 1993). Economic sanctions can include a boycott of output, strike of operation or refusal to extend credit. Legal sanctions can include fines or lawsuits. Social sanctions can include information picketing, publicity campaigning and a refusal to work for the organisation (Lindblom, 1993).

One way to facilitate organisational legitimation is the communication of environmental activities to stakeholders (Dowling & Pfeffer, 1975; Lindblom, 1993; Elsbach, 1994; Suchman, 1995; Deegan, 2002; O’Donovan, 2002a, 2002b). Accordingly, the basic tenets of legitimacy theory suggest that corporate environmental communication is a mechanism that organisations can undertake in order to legitimise their existence to their external stakeholders.

2.5.3 Developments in theoretical perspectives

The theoretical perspectives discussed so far have an external focus. In a recent paper, Adams (2002) posited that existing theories of social and environmental reporting need to be extended to consider the impact of the internal organisational context on social and environmental reporting. She highlighted that prior research has focused primarily on corporate characteristics such as size and industry as well as general contextual factors developed on the basis of the theoretical perspectives discussed earlier. The author suggests that a combination of corporate characteristics, general contextual factors and internal contextual issues are critical factors that affect social and environmental reporting. Her paper identifies internal organisational factors that can affect social and environmental reporting, and these can also be related to environmental communication.

Corporate attitudes to reporting and reporting processes are regarded as critical internal contextual factors. The extent to which a company undertakes environmental communication therefore depends on the importance placed on these issues by key decision makers. Corporate culture is critical to a company’s communication processes.
These attitudes transform into specific internal processes that are implemented within the organisation to enable the communication of environmental issues. Internal processes can include specific committees to deal with environmental issues, specific structures and governance procedures and the possible involvement of stakeholders.

2.5.4 Prior research into environmental communication

A number of studies have utilised the theoretical perspectives discussed so far. This section provides an analysis of the key findings from the literature rather than a descriptive overview of all the studies that have utilised these theories.

There is an extensive focus on environmental reporting in the literature on environmental communication. These studies have primarily utilised stakeholder and legitimacy theory.

The use of stakeholder theory to explain environmental disclosure is limited when compared with the extensive use of legitimacy theory. Roberts (1992) empirically tested Ullmann’s (1985) stakeholder framework and found that the measures of stakeholder power, strategic posture and economic performance were significantly related to levels of corporate social responsibility disclosure in the US. Christopher et al. (1998) replicated this study in relation to Australian mining companies and only found support for the stakeholder power dimension. More specifically, only large companies and those with membership of the Australian Mining Industry Council19 had a range of stakeholder influences and tended to have a higher level of environmental disclosure.

Neu et al. (1998) indicate that environmental disclosure in Canadian organisations is influenced by stakeholders, described as the ‘relevant publics’, who can exert influence over companies. The authors also highlight that disclosure is a means of legitimising corporate existence. Thus, their study supports the premises of the stakeholder and legitimacy theories.

Many researchers have utilised legitimacy theory, and most studies have focused on environmental reporting in North America, Europe and Australia. Early studies linking social disclosure to legitimacy theory, such as those by Hogner (1982) and Guthrie and

19 Now called the Minerals Council of Australia.
Parker (1989)\textsuperscript{20}, have been followed by more recent studies focusing mainly on environmental reporting. Some of the key themes emerging from the legitimacy theory literature are discussed here.

Size (Gray et al., 1995; Deegan & Gordon, 1996; Adams et al., 1998; Cormier & Gordon, 2001) and industry (Gray et al., 1995; Deegan & Gordon, 1996; Adams et al., 1998; Campbell, 2003,2004) have been found to be positively associated with environmental disclosure. Large and environmentally sensitive companies are more likely to need to legitimise their existence to stakeholders through environmental disclosure, largely due their highly visible environmental impacts.

Country specific factors seem to differ in relation to the application of legitimacy theory. For instance, legitimacy theory has been utilised to explain the reluctance of Irish companies to disclose environmental information (O’Dwyer, 2001, 2002). On the other hand, most Australian (Deegan & Gordon, 1996; Deegan & Rankin, 1996; O’Donovan, 1999, 2002b; Deegan et al., 2000, 2002; Wilmshurst & Frost, 2000; Frost & Seamer, 2002), North American (Patten, 1991, 1992; Buhr, 1998; Cormier & Gordon, 2001; Savage et al., 2002; Milne & Patten, 2002) and UK studies (Gray et al., 1995; Adams et al., 1998; Campbell, 2003, 2004; Moerman & Van Der Laan, 2005) on environmental disclosure have associated increasing trends in environmental disclosure with the basic premises of legitimacy theory. In the case of Australia, the various local environmental initiatives identified in section 2.3 could provide an impetus for corporations to disclose environmental information extensively to their stakeholders (Burritt, 2002a, 2002b; Richard & Frieman, 2004).

Brown and Deegan (1998) as well as Deegan et al. (2002) have associated legitimacy with media agenda setting theory. This suggests that media reports play a role in shaping an organisation’s environmental disclosure policy for legitimacy purposes. O’Donovan’s (1999) study also supports this proposition. It found that companies will increase their environmental disclosure in annual reports to defend negative environmental activities or to justify situations brought to prominence by the media with the hope of shaping public opinion.

\textsuperscript{20} Guthrie and Parker (1989) found limited support for legitimacy theory for environmental disclosure only. See also Deegan et al. (2002).
Particular incidents are likely to trigger an increase in environmental reporting. This view is supported by Patten (1992) in relation to the *Exxon Valdez* disaster; Deegan and Rankin (1996) in relation to environmental prosecutions of Australian companies; Jantadej’s and Kent’s (1999) study of the disclosure of the Australian mining company, BHP, after the widely publicised Ok Tedi incident in Papua New Guinea; and Deegan et al. (2000) in relation to major social and environmental incidents in Australia. It should be noted that none of these studies refer to the time lag resulting from corporate environmental reporting on an annual basis, which could potentially reduce the effectiveness of corporate attempts to seek legitimacy over the incident.

O’Donovan (2002a) and Yongvanich and Guthrie (2004) have expanded the empirical literature on legitimacy theory by relating the Ashforth and Gibbs (1990) and Suchman (1995) classifications of the various motives for legitimacy to environmental disclosure. The Yongvanich and Guthrie (2004) study focused on the Australian minerals industry. These studies provide support for the premise that the various legitimacy motives and strategies are associated with environmental disclosure.

Campbell (2000) and Campbell et al. (2003) have demonstrated that legitimacy theory may not always provide a sufficient explanation for social and environmental reporting. Campbell (2000) analysed the social and environmental disclosure of Marks and Spencer on a longitudinal basis and found that changes in the company chairman could also explain fluctuations in the extent of disclosure by the company at two of the three changeover points. The Campbell et al. (2003) study of UK environmental disclosure suggests that legitimacy theory provides an explanation of disclosure in some cases but not in others. The authors contend that these mixed results could be attributed to the distorting effects of perception and the increase in the choice of disclosure media.

The social and environmental accounting literature on stakeholder engagement is limited relative to the extensive number of social and environmental disclosure studies. The literature can be subdivided into examples of current practices of engagement with stakeholders (Gray et al., 1997; Cumming, 2001) and direct criticisms of engagement practice (Owen et al., 2001).

Gray et al. (1997) provide an in-depth analysis of the engagement processes at Traidcraft Ltd in the UK. They highlight that the company’s practice of involving
stakeholders in the social and environmental agenda provides useful insights into the stakeholder engagement process. Cumming (2001) conducted interviews with environmental managers to explain stakeholder engagement practices in UK corporations. Conversely, Owen et al. (2001), in a series of short interviews with corporate managers, representatives of the then ‘big five’ accounting firms, consultants and NGOs in the UK, have questioned the role of stakeholder engagement. They suggest that corporations are able to capture engagement processes largely due to the power asymmetry between an organisation and its stakeholders.

The overview of environmental communication studies presented here reveals several gaps in the literature. Studies have primarily focused on environmental reporting. As discussed in section 2.5.1, disclosure is merely a strategy that a company utilises to manage stakeholder relationships, and this process is passive. There is often engagement between a corporation and its stakeholders, but this issue has had limited coverage in the literature. Thus, there is an increasing need for literature that examines the entire environmental communication process—engagement with stakeholders as well as environmental reporting.

Both stakeholder and legitimacy theory have been widely utilised and are now accepted theoretical positions for environmental reporting (Deegan, 2002). However, with the exception of the work of Adams (2002), as discussed in section 2.5.3, Campbell (2000) and Campbell et al. (2003), there has been limited theoretical development of environmental communication in relation to factors other than legitimacy relationships with stakeholders.

Most studies that utilise stakeholder and legitimacy theory to explain environmental reporting have focused mainly on analysing annual reports or other print media. They have not examined in depth the role of the medium in enabling environmental communication. The literature discussed here indicates that the explanatory power of current theories of environmental communication is limited, particularly with regard to the medium of communication (Campbell et al., 2003). The next chapter demonstrates that the existing theorisation for environmental communication considered in this chapter can be expanded to account for the use of a particular medium for communicating environmental issues.
2.6 Summary

This chapter has discussed the critical importance of environmental issues to corporations and stakeholders. It suggests that while corporations contribute towards environmental issues, they need to manage these issues as well as the concerns of their stakeholders. Environmental communication therefore plays a critical role in a corporation’s environmental agenda. This process is taken to include environmental reporting as well as engagement with stakeholders.

An overview of prior environmental communication studies indicates that the literature has primarily focused on environmental reporting through print media, especially annual reports, and has provided limited theoretical understanding of the environmental communication process beyond stakeholder and legitimacy theory. It must also be considered that the medium can have an impact on environmental communication. These issues inform the current study and are considered in detail in the next chapter.
Chapter Three: Corporate Environmental Communication Media

3.1 Introduction

The previous chapter demonstrated that the impact of the medium on environmental communication has had limited emphasis in the literature. This chapter focuses on the medium for environmental communication. Section 3.2 utilises the McLuhan (1964) adage of ‘the medium is the message’ to explore the importance of the medium in communication.

The evolution of the various media for communicating environmental issues to stakeholders is discussed in section 3.3. The focus is on the use of annual reports, environmental reports, advertisements, brochures, newsletters, media releases and the web for environmental communication. It is argued that, over time, acknowledgement of the critical nature of environmental issues and increasing stakeholder pressures has led to the need for extension in the environmental communication process. This extension can be facilitated through developments in the medium for environmental communication.

In section 3.4, media richness theory (Daft & Lengel, 1984, 1986; Sproull, 1991; Valacich et al., 1993) is used to develop a Media Richness Framework. The use of the Media Richness Framework to compare the various environmental communication media indicates that the web is a ‘rich medium’ which extends the capabilities of traditional media.

A review of the web based environmental communication literature is initially provided in section 3.5. This is followed by the application of the Media Richness Framework to the existing literature in order to identify the extent to which Media Richness Framework characteristics have been addressed in prior studies. Section 3.5 also identifies the gaps in the literature. It highlights that current studies lack a framework that can be used to assess the extent of web usage for environmental communication. Moreover, a majority of these studies have not addressed the factors that influence the
extent to which the web is utilised by corporations to communicate environmental issues to their stakeholders.

3.2 The Medium is the Message

In a culture like ours, long accustomed to splitting and dividing all things as a means of control, it is sometimes a bit of a shock to be reminded that, in operational and practical fact, the medium is the message. This is merely to say that the personal and social consequences of any medium – that is, any extension of ourselves – results from the new scale that is introduced in our affairs by each extension of ourselves, or by any new technology. (McLuhan, 1964:7)

Marshall McLuhan’s seminal work on the medium and its message can be applied to environmental communication. This section summarises his insights before utilising them to establish the critical importance of the medium in environmental communication.

McLuhan (1964) defines the medium broadly as ‘any extensions of ourselves’ (p. 7) and message as ‘the change of scale or pace or pattern’ (p. 8). For instance, a hammer extends our arm, and transportation extends our arms and legs, enabling us to travel vast distances. Quite often, new media extend the capabilities of the older media.

McLuhan (1964) does not imply that content is irrelevant but states that the impact of the use of a medium is critical because it changes personal and social dynamics; termed ‘the message’. The message is the outcome for society of the use of a medium. Using the transportation analogy, modern transport has changed society and provided numerous benefits to mankind. Moreover, extension does not imply replacement; it merely highlights that technological developments evolve over time. For instance, people will still continue to walk manageable distances. However, they also have a choice of transportation available to them to travel small and vast distances.

McLuhan’s logic also implies that we must consider the effects of the introduction of a new medium carefully (Levinson, 1999; Federman, 2004). The message of a medium can have both beneficial and detrimental impacts on society. Therefore, by being aware of its impact, we can control its limitations.
Levinson (1999) highlights that McLuhan’s ideas have been supported in the ‘digital age’. Technology has had a tremendous impact on society. The Internet has converted the Earth into a ‘global village’; another adage associated with McLuhan (see McLuhan & Fiore, 1968). An application of McLuhan’s principles indicates that the message of technological developments is the transformation of society. Modern technology has provided numerous benefits to mankind but at the same time has created certain problems.

The message of the medium in relation to environmental communication is the focus of this research. This chapter seeks to establish the impact of the increasing importance of environmental issues and stakeholders on the medium of environmental communication. It is argued that new media extend the capabilities of the traditional media by enabling corporations to respond to stakeholder needs regarding the communication of environmental issues.

3.3 Environmental Communication Media

The annual report was the earliest medium to be extensively utilised by corporations to communicate environmental issues (Ernst & Ernst, 1976; Ingram & Frazier, 1980; Trotman & Bradley, 1981; Guthrie & Mathews, 1985; Guthrie & Parker, 1990; Gray et al., 1995). An annual report is often regarded as the primary corporate communication tool for providing information to those interested in the affairs of a company. It is commonly referred to as a general purpose financial report because it provides information in a generalised format for all financial users. The annual report consists of the chairman’s statement and directors’ report and financial statements, including the income statement, balance sheet, statement of cash flows, notes to accounts and other narratives.

Environmental information is often provided as narrative disclosure in annual reports, mainly in the chairman’s or directors’ statement, in notes to accounts or as a separate narrative. For instance, as mentioned in section 2.3, in Australia, companies are required to disclose details of their compliance with relevant environmental legislation in corporate annual reports. However, financial statements do not tend to focus extensively on environmental information (Gray et al., 1998).
The emergence of annual reports as a communication medium for environmental issues parallels the development of environmental awareness discussed in the last chapter. Stakeholders became increasingly knowledgeable about the impact of corporate activities on the environment after the emergence of the environmentalism movement. Thus, corporations had to respond to stakeholders’ information needs. The mechanism used to provide corporate information—the annual report—also became a vehicle for disseminating environmental information. An annual report is therefore appropriate for the communication of environmental issues to those stakeholders concerned about a corporation’s economic performance, such as shareholders and lenders. The emphasis on sustainable development from 1987 onwards popularised environmental disclosure. The literature indicates that many companies started to communicate environmental issues in the corporate annual report at this time (see, for instance, Patten, 1991; Roberts, 1992; Gray et al., 1995).

Environmental reports emerged in the mid-1990s as the corporate response to an increasing emphasis on environmental issues by numerous stakeholders (ACCA, 2001a). An environmental report is a document that communicates a corporation’s environmental management activities. It often provides information on an organisation’s profile, environmental policy statement, target and achievements, performance and compliance, management systems and procedures and an independent verification statement (ACCA, 2001a, p. 10-11). The Association of Chartered Certified Accountants (ACCA) and the Canadian Institute of Chartered Accountants (CICA) have played a fundamental role in the development of environmental reports, prompting other institutions and organisations to encourage corporations to develop such reports in their respective nations (SustainAbility/UNEP, 1996). Over time, environmental reports have been subsumed into social and environmental reports or sustainability reports. More recently, there has been an increasing shift towards triple bottom line (social, environmental and economic) issues (ACCA, 2001a).21

As mentioned in section 2.2, environmental issues came to prominence in the 1990s as a result of global environmental developments such as the Earth Summits and the Kyoto Protocol. Section 2.3 highlighted that corporations were also involved in major environmental initiatives, internationally through initiatives such as the CERES

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21 Milne and Gray (2002, 2004) argue that sustainability reports are much broader and that companies are producing triple bottom line reports. As such, the term ‘social and environmental reports’ is used throughout this thesis.
Principles and the UN Global Compact, and locally through initiatives such as the National Pollutant Inventory and Greenhouse Challenge. All these developments have led to greater environmental information being produced and increasing pressures from a range of stakeholders (as discussed in section 2.4) for improvements in corporate environmental performance. Thus, corporate environmental communication (discussed in section 2.5) became increasingly critical, resulting in the development of guidelines such as the Global Reporting Initiative (GRI) and AA1000.

Corporations recognised that their accountability in relation to environmental issues extended to both financial and non-financial stakeholders (SustainAbility/UNEP, 1996). Stakeholders such as non-governmental organisations (NGOs), the media, local communities and even the general public accompanied the financial stakeholders with environmental interests. Regulatory bodies also became increasingly active in monitoring corporate environmental impacts. Thus, social and environmental reports emerged as a means of satisfying the broader stakeholder demand for specific environmental information.

Timeliness is a critical issue for modern environmental communication. The critical nature of environmental issues and the range of stakeholders affected by corporations’ environmental performance highlights that periodic communication needs to be complemented by timely mechanisms. Advertisements, brochures, newsletters and media releases often complement the communication of environmental issues through periodic reports such as annual reports, and social and environmental reports (Zeghal & Ahmed, 1990; Brown & Deegan, 1998; Tilt, 2001; Deegan et al., 2002). These mechanisms attempt to overcome the barriers to periodic communication by providing specific information to stakeholders on an ad hoc basis.

The use of advertisements and brochures for environmental communication (Zeghal & Ahmed, 1990) follows corporate communication approaches to marketing. The emphasis is on the importance of environmental issues to the corporation. Advertisements of environmental issues can be relayed via eco labelling, flyers and banners, newspaper notices and even office stationery. Brochures can also be prepared for specific environmental issues.
Company newsletters and magazines can also be used to communicate environmental information (Tilt, 2001). These are usually targeted at particular stakeholder groups, such as employees or the local community, to inform them of current trends in environmental management.

Companies can use media releases to communicate environmental information (Brown & Deegan, 1998, Deegan et al., 2002). These provide specific information on environmental developments, such as, for instance, investments in environmental technology, voluntary environmental initiatives and environmental collaborations. Conversely, companies can use this medium for responding to criticisms about their environmental performance or to report environmental incidents.

More recently, the web has been used for environmental communication (Adams & Frost, 2004). The World Wide Web (web) is the most popular and commonly used tool on the Internet. It is based on the hypertext transfer protocol (HTTP), which allows the display of webpages containing text, graphics and animation through the hypertext markup language (HTML). Given the popularity of the ‘web’, the term is used interchangeably with the Internet.

The web should be distinguished from intranets and extranets. An intranet is a facility which provides web based features for a local area where access is available only to its members. An example is a local organisation, where access to the website is available to members of the organisation. On the other hand, an extranet is a series of intranets where members have a certain level or full access to each other’s intranet. An example of an extranet is an organisation that has combined its intranet with that of its suppliers22.

As initially highlighted in Jones et al. (1998), SustainAbility/UNEP (1999, 2001), ACCA (2001b), and Isenmann and Lenz (2001, 2002), the web has technological benefits that have the potential to enhance the communication of environmental issues between a corporation and its stakeholders. These studies indicate that, over time, there

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22 The emphasis in this thesis is solely on the web and its usage for corporate environmental communication to stakeholders. It does not examine the use of intranets and extranets by companies and those stakeholders with which it has an established relationship.
has been an increase in the adoption of the web by companies for environmental communication.

The literature discussed in this section suggests that environmental communication has evolved from the initial use of annual reports to encompass social and environmental reports, advertisements, brochures, newsletters and media releases. The web is also increasingly being used. These developments in communication media have been influenced by the critical importance of environmental and stakeholder issues. Despite this, the potential offered by the various communication media remains largely unexplored. An examination of its use can highlight how the ‘new’ media for environmental communication can extend the capabilities of the traditional media and, therefore, enhance the environmental communication process.

Steinfield and Fulk (1990:13–14) point out that research into communication in organisations is data rich but theory poor. Thus, a need arises for a theoretical understanding of the use of the medium for environmental communication because:

…the overall consequences of theory-driven research efforts is a more coherent and defensible set of conclusions on which to base knowledge claims.

The Media Richness Framework described in the following section will provide a basis for assessing the capabilities offered by the various environmental communication media.

3.4 Media Richness Framework

3.4.1 Media Richness Theory

Daft and Lengel (1984, 1986) originally proposed the concept of media richness. Media richness refers to the ability of the medium to improve human understanding by reducing ambiguity; a concept referred to as equivocality. Accordingly, a ‘rich’ medium will be suitable for communication tasks with high equivocality because it has the ability to effectively communicate the underlying message. Conversely, a ‘lean’ medium can be used for communication tasks with lower equivocality because such tasks are routine and structured. As Daft and Lengel (1984:194–195) posit:

23 Also referred to as information richness in some instances.
organisational success is based on the organisation’s ability to process information of appropriate richness to reduce uncertainty and clarify ambiguity.

Daft et al. (1987) apply the principles of media richness to information systems and identify four critical attributes for assessing the richness of a medium:

- immediacy
- multiple cues
- language variety
- personal source.

Immediacy refers to the ability of the medium to provide timely feedback. This criterion is essential for the communication process because time lags can lead to critical issues not being adequately addressed. For instance, vital information related to a particular environmental incident will not be useful if there are delays in communicating to affected stakeholders. Stakeholders such as the local community may not even be aware of the incident and, therefore, will be unable to undertake action to overcome the incident’s impact on their welfare. Immediacy enables timely communication so that critical decisions can be effectively made.

Multiple cues imply the ability to convey messages through different cues, such as body language, voice, tone, words, numbers and graphic symbols. As the common adage ‘a picture is worth a thousand words’ implies, restricting communication to merely written documentation is not always desirable. Providing a range of cues when transmitting a particular message can improve communication and enhance the intended audience’s understanding. For instance, the presentation of written and numerical information on environmental impacts can be enhanced by the inclusion of diagrams.

Language variety developed from the earlier work of Daft and Wington (1979) and refers to the various ways of transmitting ideas and concepts through language symbols in order to improve understanding. The original Language Variety theory suggested that certain modes of communication, such as painting and music, had the ability to convey a broader range of meaning through symbols than written messages, such as those involving mathematical notions. Daft and Lengel (1984) apply this concept to managerial behaviour and suggest that natural language has the ability to provide greater language variety than written documentation.
Initial theories of media richness emphasised language as a key mode for improving understanding. However, the basic premise of language variety is that communication should be assisted by tools that can enhance understanding. Thus, a range of mechanisms can be used to organise information that will improve the understanding and interpretation of the critical issue to be communicated. For example, a large document about environmental issues can be divided into several sections and subsections in order to improve its readability.

Personal source refers to the ability to convey feelings and emotions. Human behaviour is typified by emotions. Therefore, a personal source is essential in order to get the message across to end users. Personal feelings and emotions are an integral part of the communication process and messages need to be tailored to the user’s frame of reference. For example, environmental information may have various subheadings representing information pertinent to each stakeholder group. In this case, stakeholders can experience a personal source by being able to retrieve information related to their individual needs.

According to media richness theory, for highly equivocal communication tasks, face-to-face communication is characterised as a rich medium. This is followed by telephones and modern information and communication technology, such as emails. Written communication is classified as the leanest medium (Daft & Lengel, 1984, 1986; Daft et al., 1987; Trevino et al., 1990b). Rich media, such as face-to-face communication, provide instantaneous responses and a personal source for the communication. Such media also enable multiple cues and language variety to be made available for the communication process. Modern information and communication technologies were not adequately developed at the time media richness theory originated. As such, they were not considered as rich media. Leaner media, such as written documents, do not enable immediate responses, have limited cues and language variety for providing information and are an impersonal communication source.

Studies on media richness have produced conflicting results. Whilst initial studies, such as Daft et al. (1987), Trevino et al. (1987,1990b), Lengel and Daft (1988) and Russ et al., (1990), found support for the concept of media richness, highlighting that a rich medium is utilised for highly equivocal tasks within an organisation, latter studies
(Markus, 1994; D’Ambra et al., 1998; Dennis & Kinney, 1998) did not provide support for this theory.

A primary reason for the lack of support for media richness theory in more recent studies is the increasing use of modern information and communication technologies by organisations. Computer mediated communication (Rice, 1987; Thurlow et al., 2004) has risen to prominence since the Daft and Lengel (1984,1986) conceptualisation of media use. Consequently, the original media richness criteria need to be reassessed in relation to the capabilities provided by modern information and communication technologies.

Modern information and communication technologies such as the Internet have the potential to provide immediacy in the communication process. Moreover, they provide multiple cues and language variety to enhance communication. For instance, the Internet uses audio and visual forms to relay information. Modern information and communication technologies also have customisation features that allow communication to be personalised. Thus, such technologies can be conceptualised as a rich medium for communication.

Media richness characteristics can be expanded to take into account the changing forms of organisational activity and the use of modern information and communication technologies, which are not merely restricted to handling ambiguous tasks. Such an expansion can provide a broader and comprehensive framework for assessing the potential of a medium for communication purposes.

3.4.2 Extensions to Media Richness Theory

More recent literature has developed additional attributes for media richness to take into account the capabilities offered by modern information and communication technologies. Sproull (1991) identifies specific criteria which differentiate the medium of email from other communication media. Three of these criteria—multiple addressability, externally recordable and computer processable memory—are applicable to modern information and communication technologies because they conceptualise

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24 Sproull (1991) also mentions that asynchronous and faster communication and text based content differentiates email from other communication media. However, more recent advances in information and
the benefits of computer mediated communication (Markus, 1994). Valacich et al. (1993) also identify an additional characteristic for media richness called Concurrency, which they suggest is another difference between traditional media and computer mediated communication. According to these authors, computer mediated communication encourages the sharing of information and group collaboration through concurrent interaction.

Multiple addressability refers to the ability to communicate information to multiple users simultaneously. It therefore focuses on the mass communication capability of a medium (McQuail, 2000). One of the critical benefits of computer mediated communication is its ability to target a range of users. The original criteria for media richness do not consider that effective communication also requires accessibility to a critical mass of users (Markus, 1994). For instance, a simple email can be used to get a message across to multiple users in different areas, something which is not possible with traditional forms of communication.

The externally recordable criterion relates to the ability of the medium to provide a record of the communication. Computer mediated communication has the benefit of providing current and past records of the communication process due to its data storage and retrieval capabilities. Archived information, for instance, can be stored electronically and made available easily.

Computer processable memory refers to the organisation and manageability of information so that searches and the analysis of specific information can be undertaken. Electronic searches can simplify a complicated task within a short time. Similarly, information can be analysed electronically for trends and patterns. Thus, electronic search and analysis facilities can provide useful information to end users.

The final criterion, concurrency, relates to the ability of the medium to facilitate interaction with multiple users simultaneously. Concurrency allows group tasks to be undertaken within an organisation. For instance, Valacich et al. (1993) point out that group decision support systems are a form of computer mediated communication which communication technology have enabled communication to be synchronous and to move beyond text based content. Moreover, speed can be related to the immediacy criterion.
enables users to interact with each other immediately and to work towards a common task. Feedback can also be received through such interaction.

3.4.3 Media Richness Framework and environmental communication

The Media Richness Framework proposed for this study consists of the original criteria identified by Daft et al. (1987) as well as the extensions which take into account the potential of modern information and communication technologies (Sproull, 1991; Valacich et al., 1993). This framework is a critical component of the research model for this study, which is discussed in the next chapter.

The Media Richness framework is utilised in this section to assess the potential of the various media for communicating environmental issues to stakeholders. A comparison of the richness of the various media provides the means to identify the extent to which the new media extends the capabilities of the traditional media.

3.4.3.1 Immediacy

The immediacy (Daft et al., 1987) criterion varies across the various environmental communication media. Annual reports and social and environmental reports are periodic; advertisements, brochures, newsletters and media releases are ad hoc; the web has the potential to enable communication on a regular basis.

Much of the information provided in annual reports is restricted to past data because of the periodic focus on financial measurement (Chambers, 1966). Until recently, the periodic communication of environmental issues has been considered sufficient for disseminating environmental information because corporate information such as financial issues has also been disclosed on an annual basis. Thus, environmental communication has been closely aligned with corporate communication processes in the annual report, leading to its periodic disclosure. Companies now also produce interim financial reports, and it is possible for environmental issues to be communicated through such mechanisms if these are considered significant to the corporation.

Social and environmental reports are also produced on a periodic basis so that all forms of corporate communication are consistent (ACCA, 2001a). Ad hoc mechanisms for
environmental communication have varying degrees of timeliness. Media releases and newsletters are likely to be timelier than advertisements and brochures.

Web based environmental communication enables immediacy. The web can provide timely information to stakeholders. It allows an ongoing process of environmental communication rather than merely periodic communication. Companies that undertake specific activities in addition to their routine environmental management activities or those involved in certain environmental incidents can use the communication potential of the web to legitimise their existence to stakeholders. For example, webcasts can be undertaken to provide critical environmental information to numerous stakeholders in a timely manner.

3.4.3.2 Multiple Cues

The multiple cues (Daft et al., 1987) associated with print based media are limited. However, the web has electronic capabilities that provide a range of tools for information dissemination.

The research literature suggests that the use of annual reports for environmental disclosure emerged in the 1970s (Ernst & Ernst, 1976; Trotman & Bradley, 1981). Environmental communication occurred through annual reports, which have limited cues, because of the lack of development of information and communication technology tools at that time. The presentation features of social and environmental reports are similar to those of annual reports. These features are limited in hardcopy form so the attributes associated with multiple cues have restricted use. Similarly, advertisements, brochures, newsletters and media releases in hardcopy form have limited presentation cues for information dissemination.

Conversely, the web has presentation flexibility and visibility benefits, and these tools can be utilised to present information to stakeholders. Environmental information can be depicted clearly through visual tools such as graphics and animation. Moreover, audio and video options can be accessed through the web. Thus, the web has the potential to change the way information is presented for environmental communication.
3.4.3.3 Language Variety

Language variety (Daft et al., 1987) associated with print based media is also limited in enhancing the organisation of information. However, the web has a variety of tools that can assist in the organisation of information.

The annual report is a general purpose report. As such, it offers limited ways of organising environmental information. Social and environmental reports, which have a similar format, suffer from the same limitation. Advertisements, brochures, newsletters and media releases, which are available in hardcopy form, are also limited in their ability to organise environmental information.

Web based environmental communication also enables language variety. Specific features of the web can improve the understandability of information. Hyperlinks, menus and other web based tools can assist in the organisation of environmental information. The information to be disclosed is not limited to a specific number of pages, and both general and specific information can be made available. Environmental information can be disclosed in different formats to provide a variety of ways in which to organise such information. A specific web portal can be dedicated to environmental issues. Information can also be integrated through hyperlinks to other sections, pages or websites. For example, environmental information can be linked to financial information through a click of the mouse. Hence, the web has potential to enhance the way environmental information is organised for communication purposes.

3.4.3.4 Personal Source

There are differences in the personal source (Daft et al., 1987) capability offered by annual reports, social and environmental reports, ad hoc mechanisms and the web. These media provide varying degrees of personalisation to stakeholders.

Annual reports are primarily targeted to those interested in the financial position of the corporation. These stakeholders thereby regard such reports as a form of personalised information. Corporate responses to environmental issues, at the time annual reports

25 A web portal provides access to an entire website that can be used to store specific information rather than merely providing a link to another webpage or section.
emerged as an environmental communication medium, were mainly concerned with the financial impact of environmental issues. This is evident from literature produced by Ernst and Ernst (1976), Ingram and Frazier (1980) and Trotman and Bradley (1981). Thus, at that time, the annual report was perceived as a useful medium for the corporate communication of environmental issues to financial stakeholders.

Conversely, as social and environmental reports are entirely focused on environmental issues, stakeholders with specific environmental interests may consider them a personalised form of communication. Thus, these reports can serve a broad range of stakeholders (ACCA, 2001a).

Mechanisms such as newsletters can provide a more personalised source of information to selected stakeholders—for example, employees and the local community—than other generalised, ad hoc mechanisms. Media releases often target a massive audience. Therefore, information is not personalised to the needs of stakeholders with environmental interests. Advertisements and brochures usually serve a general audience.

Web based environmental communication provides a personalised source of information. Information can be targeted to specific stakeholders through ‘pull’ based technologies, such as hyperlinks and menus on a website, which provide customised information. Conversely, ‘push’ based technologies, in the form of email alerts, can be used to send environmental information to stakeholders26.

### 3.4.3.5 Multiple Addressability

In relation to the multiple addressability (Sproull, 1991) criterion, social and environmental reports, media releases and the web target a diverse range of stakeholders when compared to the other media.

The needs of those interested in financial issues usually dominate the reporting requirements for annual reports (Cooper & Sherer, 1984; O’Dwyer, 2000). In Australia,

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26 Pull based technology mainly refers to users having to surf websites and ‘pull’ information from it. On the other hand, push based technology relates to situations when information is ‘pushed’ to users through mechanisms such as emails and instant messaging (Isenmann & Lenz, 2001).
for instance, the Statement of Accounting Concepts (SAC) 2 regards resource providers, recipients of goods and services, parties performing a review or oversight function as well as management and governing bodies as the users of general purpose annual reports (Australian Accounting Research Foundation, 1990). It emphasises the need for the disclosure of financial issues to these users to allow them to make economically useful decisions. Thus, these reports are widely accessible to financial stakeholders.

As social and environmental reports are addressed to anyone interested in a corporation’s environmental agenda (ACCA, 2001a), multiple stakeholders can be targeted. Moreover, media releases are likely to target a wider audience than advertisements and brochures. Newsletters usually target specific stakeholders.

Multiple addressability is another feature that can be enabled through web based environmental communication. The web has mass communication and global reach capabilities. Environmental information can be communicated to an extensive range of stakeholders and distance is not always a barrier to communication. Thus, anyone anywhere in the world with web access can potentially receive environmental information.

3.4.3.6 Externally Recordable

The externally recordable (Sproull, 1991) features of print based media are mainly restricted to manual mechanisms. Conversely, web based environmental communication can utilise electronic tools to enhance the externally recordable capability.

In relation to periodic hardcopy reports, past annual reports and social and environmental reports can be accessed by contacting the company. It may also be possible to access past advertisements, brochures, newsletters and media releases. Users of these means of communication can be traced manually, and the information is mainly static.

The externally recordable feature applies to web based environmental communication. Stakeholders can maintain a record of environmental information by downloading and printing current environmental information. The externally recordable tool also applies to past information because websites can provide archived information. For instance,
past social and environmental reports can be made available on a website and accessed by various stakeholders. From a corporate perspective, making such information accessible to stakeholders can be encouraged because websites are controlled by companies and their dynamic nature enables existing information to be amended easily and actual usage by stakeholders to be assessed. Tools such as hit counters, tracking software and electronic guestbooks enable corporations to track the use of their website by stakeholders. Tracking software can also inform the future communication of environmental information because it reveals what specific information is being used by stakeholders. It can potentially improve corporate understanding of stakeholder needs.

### 3.4.3.7 Computer Processable Memory

Computer processable memory (Sproull, 1991) is restricted for print based mechanisms. However, this feature can be an integral component of web based environmental communication.

Manual searching and analysis is possible for annual reports, environmental reports, advertisements, brochures, newsletters and media releases. Computer processable memory is unable to be used by these modes of communication.

In relation to web based environmental communication, environmental information can be navigated through search engines. Analytical tools enable environmental information to be manipulated electronically. For example, trend analysis can be performed with technological tools. Such tools improve upon the mere disclosure of environmental information as they allow stakeholders to search for specific information and analyse it in different ways.

### 3.4.3.8 Concurrency

Concurrency (Valacich et al., 1993) is enabled through social and environmental reports as well as the web. Annual reports, advertisements, brochures, newsletters and media releases provide a limited means of enabling concurrency.

There is a lack of evidence on the interactive processes that can be undertaken for annual report environmental communication. Interaction with financial stakeholders in
relation to environmental issues communicated in annual reports is possible at annual general meetings or through personal contacts with ‘powerful’ stakeholders such as major shareholders.

Feedback slips in social and environmental reports can be used to gauge stakeholder perceptions of the company’s environmental position (ACCA, 2001a). Private briefings and public meetings can also be held to engage with major stakeholder groups (Gao & Zhang, 2001). Surveys of stakeholder representative groups can even be utilised to receive feedback on environmental issues (Gao & Zhang, 2001).

Very little is known about the feedback mechanisms for advertisements, brochures, newsletters and media releases. These mechanisms can lead to some level of interaction. For instance, information provided through a media release can lead to certain stakeholders contacting a company and requesting further information.

Concurrency can be enabled through web based environmental communication. Feedback mechanisms such as emails and electronic feedback forms and surveys can lead to interaction with stakeholders. Two-way interaction is enabled through the use of specific features of the web. Tools ranging from a simple email facility through to advanced mechanisms such as bulletin boards, discussion fora and chatrooms enable interaction with stakeholders, albeit electronically. Hence, environmental communication through the web is not restricted to reporting; it allows interaction with numerous stakeholders.

3.4.4 Summary

The discussion so far highlights that developments in the medium enable corporate communication processes to respond to the increasing importance of environmental issues and extensive stakeholder pressures. Social and environmental reports, for instance, enable multiple addressability and personal source communication with numerous stakeholder groups and have the potential for enabling interaction (concurrency). These reports therefore extend the capabilities of the corporate annual report. Conversely, media releases can be used with periodic reports to enable

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27 Feedback slips can also be used for corporate annual reports, but these emphasise financial issues more extensively than environmental matters.
immediacy of communication regarding urgent issues. Newsletters can provide a personal source of information for specific stakeholders. The web also enhances the capabilities of these traditional print based media in relation to the Media Richness Framework characteristics.

Table 3.1 highlights that the newer media enhance the capabilities of the existing media. It also illustrates that the web is a relatively rich medium for the communication of environmental issues to stakeholders. The web can provide capabilities for both engagement and environmental disclosure.

The web can enable companies to communicate environmental information instantly (immediacy) to numerous stakeholders (multiple addressability) and to interact and seek their views (concurrency). Various approaches to presenting (multiple cues) and organising the information (language variety) can be used.

Environmental communication can be centred on the needs of stakeholders (personal source) while search and analytical tools can allow ease of navigation and analysis of information for them (computer processable memory). Current and archived information (which can be amended) can be downloaded and printed by stakeholders, and the extent to which such information has been used by them can also be ascertained through the use of web based technologies (externally recordable).

An example can illustrate the benefits of web usage for environmental communication. If an environmental incident occurs, a corporation can utilise the web to communicate transparently with its stakeholders. During such an instance, the organisation requires immediacy in its communication. It can utilise its website to disclose environmental information to its stakeholders and focus on the multiple cues, language variety and personal source features of the web to enhance disclosure. A corporation can even utilise webcasts to communicate information on the environmental incident. The multiple addressability of the web will enable numerous stakeholders to access information about the environmental incident. Moreover, the externally recordable and computer processable memory features of the web can assist in organising and analysing environmental information as well as trends in the use of this information. Tracking software, for instance, can be utilised to gain an understanding of the effectiveness of the company’s environmental communication process during this
<table>
<thead>
<tr>
<th>Media Richness Framework feature</th>
<th>Annual Report</th>
<th>Environmental Report</th>
<th>Media Release, Newsletters, Advertisements and Brochures</th>
<th>Web</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Immediacy</strong></td>
<td>Periodic</td>
<td>Periodic</td>
<td>Mainly ad hoc</td>
<td>Timely</td>
</tr>
<tr>
<td><strong>Multiple Cues</strong></td>
<td>Limited means of presenting information in hardcopy form.</td>
<td>Limited means of presenting information in hardcopy form.</td>
<td>Limited means of presenting information in hardcopy form.</td>
<td>Presentation flexibility and visibility provide multiple cues for information dissemination.</td>
</tr>
<tr>
<td><strong>Language Variety</strong></td>
<td>Restricted to a general report, with limited means of organising information in hardcopy form.</td>
<td>Restricted to report form, limited means of organising information in hardcopy form.</td>
<td>Limited means of organising information in hardcopy form.</td>
<td>Information can be organised through hyperlinks, menus, portals and other web based tools. Allows increased information in multiple formats. Integration of information is possible through hyperlinks to another section, page or website.</td>
</tr>
<tr>
<td><strong>Personal Source</strong></td>
<td>Information is geared towards the needs of a general audience, usually the users of accounting information.</td>
<td>Targets numerous stakeholders with environmental interests.</td>
<td>Information is geared towards the needs of a massive general audience for media releases, a general audience for advertisements and brochures and selected stakeholders for newsletters.</td>
<td>Hyperlinks and menus can customise information for different stakeholders; information can be pushed to stakeholders through email alerts.</td>
</tr>
<tr>
<td><strong>Multiple Addressability</strong></td>
<td>Focus is on users of accounting information.</td>
<td>Multiple stakeholders with environmental interests are targeted.</td>
<td>Media releases reach a mass audience, advertisements and brochures can target numerous stakeholders while limited stakeholders are targeted by newsletters.</td>
<td>Anyone with web access can access environmental information.</td>
</tr>
<tr>
<td><strong>Externally Recordable</strong></td>
<td>Current and past reports can be available from a company. Manual ways of tracing users. Information is mainly static.</td>
<td>Current and past reports can be available from a company. Manual ways of tracing users. Information is mainly static.</td>
<td>Archived information can be available from a company. Manual ways of tracing users. Information is mainly static.</td>
<td>Information can be downloaded and printed. Reports for multiple years can be archived on a website. Tools such as the hit counter facility, tracking software or an electronic guestbook can be utilised to keep a record of users. Dynamic nature of websites enables amendments to existing information.</td>
</tr>
<tr>
<td><strong>Concurrency</strong></td>
<td>Feedback and interaction is possible through annual general meetings and private contacts.</td>
<td>Feedback and interaction is possible through feedback forms, briefings and meetings and surveys.</td>
<td>Limited approaches for feedback and interaction, with mechanisms such as those used for social and environmental reports being utilised.</td>
<td>Electronic mechanisms for obtaining feedback such as emails, electronic surveys and automatic feedback forms. Two-way interaction is possible through emails, discussion fora, bulletin boards and chatrooms.</td>
</tr>
</tbody>
</table>
incident. Lastly, the organisation can also interact with its stakeholders through the concurrency features of the web.

3.5 Prior Research into Web Based Environmental Communication

3.5.1 Overview

The early literature on web based environmental communication indicates that larger companies were more likely to use the web for communicating environmental issues. It also shows that web based environmental communication was dominated by companies operating in developed countries.

Craven and Otsmani (1999) postulate that size plays a crucial role in the level of social and environmental disclosure on the web by UK corporations. Their findings indicate that larger companies are more likely to utilise their website for social and environmental reporting.

SustainAbility/UNEP (1999) carried out an extensive survey of environmental reporting on the web by corporations around the world. The survey highlighted that such a form of reporting was emerging but was restricted to the developed world. It also described the best practices of certain corporations through a survey of their environmental/sustainability staff.

Jones et al. (1999) used the criteria for website evaluation developed in an earlier paper (Jones et al., 1998) as the basis for analysing the websites of 275 global companies. Further, the authors sent a general survey to 100 environmental managers that addressed issues related to their company’s website. Their findings suggest that companies were not fully exploiting all of the capabilities offered by the web to disclose environmental information. Environmental reporting on the web was merely a replication of hardcopy corporate environmental reports for a large number of companies.

Williams and Pei (1999) carried out an empirical study of social and environmental disclosure on the websites of corporations in the Asia Pacific region and compared web

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28 Some of these studies are related to social and environmental issues. Environmental issues are seen as a subset of social issues in this thesis. Therefore, the key findings of this literature also relate to web based environmental communication.
based disclosure with annual report disclosure. Australia, Singapore, Malaysia and Hong Kong were chosen for analysis. The authors suggested that Australian and Singaporean companies reported more extensively on their website than in their annual report. Social and environmental disclosure on websites in the other countries was found to be limited and selective.

More recent literature has focused specifically on larger companies operating in the developed world. The common finding associated with these studies is that companies are not extensively utilising the web for environmental communication.

SustainAbility/UNEP (2001) carried out a survey of the websites of the leading sustainability reporters according to its global reporters top 50. The findings indicate that companies gave very little prominence to sustainability information on websites. Users had to navigate the websites extensively in order to obtain useful information about social and environmental issues. The study also evaluated the communication potential of the web and gave examples of the limited companies that were the leading practitioners in using specific communication features.

Patten (2002) found that even though insurance companies in the US are leaders in utilizing the web for marketing purposes, their disclosure of financial information through the web is moderate and their social responsibility disclosure through the web is quite low. This finding suggests that even though companies can be leaders in the use of web based technologies, they may not increase their disclosure of financial and social information through their website.

Rikhardsson et al. (2002) explored social and environmental disclosures on the websites of the Global Fortune 500 companies. The results indicate that while companies were utilising their website for environmental reporting, disclosure was often limited to policies and descriptions rather than performance information. The potential of the Internet had also not been utilised extensively by these companies. Moreover, the authors contended that the communication of environmental issues was more dominant than social issues and that companies in environmentally sensitive industries communicated relatively more than companies without such highly visible environmental impacts.
Cormier and Magnan (2003) related information costs and proprietary costs coupled with media exposure to both print and web based environmental disclosure by US corporations. A firm’s context (age of fixed assets, size, SEC regulations) as well as industry wide trends and practices were also related to disclosure through both print and web based media. Their findings suggest that there is quite an extensive overlap between print and web media. The authors interpreted this as an inability to exploit the potential of the web.

Andrew (2003) undertook an exploratory investigation of the ways in which 64 randomly selected Australian publicly listed companies were using the Internet to disclose environmental information. The emphasis was on identifying whether environmental information featured on websites, how it featured and the ease with which it could be accessed. The findings indicate that environmental disclosure was highly dependent on the industry, the type of environmental disclosure did not vary significantly from that provided in text based reports and the potential of web based media was far from being utilised.

Patten and Crampton (2004) analysed the annual reports and corporate webpages of 62 US firms in both the chemical and electronics industries for the year 1998. Firms in the chemical industry were regarded as more environmentally sensitive than those in the electronics industry. The results indicated that companies appeared to be adding some additional non-redundant environmental information to their website beyond that required in the annual report. However, there was a lack of negative environmental disclosure. Legitimacy variables were also associated with differences in positive and neutral environmental disclosure. This finding led the authors to conclude that Internet disclosure focuses more on legitimation than greater corporate accountability. The authors’ perception of legitimacy as a negative issue differs from the interpretation of legitimacy identified in the previous chapter.

A number of recent studies have explored the use of the web for engaging with stakeholders. These have found varying usage of the interactive potential of the web.

Cooper (2003) utilised the stakeholder management literature to assess the use of the web by UK electricity companies to engage with their stakeholders. The findings highlighted the selective use of the web to communicate with stakeholders. The author
contended that the web had the potential to enhance corporate accountability in the future but that it was unclear whether this benefit could be realised. Suggestions for undertaking similar research on a longitudinal basis were also put forward.

Unerman and Bennett (2004) focused on the interactivity feature of the web. They applied the Habermasian ‘ideal speech’ situation to Shell’s global stakeholder dialogue, which was accessed through a discussion forum on its website. The authors contended that while it is not possible for all the conditions for an ideal speech situation to be satisfied in practice, the web does potentially empower stakeholders to engage in democratic debates. Companies can also obtain feedback from stakeholders by utilising mechanisms such as a discussion forum for engaging with stakeholders. The authors also highlighted that stakeholder use of such technologies needs to be more widespread and that there should be greater transparency on the impact of Internet discourse on corporate actions.

Adams and Frost (2004) analysed the development of the corporate website as a communication medium by companies in Australia, UK and Germany. More specifically, they examined their use of the web to report ethical, social and environmental issues as well as to engage with stakeholders. A triangulation of methods was used to collect data—a longitudinal survey of corporate websites; a postal survey; and interviews with personnel of selected companies. The findings suggest that the communication of ethical, social and environmental issues through the web is limited. It was highlighted that corporate communication was not the primary objective of the website, there was no strategic consideration of the website as a communication medium and the development of websites was quite restricted. The authors also revealed that the main purpose of developing a corporate website was to raise corporate awareness and to improve corporate image rather than to report ethical, social and environmental issues and use web technologies to engage with stakeholders. They recommended that companies increase the content of their disclosure through the web; improve accessibility to, and increase the verification of, information presented on the website; and have more sophisticated feedback mechanisms on the website to enable engagement.

A study by Campbell and Beck (2004) is related to a specific social issue but does provide some indication of the extent to which companies are strategically using the
The authors suggest that, in addition to advertising, selling and reporting purposes, companies use the web for reputation management purposes. This assertion was based on evidence of disclosure through the websites of eight international companies that had attracted allegations of ethical malpractice over a number of years.

Frost et al. (2005) explored environmental communication in a range of media. The authors examined the nature and extent of sustainability reporting in the annual report, discrete (social and environmental) reports and the website of companies listed on the Australian Stock Exchange. Even though the annual report was found to be the least useful source of information, highlighting a transition to ‘newer media’, the overall level of disclosure was found to be quite low across all the media.

### 3.5.2 Application of Media Richness Framework to prior research

Prior studies have focused on the extent of web usage for environmental communication, but these lack a framework for assessing the communication potential of the web in practice. A framework for web based environmental communication is desirable because it can lead to uniformity in the literature on the use of the web and thereby enable comparisons among the results of different studies. Currently, the content of environmental disclosure can be compared, but there are no consistent guidelines for conceptualising the use of specific features of the medium for environmental communication.

The extent to which the web is utilised for environmental communication can be addressed through an assessment of the use of the specific characteristics associated with the Media Richness Framework. This assessment will show the degree to which the features of the web, which extend the capabilities of traditional media, are currently utilised in practice. An analysis of the literature using the Media Richness Framework is provided in Table 3.2.
<table>
<thead>
<tr>
<th>Prior Studies</th>
<th>Immediacy</th>
<th>Multiple Cues</th>
<th>Language Variety</th>
<th>Personal Source</th>
<th>Multiple Addressability</th>
<th>Externally Recordable</th>
<th>Computer Processable Memory</th>
<th>Concurrency</th>
</tr>
</thead>
</table>

Table 3.2: Analysis of Media Richness Framework characteristics in prior studies.
Table 3.2: Analysis of Media Richness Framework characteristics in prior studies (cont.)

<table>
<thead>
<tr>
<th>Prior Studies</th>
<th>In immediacy</th>
<th>Multiple Cues</th>
<th>Language Variety</th>
<th>Personal Source</th>
<th>Multiple Addressability</th>
<th>Externally Recordable</th>
<th>Computer Processable Memory</th>
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</thead>
</table>
The notion of immediacy has some recognition in prior literature. Studies such as those by Jones et al. (1999), SustainAbility/UNEP (1999, 2001) and Cooper (2003) acknowledge the dynamic nature of websites and highlight that information communicated through it has the potential to change easily within a reasonable time. The studies by Adams and Frost (2004) and Unerman and Bennett (2004) are the only ones to have provided details of web based environmental communication over time. The former found some changes in relation to website communication but did not find any evidence of the systematic use of the web for timely environmental communication. The latter highlighted that extensive postings were made on Shell’s discussion forum over the period of analysis.

In relation to the multiple cues feature, a number of studies have found evidence of the use of graphics, animation and audio and video (multimedia) facilities on corporate websites. These include studies by SustainAbility/UNEP (1999, 2001), Jones et al. (1999), Rikhardsson et al. (2002), Andrew (2003) and Adams and Frost (2004). SustainAbility/UNEP (1999, 2001) and Adams and Frost (2004) have also indicated that companies often utilise graphics more extensively than tools such as animation, audio and video. The restricted use of animated and multimedia tools is a response to the potentially adverse effect they have on the access speed to the website.

The emphasis in the literature on language variety is quite extensive (see SustainAbility/UNEP 1999, 2001; Jones et al., 1999; Rikhardsson et al. 2002; Andrew, 2003; Adams & Frost, 2004). The research focus has been mainly on the use of hyperlinks, menus and other navigational tools. The use of different report formats has also been discussed. This suggests that there has been an increasing uptake of all these tools by companies over the years. SustainAbility/UNEP (2001) indicates that evidence of the use of web portals is emerging and that a limited number of companies have been utilising such tools.

Prior studies have also considered the personal source feature. SustainAbility/UNEP (1999, 2001), Rikhardsson et al. (2002), and Cooper (2003) have discussed the ability of the web to provide information customised to the needs of different stakeholders. Adams and Frost (2004) have focused on the use of email alerts by companies. These studies have indicated that such tools are used by a limited number of companies. Moreover, Unerman and Bennett (2004), in their case study of Shell’s discussion
forum, have assessed the ability of the web to enable stakeholders to engage in democratic debates.

In relation to the multiple addressability feature, SustainAbility/UNEP (1999, 2001), Jones et al. (1999), Cooper (2003), Unerman and Bennett (2004) and Adams and Frost (2004) have discussed the mass communication and global reach of the web. These studies have highlighted that multiple addressability is a major influence on the uptake of web based environmental communication by companies.

The externally recordable feature has been discussed in a limited number of studies. SustainAbility/UNEP (1999, 2001) and Rikhardsson et al. (2002) focused on the ability to print and download information from websites. These studies suggest that such facilities are available on a limited number of websites. Jones et al. (1999) and Adams and Frost (2004) conducted surveys of corporate personnel and found that companies utilise tracking software to assess trends in the usage of their website by external stakeholders. The use of tracking software by companies increased in the period between the Jones et al. (1999) study and the Adams and Frost (2004) study.

The major emphasis in the literature in relation to the computer processable memory feature has been on the search based capabilities provided by the web. Studies by SustainAbility/UNEP (1999, 2001), Jones et al. (1999), Rikhardsson et al. (2002), Andrew (2003) and Adams and Frost (2004) have discussed the usefulness of search engines and other navigational tools. Even though the earlier literature found that not all companies were utilising such tools, more recent studies have found that these tools are available on most websites. SustainAbility/UNEP (1999) mentions the use of analytical tools but found that companies were not utilising such tools. This finding could be expected given that web based environmental communication was in its infancy at the time the study was undertaken.

Prior studies have also acknowledged the concurrency capabilities provided by the web. They include SustainAbility/UNEP (1999, 2001), Jones et al. (1999), Rikhardsson et al. (2002), Cooper (2003), Adams and Frost (2004) and Unerman and Bennett (2004). With the exception of Unerman and Bennett (2004), the other studies suggest that emails and feedback mechanisms are utilised more extensively than tools such as discussion fora, bulletin boards and chatrooms, which were barely used by companies.
3.5.3 Literature gaps

The review of prior studies on web based environmental communication discussed here highlights several gaps in the literature. The existence of such gaps implies that there is the potential to extend the literature on web based environmental communication.

Table 3.2 indicates that limited studies have considered the environmental communication potential of the web. It is also evident from the table that most studies are cross-sectional and, therefore, represent snapshots of web based communication at a single point in time. The studies by Adams and Frost (2004) and Unerman and Bennett (2004) are the exceptions. Adams and Frost (2004) studied web based disclosure in intervals of three months over a number of years while Unerman and Bennett (2004) explored the discussion forum on Shell’s website over a two and a half year period.

Table 3.2 also indicates that some of these studies have focused only on the information content of the websites. Content analysis, a method used to examine annual reports, has been applied to studies of web based disclosure. No attempt has been made to ascertain the features of the web that enable environmental communication to be a totally different process from environmental reporting through print media. Studies such as those by Craven and Otsmani (1999), Williams and Pei (1999), Patten (2002), Patten and Crampton (2004), Campbell and Beck (2004) and Frost et al (2005) have made important contributions to the web based environmental communication literature through an emphasis on the information content on websites. However, they have provided limited insights into how companies are utilising the communication potential of the web.

There is also variation in the extent to which the benefits of the web are addressed in SustainAbility/UNEP (1999, 2001), Jones et al. (1999), Rikhardsson et al. (2002), Andrew (2003), Cooper (2003), Adams and Frost (2004) and Unerman and Bennett (2004). It can therefore be concluded that the research literature as it currently exists has not fully addressed the communication potential of the web in practice.

The Media Richness Framework, developed in section 3.4 and applied to prior studies in section 3.5.2, addresses the gap in the literature regarding the assessment of the communication potential of the web. This framework is consistent with the limited prior
literature that has considered the communication potential of the web. At the same time, it provides a uniform conceptual basis for assessing the extent of web usage for environmental communication.

Another limitation of the existing literature is that most of the studies discussed here are mainly descriptive. With the exception of Jones et al. (1999), SustainAbility/UNEP (1999) and Adams and Frost (2004), the studies reported here conducted only a descriptive analysis of websites. There is a need to go beyond these descriptive studies and assess the factors that influence web based environmental communication. For instance, as discussed in section 2.5.3, Adams (2002) has highlighted that internal organisational factors can affect social and environmental communication. A study into the various factors (including internal factors) that affect the extent of web usage will provide an in-depth understanding of the issues that enable or constrain the use of the communication potential of the web in practice.

The Media Richness Framework provides a basis for assessing the communication potential of the web and its actual usage. However, it does not provide an explanation of the factors that influence the use of the web for environmental communication. In order to address this issue, the elements relating to the use of a medium in specific contexts need to be addressed. Such research requires more than a review of websites. The factors influencing the use of the web by specific corporations can be assessed through methods such as interviews.

Another significant limitation in the current literature is that most web based environmental communication studies are focused at a general level and use large samples. For instance, apart from the Adams and Frost (2004), Unerman and Bennett (2004) and Campbell and Beck (2004) studies, the other studies discussed here provide only aggregated results. Patten (2002), Cooper (2003) and Patten and Crampton (2004) have examined specific industries. However, they have generalised from large samples rather than sought to develop an in-depth understanding of current practices in a particular industry.

The situation in a particular industry or in specific companies can produce results that differ from the general findings identified in prior studies, especially if the industry has a range of stakeholder pressures brought about by its environmentally sensitive nature.
For instance, the findings of studies by Rikhardsson et al. (2002) and Andrew (2003) accord with the findings of earlier environmental reporting studies, discussed in section 2.5.4, which have associated industry effects to environmental communication. Thus, a need arises for industry specific studies for web based environmental communication. These studies have the potential to provide an in-depth and specific understanding of current practices.

3.6 Summary

This chapter has reviewed the various media used for communicating environmental issues. The literature highlights that, over time, the increasing importance of corporate environmental issues and stakeholder concerns about the environmental performance of corporations has affected the medium used for environmental communication. The web has the potential to extend the capabilities of the traditional environmental communication media by enabling engagement with stakeholders in addition to enhancing environmental reporting.

This chapter has highlighted that the Media Richness Framework can be used to ascertain the extent to which the web is utilised in practice. It is also argued that research should transcend the analysis of websites and seek to establish the factors influencing the use of the web in specific contexts.

This study does not imply that the web is a better medium than the traditional print media for environmental communication or that it should replace print media. The evidence indicates that companies use a range of different media to communicate with stakeholders (Zeghal & Ahmed, 1990; Unerman, 2000; Tilt, 2001; Frost et al., 2005). The issue that is of concern in this thesis is that the media for communication have evolved over time (McLuhan, 1964) in relation to the increasing importance of environmental issues and stakeholders and that the web offers certain capabilities for enhancing the environmental communication process. It is of interest to explore these capabilities, to ascertain the extent to which they are used in practice and to establish the factors that explain current practices.

This research also does not claim that the web can address all the issues related to the communication of environmental information. However, it is suggested that the use of
the web does provide various benefits for engaging with, and reporting to, stakeholders. In addition to these benefits, print media reports such as annual reports, social and environmental reports, newsletters and media releases for various time periods can be placed on the web. Similarly, other electronic tools, such as videos, compact discs (CD), and messaging, can be used in conjunction with the web. Consequently, the web can complement other forms of communication, confirming McLuhan’s proposition that new media extend the capabilities of the older media.

This chapter and the former one have established the relationship between earlier studies and the current research in relation to environmental communication as well as web based environmental communication. The study reported in this thesis seeks to address a critical issue—the factors influencing the extent to which the web is utilised for environmental communication—that has the potential to build upon earlier research. The research model used to execute the study is described in the following chapter.
Chapter Four: Research Model

4.1 Introduction

This chapter develops the research model for the study by drawing upon the literature discussed in the preceding two chapters. The model provides the theoretical basis for addressing the central research question of the thesis:

What are the factors that influence the extent to which the web is utilised by corporations in an environmentally sensitive industry to communicate with their stakeholders in relation to environmental issues?

The previous chapter highlighted that the extent to which the web is utilised for environmental communication can be explored using the Media Richness Framework. The research model developed in this chapter indicates that the use of the various Media Richness Framework features is affected by a number of factors. Management’s need for environmental communication through the web is the primary influence on a company’s use of the communication potential of the web. This matter is discussed in section 4.2. Moreover, contextual factors can influence this need and affect the extent to which the web is used for environmental communication. These issues are explored in section 4.3. The research model is discussed in section 4.4 and specific themes that guided the collection and analysis of data for this study are stated.

4.2 Management’s Needs for Web Based Environmental Communication

The seminal work by Henderson and Venkatraman (1993) in the information systems literature informed the research model (illustrated in Figure 4.1) for this study. These authors have developed a ‘strategic alignment model’ that integrates business strategy, organisational infrastructure, information systems strategy and information systems infrastructure. A critical implication of their model is that the use of information systems by organisations is driven by business needs. Information systems can enhance productivity if there is an alignment between business and information systems issues.

The implications of these theoretical insights for the current study are that the use of a medium by organisations is influenced by management’s need for communication. It is
argued in this thesis that the extent to which the richness offered by a medium, as conceptualised through the Media Richness Framework, is utilised in practice is dependent on management’s needs for communication through a particular medium.

The focus of this research, as identified in the second chapter, is on environmental communication. Thus, it is argued that management’s need for environmental communication will lead to the use of the features of a medium that can facilitate these needs. Timeliness, accessibility, presentation and organisation, and interaction are regarded in this research as the essential environmental communication needs. These needs are derived from the financial reporting and environmental communication literature.

As discussed in section 3.3, environmental communication processes have their roots in financial reporting, with annual reports utilised as the ‘earliest’ communication medium. Thus, environmental reporting is based on communication needs that have been associated with financial reporting. These needs include timeliness, accessibility, and presentation and organisation. As discussed in section 2.5.1, the recent literature has emphasised the notion of engagement. Therefore, environmental communication has evolved from (financial) environmental reporting needs to encompass the interaction communication need.

The notion of timeliness has its roots in the seminal work of Chambers (1966), who argued that accounting should serve a contemporary role in society rather than be restricted to the measurement of historical performance. Over time, developments in accounting, such as the ‘conceptual framework’ (Horngren, 1981), have considered timeliness to be a critical characteristic of accounting information. Applying these insights to environmental communication, it is argued that timeliness is a critical need in relation to the communication of environmental issues to stakeholders.

Parker (1982) highlights that corporate annual reporting should serve a mass communication perspective. He posits that a range of users (stakeholders) are affected by corporate activity and, therefore, reporting should be accessible to these parties. Applying these arguments to environmental communication, it is proposed that as a range of stakeholders are affected by corporate environmental issues (see section 2.4),
accessibility is a critical issue for the communication of environmental issues to stakeholders.

Recent studies have focused on the presentation and organisation capabilities utilised in annual reports. The emphasis has been primarily on the impact of graphs (Beattie & Jones, 1992) and organisational capabilities (Courtis, 2000) on communication. An application of these insights to environmental communication highlights that presentation and organisation features are gaining prominence and, therefore, are also a critical communication need. There is also a need to explore these capabilities in a range of media rather than restrict the analysis of presentation and organisation features to communication in annual reports.

As discussed in section 2.5.1, corporate environmental reporting processes have been extended to incorporate engagement with stakeholders. Thus, interaction with stakeholders is also an essential communication need for corporations.

The Media Richness Framework features highlight that a medium can facilitate the environmental communication needs developed in this research. Table 4.1 highlights this linkage.

<table>
<thead>
<tr>
<th>Environmental Communication Need</th>
<th>Media Richness Framework Feature</th>
</tr>
</thead>
<tbody>
<tr>
<td>Timeliness</td>
<td>Immediacy</td>
</tr>
<tr>
<td>Accessibility</td>
<td>Multiple Addressability</td>
</tr>
<tr>
<td>Presentation and Organisation</td>
<td>Multiple Cues, Language Variety, Personal Source, Computer Processable</td>
</tr>
<tr>
<td></td>
<td>Memory and Externally Recordable</td>
</tr>
<tr>
<td>Interaction</td>
<td>Concurrency, Personal Source</td>
</tr>
</tbody>
</table>

Table 4.1: Environmental Communication needs and Media Richness Framework features

The timeliness and accessibility of environmental communication needs can be facilitated by the immediacy and multiple addressability features of a medium. Moreover, presentation and organisation and interactive needs can be facilitated by specific features of a medium. These are also conceptualised by the Media Richness Framework features.
Multiple cues, language variety, personal source, externally recordable and computer processable memory can enable presentation and organisation. Multiple cues enable presentation visibility and flexibility. Language variety features enable information to be organised in such a way that its understandability is improved. Personal source capabilities facilitate the customisation of information based on the needs of different users. Externally recordable features enable a record of the communication process to be obtained. This occurs in the ability to document and modify the process of communication, trace users and provide archived information. Lastly, computer processable memory capabilities provide tools to assist in the navigation and analysis of information.

The personal source and concurrency features of a medium enable interaction. A personal source is required to facilitate interaction. Concurrency in the form of two-way interaction can also be enabled through use of a particular communication medium.

Chapter Three demonstrated that the web is a rich medium for environmental communication. Therefore, it is argued that the extent to which the features of the web, conceptualised through the Media Richness Framework, are used in practice is contingent on the extent to which management requires a need for environmental communication through the web medium.²⁹

The web does have the benefit of immediacy but its usage is dependent on an organisation’s need for timely communication through the web. If timeliness is critical, then immediacy will have extensive use. On the other hand, if timeliness is not that important to a corporation, immediacy will be limited. For instance, an environmental incident can trigger varying levels of immediacy in communication by companies. Some companies will prefer to provide timely information to their stakeholders through the web during such an incident in order to keep them adequately informed and to manage undue stakeholder pressures. Conversely, other companies may have concerns about confidentiality and feel that timely communication through the web can in fact fuel further public pressure and attention. They will not be willing to communicate on a timely basis with their stakeholders through the use of the web.

²⁹ Management’s environmental communication needs can be met by other media. However, given that the focus of this research on the factors influencing the use of the web medium for communicating environmental issues to stakeholders, only web based environmental communication needs are considered in this study.
Similarly, a need for accessible communication through the web impacts the extent to which multiple addressability is utilised. If accessibility is critical, the mass communication and global reach offered by the web will be utilised for environmental communication. Conversely, these will not be utilised extensively if there is a limited need for improving accessibility to stakeholders in relation to the communication of environmental issues through the web medium. For instance, some companies will always make extensive environmental information available on their website in order to improve the dissemination of such information. Other companies may not share similar concerns and, therefore, will have restricted information available on their website.

Moreover, a need for presentation and organisation through the web will affect the extent of use of the multiple cues, language variety, personal source, externally recordable and computer processable memory features of the web. Some of these Media Richness Framework features can have extensive usage if management regards these features as a critical part of their environmental communication with stakeholders. For instance, a need for organisational and search capabilities will prompt extensive use of hyperlinks, menus, and search facilities on the corporate website. Other features can have limited usage if corporations place limited emphasis on them in relation to their presentation and organisation communication needs. An example is the limited use of animation in order to keep the website simple.

If a company needs to interact with its stakeholders through the web, personal source and concurrency features will be extensively utilised. In this instance, a range of tools, such as emails, discussion fora and chatrooms are available to enable stakeholders to electronically interact with the company. These will have restricted use if interaction through the web medium is not critical for management in their environmental communication process. For example, a general email address will merely be available on a website. Thus, the extent to which the personal source and concurrency features are used depends on management’s needs for interaction through the web.

In summary, in theory, the web has extensive communication potential but its usage in practice is contingent on whether companies need these communication capabilities. These needs are influenced by contextual factors.
4.3 Contextual Influences and Web Based Environmental Communication

It is argued in this thesis that whilst the use of the communication potential of the web corresponds to management’s need for environmental communication through the web medium, contextual factors influence these needs. These factors can enhance or constrain managerial needs for communication through the web and, therefore, contribute to the extent of web usage for environmental communication.

A medium could also have certain technical limitations that could restrict its usage (McLuhan, 1964). The web has potential technological limitations which can influence its usage for environmental communication. Limitations of web based technologies can be related to security, design, content and credibility problems. These can restrict the usage of the communication potential of the web.

Security problems (Ashbaugh et al., 1999; Trites, 1999; SustainAbility/UNEP, 1999, 2001) can abound due to the use of web based technologies. Issues such as hacking, viruses, the denial of service and network intrusions are critical matters that organisations need to deal with if they utilise the web for communication. However, there have been numerous recent developments in the information and communication technology industry to make the Internet secure. For instance, organisations often use a firewall to monitor network traffic and pre-empt potential security problems (SustainAbility/UNEP, 1999). Companies can also have stringent policies for Internet usage in order to minimise the malicious spread of viruses and to deter hacking by external parties.

Websites that are not well designed or promoted can create problems for stakeholders (Jones et al., 1998; ACCA, 2001b; Adams & Frost, 2004), especially those that are not familiar with the use of information and communication technology. Such stakeholders can be frustrated if they encounter difficulties accessing specific information due to poor website design. For instance, if stakeholders with limited information and communication technology literacy have to access several hyperlinks and even webpages to access particular information, they are unlikely to use the web extensively for their communication needs. In essence, a user friendly website with clear hyperlinks, menus and other design features is needed to enhance the use of the website by stakeholders. Companies can also adhere to the World Wide Web Consortium (W3C)
requirements, which provide standards for effective website design (SustainAbility/UNEP, 2001).

Information overload can arise through the use of the web (Lymer et al., 1999; Trites, 1999; SustainAbility/UNEP, 1999, 2001). The benefits of being able to provide increased information can lead to stakeholders having excessive information that they may not always find relevant. Thus, corporations need to exercise caution regarding the volume (and relevance) of information they present on their website. This process requires an awareness of the information needs of stakeholders so that disclosure is geared towards stakeholder expectations.

Authentication of the content presented on websites can also be questioned (Ashbaugh et al., 1999; Jones et al., 1999; Trites, 1999; SustainAbility/UNEP, 1999, 2001; FASB, 2000; Ettredge et al., 2001; Adams & Frost, 2004). Hoaxes can also be created online, which can have a damaging impact on a company’s reputation (SustainAbility/UNEP, 2001). Companies therefore need to highlight to their stakeholders that their website content is credible. Quite often, audited information or even statements attesting to the credibility of the information on the website can be provided. The use of W3C standards by companies could also provide credence to a website.

The information systems literature posits that the use of a medium for communication can also be explained by social factors (Trevino et al. 1987, 1990a, 2000; Fulk et al., 1990; Webster & Trevino, 1995). The existing literature on environmental communication, which was discussed in section 2.5, can be applied to web based environmental communication in order to establish the social influences on web based environmental communication.

As mentioned in section 2.5.2.2, Ullmann (1985) developed a strategic framework for linking economic performance, strategic posture and stakeholder power to social and environmental disclosure. Section 2.5.3 discussed the Adams (2002) conceptualisation of social and environmental reporting in relation to corporate characteristics, general contextual influences and internal organisational factors. These frameworks indicate that there are corporate (economic factors), internal (including strategic posture) and
external (stakeholder) contextual influences on social and environmental reporting. This study applies a similar classification to web based environmental communication by identifying economic factors, internal organisational factors and external stakeholder influences as specific influences on web based environmental communication. Given that the study is focused on large and environmentally sensitive companies in a particular industry, other corporate characteristics such as size and industry were regarded as constant across all companies.

Ullmann (1985) specifies that economic issues have a critical impact on social and environmental disclosure. Applying this principle to web based environmental communication, cost-benefit factors affect the use of a medium for communication. The web is often regarded as less costly than other information dissemination media (Ashbaugh et al., 1999; Lymer et al., 1999; Trites, 1999; FASB, 2000; Ettredge et al., 2001). Initial start-up costs for technology and its maintenance and personnel costs are balanced by the numerous benefits offered by the web. However, costs for website development and its maintenance can also restrict web based environmental communication (Adams & Frost, 2004). Thus, the use of the web for environmental communication can be related to economic factors.

Internal organisational factors (Adams, 2002) can also be related to web based environmental communication through corporate attitudes and strategic processes. In relation to attitudes towards web based environmental communication, organisational culture has an impact on the environmental communication practice of companies. Corporate attitudes towards environmental issues, stakeholders and the communication medium can determine the extent to which web based environmental communication takes place.

As discussed in Chapter Two, environmental and stakeholder issues are critical for corporations. Thus, positive attitudes towards the environment and stakeholders are enabling conditions for prompting environmental communication. These need to be matched with a recognition of the role of the medium in facilitating such communication.

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30 The basic premises of legitimacy theory can also be captured through internal organisational factors and external stakeholder influences. Stakeholder influences could prompt an internal organisational response, which could be to undertake various activities to legitimise corporate existence.
Web based environmental communication processes can also be related to the strategic posture of a company. As web based communication is a new and emerging way of disseminating environmental information, some companies can undertake it with the foresight that such communication will provide them with a strategic advantage in managing their relationships with stakeholders regarding environmental issues compared with the existing approaches undertaken by their competitors. They will aspire to be the leaders in such a form of communication. This premise is supported by the literature on social and environmental reporting, which suggests that certain companies seek to be the leaders in environmental disclosure (SustainAbility, 2000, 2002, 2004). It is interesting to consider whether this situation also applies to web based environmental communication.

Conversely, some companies will be conservative in their use of the web for environmental communication (Adams & Frost, 2004). Their strategic focus could be to utilise certain capabilities of the web rather than seek to be a leader in the use of web based technologies for environmental communication.

In summary, internal organisational factors will affect the extent to which the web is used for environmental communication—in particular, corporate attitudes towards the environment, stakeholders and the communication medium—and the resulting processes in terms of the strategic use of the web for environmental communication. For some organisations, the importance of environmental and stakeholder issues can translate to an increasing use of the web while for others this will not be the case. Moreover, organisations can have varying degrees of strategic processes to guide web based environmental communication.

In addition to the internal aspects of web based environmental communication, external stakeholder influences can also affect environmental communication. As discussed in section 2.5.2.2, there is evidence to suggest that stakeholders influence social and environmental disclosure (Ullmann, 1985; Roberts, 1992; Christopher et al., 1998). External stakeholder influences can be conceptualised through a consideration of external stakeholder pressures and the demand for environmental communication which leads to the use of a particular communication medium.
Pressure from stakeholders for increased and timely information and engagement can affect web based environmental communication. Such pressure requires a corporate response through communication via a ‘rich’ medium and the web has potential for facilitating such communication. Moreover, regulators or industry associations can encourage companies to undertake web based environmental communication. Initiatives from these bodies can provide an impetus for web based environmental communication. For instance, public social and environmental reports of companies and National Pollutant Inventory data are available on the Department of Environment and Heritage website. This encourages companies to present information electronically.

Conversely, a lack of demand from stakeholders for web based environmental communication can restrict current practices. Some stakeholders will prefer hardcopy documents over web based reports or prefer traditional access to online access (ACCA, 2001b). Certain stakeholders may lack information technology literacy and be reluctant to adapt to the changing nature of information management and dissemination (SustainAbility/UNEP, 2001). Thus, stakeholder preference and competence can affect web based environmental communication. Moreover, not all stakeholders have access to the Internet; this issue has been termed the ‘Digital Divide’ (SustainAbility/UNEP, 1999, 2001).

4.4 Research Model and Themes

A research model was required to address the central research question of this thesis. The literature review chapters provided the basis for its development. In the second chapter, the interrelationship among the environment, corporations and stakeholders was established. The need for the management of environmental impacts and stakeholders was highlighted. Corporate environmental communication was perceived as a tool for managing stakeholders in relation to environmental issues. An overview of the literature on environmental communication suggested that the use of a particular medium for environmental communication has not been explored in depth in past research.

The last chapter discussed the critical role of the medium for environmental communication and highlighted that the web is a rich medium. Media Richness Framework features provided a basis for assessing the potential of the web for
environmental communication. However, the extent to which the web is used in practice is influenced by a number of factors, which have been discussed in the current chapter.

Figure 4.1 illustrates the research model for this study. This model draws upon the premises of prior accounting (including environmental communication) and information systems research and applies them to the current study.

The research model posits that the communication potential of the web can be assessed using the Media Richness Framework features. The first objective of this study is to utilise the Media Richness Framework to undertake a comprehensive assessment of the extent of web usage for environmental communication. The extent of web usage is assessed in relation to the web based features that enable environmental communication rather than the extent of the environmental information content appearing on the website.

The model also highlights that the extent to which the communication potential of the web is utilised in practice is contingent on managerial needs for environmental communication through the web medium. These needs are influenced by contextual factors. Thus, the second research objective involves ascertaining the impact of managerial needs for communication through the web and the various contextual influences on web based environmental communication.

Specific research themes are developed on the basis of the research model and objectives. However, the study is also open to the possibility that other potential factors that have not been identified in theory can explain web based environmental communication. The research themes and associated questions for this study are as follows:

**Research theme 1: Extent of web usage**

What is the extent to which the communication potential of the web is utilised by corporations to communicate environmental issues to their stakeholders?
Figure 4.1: The research model for this study

Management’s Web based Environmental Communication Needs

- Timeliness
- Presentation and Organisation
- Accessibility
- Interaction

Contextual Factors

- Technological Limitations
- Economic Factors
- Internal Organisational Factors
- External Stakeholder Influences

Extent of Web usage

- Immediacy
- Multiple Cues
- Language Variety
- Personal Source
- Multiple Addressability
- Externally Recordable
- Computer Processable memory
- Concurrency
Research theme 2: Management’s web based environmental communication needs

What impact do management’s needs for environmental communication through the web medium have on the extent on web usage?

Research Theme 3: Contextual influences

What impact do contextual factors have in influencing management’s web based environmental communication needs?

Research Theme 4: Emerging themes

Are there other emerging factors that influence web based environmental communication?

4.5 Summary

This chapter has developed the research model for this study. It highlighted that whilst the Media Richness Framework can be used to assess the extent of web usage for environmental communication, a number of factors explain this usage. Management’s needs for environmental communication (timeliness, accessibility, presentation and organisation, and interaction) through the web medium affect the use of the web in practice. Technological limitations of the web, economic factors, internal organisational factors and external stakeholder influences affect these communication needs and can have varying influences on the extent to which the web is utilised for environmental communication. These themes guide the research process for this study, particularly the research methodology and the specific methods used to collect data.
Chapter Five: Methodology

5.1 Introduction

While the previous three chapters address the theoretical approach to the study, this chapter addresses its methodological issues. Section 5.2 presents a justification for the use of case study research in relation to the theoretical requirements of this study. A specific context was required to obtain an in-depth understanding of the web based environmental communication phenomena. Section 5.3 provides the reasons for the selection of the Australian minerals industry for the study.

The research design is described in section 5.4. Section 5.5 outlines the range of research methods used in the data collection phase of the research. Section 5.6 provides information on the approach to data analysis.

Section 5.7 describes the techniques employed to ensure the validity and reliability of the case study design and methods. Details of how the case studies were compiled are presented in section 5.8. Finally, section 5.9 identifies the methodological limitations of the project.

5.2 Methodological Selection

This research seeks to establish the factors which influence the extent to which the web is utilised for environmental communication by corporations in an environmentally sensitive industry. Its focus is assessing the extent of web usage and obtaining an in-depth understanding of the factors that could explain this usage. A model and themes were developed to assist the research process, and a methodology and specific methods were required to guide data collection and analysis.

The methodological approach for this study required a strategy which supported the development of prior theoretical constructs, as described in Chapter Four, and provided an in-depth understanding of a current practice (web based environmental communication) that has received limited coverage in the literature. The case study methodology matched this requirement because, as considered next, it emphasises the
development of prior theoretical constructs to guide the research and enables an in-depth investigation of a real-life contemporary phenomena in a particular context.

Yin (2003a:13-14) provides a thorough definition of a case study:

1. A case study is an empirical inquiry that
   • investigates a phenomenon within its real-life context, especially when
   • the boundaries between phenomenon and context are not clearly evident

2. The case inquiry
   • copes with the technically distinctive situation in which there will be many more variables of interest than data points, and as one result
   • relies on multiple sources of evidence, with data needing to converge in a triangulating fashion, and as another result
   • benefits from the prior development of theoretical propositions to guide data collection and analysis

A case study often requires a research framework to be established and applied to the evidence being collected (Humphrey & Scapens, 1996; Yin, 2003a, 2003b). The evidence supports the elements of the framework and provides scope for its extension through the discovery of specific findings that were not specified in the initial framework (Otley & Berry, 1994; Humphrey & Scapens, 1996; Yin, 2003a, 2003b). The emphasis is on a limited number of cases because an in-depth understanding of a specific context is required. It is the analytical generalisations rather than statistical generalisations that are critical in such work (Yin, 2003a, 2003b; Scapens, 2004).

In regard to the current study, environmental communication and information systems theoretical constructs were outlined in Chapter Four in order to guide the research process. Research themes are used to provide the basis for capturing the variables of interest. The study is open to the possibility that specific findings from the field could extend the research model. The emphasis is on obtaining an in-depth understanding of the web based environmental communication phenomena so that analytical generalisations of the factors influencing this practice can be captured.

Adams (2002) highlights that case study research is useful in assessing the processes that underpin social and environmental reporting practices and, therefore, has the potential to provide an in-depth understanding of particular contexts. The work of Gray
et al. (1997), Buhr (1998), Savage et al. (2002) and O’Donovan (2002a), which was identified in section 2.5.4, provides examples of this approach. Studies by Adams and Frost (2004), Campbell and Beck (2004) and Unerman and Bennett (2004), discussed in section 3.5.1, are some examples of web based environmental communication research that have focused on an in-depth analysis of specific companies’ practices. This research used a similar approach to these studies to gain an in-depth understanding of the factors that influence the use of the web in a particular industry.

There are few in-depth analyses of environmental communication that focus on a specific industry. With the exception of most North American studies31, many of the other environmental reporting studies discussed in section 2.5.4 and the majority of the web based environmental communication studies discussed in section 3.5.1 have focused on industry generally rather than in particular industries. There is a need for industry specific studies because they can provide valuable insights into the different contexts in which environmental information is communicated in particular industries.

Evidence from the literature on environmental reporting (see, for example, Patten, 1991; Gray et al., 1995; Deegan & Gordon, 1996; Adams et al., 1998; Cormier & Magnan, 2003; Campbell, 2003, 2004) and web based environmental communication (Rikhardsson et al., 2002; Andrew, 2003) indicates that industry effects influence environmental disclosure. Therefore, research should transcend general studies and examine web based environmental communication in specific contexts. This study addresses the gaps in the literature by utilising the case study approach to explore the web based environmental communication practice of specific companies in a particular environmentally sensitive industry where environmental communication is often critical.

5.3 Research Context

A suitable context was required for this research so that an in-depth understanding of current practices could be obtained. The focus of the study was an environmentally sensitive industry with a range of stakeholder influences. As highlighted in section 1.3, companies in environmentally sensitive industries are more likely to engage extensively in environmental communication than companies without such highly visible

31 These studies, however, focus on large sample sizes rather than provide in-depth insights into specific companies’ practices.
environmental impacts (Wilmshurst & Frost, 2000; Savage et al., 2002; Campbell, 2003, 2004).

Section 3.3 indicated that the medium for environmental communication has evolved in relation to the increasing importance of environmental issues and the needs of stakeholders. Thus, it was of interest to explore the use of the web medium in an industry with characteristics similar to those industries described in the literature review.

Companies in the Australian minerals industry were chosen for this study. Australia’s minerals industry has, in addition to its economic importance (Hancock, 2001; Hook, 2002, 2003), an environmentally sensitive nature (UNEP, 2000; Rae & Rouse, 2001; ABS, 2003a, 2003b). This places the industry under constant stakeholder scrutiny (MMSD/PWC, 2001; IIED, 2002; MMSD, 2002). The term ‘social licence to operate’ is often used in the Australian minerals industry to highlight the importance of environmental issues and stakeholders to mining corporations (Walker & Howard, 2002; IIED, 2002; MMSD, 2002; Hooke, 2002, 2003).

As highlighted in section 1.3, the response by the Australian minerals industry towards the increasing stakeholder pressure over corporate environmental performance has been the development of a number of initiatives, such as the code of environmental management (MCA, 2000) and the sustainable development framework entitled Enduring Value (MCA, 2004). The World Wide Fund for Nature (WWF) conducted the ‘Ore or Overburden’ survey of environmental reports of Australian mining companies in response to the development of the code of environmental management (WWF, 1999, 2000). This development influenced the subsequent reporting behaviour of companies in the Australian minerals industry (Deegan & Bloomquist, 2006).

The Minerals Council of Australia (MCA) also organises an annual sustainable development conference for its members in order to encourage discussion on the critical social and environmental issues facing the industry. Other prominent minerals industry initiatives include the Global Mining Initiative (IIED, 2002; MMSD, 2002) and the Mining Certification Evaluation Project (Rae & Rouse, 2001). The former represented a commitment by nine global mining companies in 1999 to establish a process of external engagement, research and analysis on a sustainable development strategy for the
minerals industry. The latter was a research project involving the WWF, a number of mining companies, the Commonwealth, Scientific, and Industrial Research Organisation (CSIRO) and the MCA. This project aimed to evaluate whether independent third party certification could be applied to mine sites.

The various environmental initiatives involving mining corporations and other organisations provide an impetus for companies in the Australian minerals industry to manage environmental issues and communicate extensively with their stakeholders. The critical importance of communicating environmental issues to stakeholders in this industry is also supported by recent literature on environmental communication in the Australian minerals industry. This literature includes the studies identified in section 2.5.4 which support stakeholder (Christopher et al., 1998) and legitimacy (Jantadej & Kent, 1999; Yongvanich & Guthrie, 2004) theory. Two other descriptive studies into the environmental reporting practices of mining companies are discussed here as they provide useful insights for the current study.

Peck and Sinding (2003) studied the environmental reporting practice of 30 global mining companies. A major finding was that Australian companies were leading best practice in environmental reporting compared with companies in Canada and the US. The reports of these companies were found to be data rich and were regarded as being influenced by high expectations of environmental performance by citizens of their country. Various voluntary initiatives, such as the MCA code of environmental management and the Greenhouse Challenge program, were suggested to have a positive impact on the disclosure levels of Australian companies.

Jenkins and Yakovleva (2006) explored social and environmental disclosure in the annual report and social and environmental reports (1999–2003) of the 10 largest global mining companies. Their findings suggest that whilst such disclosure has increased and has become more sophisticated, reporting companies can be classified according to a ‘leaders to laggards’ continuum. ‘Mature reporters’, ‘adolescents’ and ‘infants’ were terms used to categorise the variation in these companies’ social and environmental reporting (Jenkins and Yakovleva, 2006:279). The only Australian based company in this study was classified as a mature reporter. It was also found that the media for communicating environmental issues was evolving and that there was an increasing take-up of reporting on the web. The authors suggest that strong leadership and
cooperation from the leading companies was needed to support the laggards of the industry. This study, in addition to providing some support for the Peck and Sinding (2003) finding about the data richness of the environmental communication practices of Australian companies, highlights that companies in the minerals industry are increasingly using the web to communicate social and environmental issues to stakeholders.

The critical importance of environmental issues to companies and stakeholders in the Australian minerals industry suggests that a ‘rich’ communication process is needed to enable effective environmental communication. However, very little is known about the medium for enabling environmental communication in the Australian minerals industry because most literature to date has focused on print media.

As indicated in section 1.3, the nature of mining activities suggests that corporations in the minerals industry are unlikely to utilise the web extensively for marketing purposes compared with companies in other industries. Global evidence (Jenkins & Yakovleva, 2006) also indicates an increase in the use of the web for environmental communication by mining companies. Consequently, it was of academic and practitioner interest to explore the factors influencing the extent to which a potentially useful tool for corporate communication—the web—is utilised in an industry that is environmentally sensitive, requires stakeholder acceptance and is a leader in global environmental communication.

5.4 Research Design

Case study research uses either a single case or multiple cases as the unit of analysis (Yin, 2003a). The unit of analysis is defined by the initial research questions (Yin, 2003a). Given that the central question of this research was to explore factors that explain the corporate use of the web for environmental communication, the unit of analysis for the study was individual companies.

A multiple case study design was used in this study because, as the research discussed in section 3.5 indicates, companies are not extensively utilising the web for environmental communication and there is a lack of understanding of the factors influencing the use of the web for environmental communication in particular contexts. A single case was therefore considered not sufficient to address the objectives of this
research. Multiple cases were needed to compare the findings across companies and enable analytical generalisations to be developed in relation to web based environmental communication.

5.5 Data Collection

5.5.1 Overview

To address the first research theme developed in section 4.4, it was necessary to collect data on the extent to which the web is used for environmental communication. Managerial perceptions and company documents were also required to identify the factors that affect web based environmental communication and to address the other research themes. Multiple data collection methods were therefore required.

The data were collected through website monitoring, interviews and documentary analysis. These multiple sources of evidence allowed the data to be triangulated. Triangulation increases the likelihood that valid conclusions will be drawn from the cases and enhances the credibility of the research process (Yin, 2003a). Website monitoring provided a basis for seeking corporate views on web based environmental communication. These views were cross-checked in some instances through documentary evidence.

Data collection was guided by the research model developed in section 4.4. In line with the principles of case study research, there was also the possibility that specific findings from the field could be found that would extend this model. Table 5.1 shows the data collection process for this study.

In order to select suitable company cases, the general research phase involved a review of web based environmental communication in the Australian Minerals industry. An unstructured interview with the MCA’s sustainable development officer was conducted to determine the appropriateness of the minerals industry for investigation and the environmental communication practices of companies in the industry. Reports related to the minerals industry were also accessed. This approach is consistent with the recommendations of Adams and Laing (2000), who suggest that researchers initially seek to understand the industry in which the companies subject to investigation operate.
<table>
<thead>
<tr>
<th>Research Phase</th>
<th>Methods</th>
</tr>
</thead>
<tbody>
<tr>
<td>General (July 2003– December 2003)</td>
<td>• Unstructured interview with the MCA’s sustainable development officer.</td>
</tr>
<tr>
<td></td>
<td>• Documents related to the minerals industry accessed.</td>
</tr>
<tr>
<td></td>
<td>• General website monitoring undertaken at two different time periods.</td>
</tr>
<tr>
<td>Company Specific (January 2004–February 2005)</td>
<td>• Longitudinal website monitoring.</td>
</tr>
<tr>
<td></td>
<td>• Documents related to three companies accessed.</td>
</tr>
<tr>
<td></td>
<td>• Semi-structured interviews held in three different stages.</td>
</tr>
</tbody>
</table>

Table 5.1: The data collection phases for this study

The websites of the 14 mining companies associated with the Australian minerals industry were monitored at two different periods using the Media Richness Framework. This process is referred to as general website monitoring. Companies that were extensively involved in communicating environmental issues through their website were then selected for an in-depth study in the company specific stage. This approach accords with the arguments of Adams (2002), who suggests that researchers engage with the practice by focusing on companies undertaking social and environmental reporting. Such research can provide useful insights into the enabling conditions and constraints for current practices.

Three companies were selected for the second research phase on the basis of the general website monitoring findings. The environmental personnel of each of the companies were formally contacted in December 2003. Details of the research project and associated ethical considerations were provided and access to all three organisations was successfully arranged. Regular monitoring of the websites (referred to as longitudinal website monitoring), semi-structured interviews undertaken at three different stages and documentary analyses were used to collect data in the company specific stage.

5.5.2 Website monitoring

This study posits that website monitoring has to focus on the communication potential of the web in order to assess the extent of web usage. It is further argued that web based

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32 Further details on selection of cases for this study are provided in the next chapter.
data has to be captured on a longitudinal basis in order to obtain a comprehensive understanding of current practices.

The literature on web based environmental communication, discussed in section 3.5, indicates that, with the exception of the studies identified in section 3.5.2, the research methods used to analyse environmental information on websites in a majority of studies are akin to the content analytic methods used in environmental reporting studies of conventional print media. Evaluations of the communication potential of the web have been limited to either an acknowledgement or ad hoc assessment of the communication features of websites. As discussed in section 3.3, environmental communication has evolved over time and the web can potentially extend the capabilities offered by traditional print media. Thus, any assessment of the extent to which the web is utilised for environmental communication has to consider the use of these capabilities.

Given the differences between conventional print media disclosure and web based environmental communication, new approaches need to be developed to analyse environmental information on websites. Researchers therefore need to move beyond analysing disclosure on websites. The extent to which its communication potential is used in practice needs to be assessed. The Media Richness Framework provided a basis for assessing the communication potential of the web.

Sangster and Tyrrall (2004) highlight that academic theory and research practice have lagged behind developments in the adoption of web technology. Their insights into web based research indicate that the web is in a constant state of flux and that there is a pressing need for research that can capture and explain rapidly changing phenomena. The authors highlight that such research has to move beyond the quantitative assessment of websites and obtain qualitative insights into current practices. In addition, Cooper (2003) contends that website analysis should be conducted on a longitudinal basis to capture the potential for rapid information changes on websites.

As discussed in section 2.5.4, some of the prior studies on environmental reporting through conventional print media have been longitudinal (Guthrie & Parker, 1989; Gray et al., 1995; Deegan & Gordon, 1996; Buhr, 1998; Savage et al., 2002; Deegan et al., 2002; Campbell, 2003, 2004; Campbell et al., 2003). These studies have provided useful insights into specific trends in reporting. This suggests that longitudinal studies have the
potential to be informative and extend our current understanding of communication practices.

Section 3.5.2 highlighted that, with the exception of studies by Adams and Frost (2004) and Unerman and Bennett (2004), most of the research into web based environmental communication has been cross-sectional in design. These studies merely provide a snapshot of present practices. They cannot account for the dynamic nature of information dissemination through the web to show how environmental disclosure on websites can be changed or updated within a short time. Longitudinal studies are needed to capture the dynamic nature of information dissemination on the web.

### 5.5.2.1 General Website Monitoring

General website monitoring was undertaken for two weeks at two different time periods. Initial monitoring was performed in July 2003 and another evaluation was undertaken in November 2003. This sought to identify websites where information changed rapidly.

Regular monitoring of websites occurred in the company specific phase of the research. Monitoring time depended on the extent of environmental information communicated on the website and ranged from 30 minutes to two hours.

Website monitoring was not merely limited to the company’s homepage and the pages on social and environmental/sustainability. Given that certain environmental issues could be communicated along with other corporate issues via media releases, contact details, publications and presentations, these sections of the website were also accessed.

Remaining sections of the website were also briefly accessed to check whether environmental issues were communicated within them.

Website monitoring was informed by the Media Richness Framework developed in section 3.4. The framework was operationalised through the establishment of a checklist for evaluating the potential for environmental communication offered by the web medium. This checklist is shown at Figure 5.1.
Figure 5.1: Criteria for analysing the potential use of the web for communicating environmental issues

**Immediacy**
1. Is there regular updating of environmental information?
   □ Yes □ No
2. Are details provided on when environmental information was last updated?
   □ Yes □ No
3. Are mechanisms available to indicate that new environmental information has been added to the website?
   □ Yes □ No
4. Is there evidence to suggest that companies are utilising webcasts for communicating environmental information?
   □ Yes □ No

**Multiple Cues**
5. Which of the following tools are available to improve presentation of environmental information on the website:
   □ Graphics □ Animation □ Multimedia □ Others

**Language Variety**
6. Are the following hyperlinks available:
   □ Internal □ External
7. Are pop-up and pull-down menus available?
   □ Yes □ No
8. Are hyperlinks/menus available allowing stakeholders to choose the level of detail – summarised versus detailed information?
   □ Yes □ No
9. Is there integration of information through key hyperlinks on webpages?
   □ Yes □ No
10. Which file format is used for social and environmental reports?
    □ HTML □ PDF □ Other (Specify)
11. Are social and environmental reports available in different languages?
    □ Yes □ No
12. Are social and environmental reports presented as a web portal?
    □ Yes □ No

**Personal Source**
13. Are hyperlinks/menus used to provide specific customised information to different stakeholders?
    □ Yes □ No
14. Are push based mechanisms such as email alerts available?
    □ Yes □ No

**Multiple Addressibility**
15. Is environmental information accessible to all stakeholders?
    □ Yes □ No

**Externally Recordable**
16. Is archived environmental information available, such as, for example, social and environmental reports for multiple years?
    □ Yes □ No
17. Can stakeholders download and print social and environmental reports?
    □ Yes □ No
18. Does the website use facilities such as a hit counter and electronic guestbook to track how many stakeholders access environmental information?
    □ Yes □ No

**Computer Processable Memory**
19. Are the following available to assist in navigating the website:
    □ Search engines □ Sitemaps □ Menu based contents list □ Other navigational tools
20. Are analytical tools available for stakeholders to manipulate environmental information?
    □ Yes □ No

**Concurrency**
21. Are any of the following available:
    □ Email provisions □ Feedback forms □ Electronic surveys □ Discussion Fora
    □ Bulletin Boards □ Chatrooms
    □ Other means to facilitate interaction with stakeholders
The immediacy aspect of web based environmental communication was explored through evidence of the regular disclosure of environmental information on the website. This assessment involved establishing the recency of environmental information. For instance, recent social and environmental reports or latest media releases provided indications of an increasing use of the immediacy feature. Any change observed in the environmental information during the second general website monitoring period also provided indications of the immediacy of information. Moreover, details on when an environmentally related webpage was updated or indications of new environmental information being added to a website provided insights into the extent of use of the immediacy feature. Webcasts could also provide indications of timely communication.

Multiple cues were identified through the assessment of the tools available on websites to enhance presentation. Graphics, animation and multimedia features (audio and video clips) enhance presentation on the web. Webcasts also provide evidence of multiple cues as they usually incorporate audio and video technologies.

Language variety was established through an investigation of the different mechanisms available on a website to organise information and improve understandability. Evidence was sought via an examination of hyperlinks, menus and different report formats on each website. Hyperlinks can be both internal (within a webpage) and external (to another website). Pop-up and pull-down menus can also be used. Both summarised and detailed information can also be made available through hyperlinks and menus. Further, hyperlinks and menus can be used to integrate vital information. File formats can include portable document format (PDF) and hypertext mark-up language (HTML). Reports can also be provided in different languages. Web portals for specific reports can be used to organise environmental information.

Hyperlinks and menus can also enable a personal source for stakeholders by providing customised information based on the needs of different stakeholders. Thus, evidence of hyperlinks and menus showing environmental information for each stakeholder was sought. Email alerts can also be used to push environmental information to multiple stakeholders. The use of this feature was also assessed.

Multiple addressability was explored through evidence of the accessibility of the website to numerous stakeholders. This assessment involved investigating whether
passwords or other mechanisms were used to restrict user access and impede mass communication.

The externally recordable feature focuses on tools that enable information to be amended easily and a record of the communication to be kept. A record of environmental information can be provided through archived information, and users of a website may have the capacity to download and print past and current information. The availability of such mechanisms on websites was investigated.

Website use by stakeholders can be recorded with hit counters, electronic guestbooks or tracking software. The use of tracking software by companies cannot be determined by merely analysing websites. Corporate personnel need to be questioned regarding the use of tracking software by the company. Hit counters and electronic guestbooks are often the only tools used on a website that can provide a record of stakeholder use of the website. However, absence of these tools does not imply that these stakeholder tracing mechanisms are not used by companies. It merely indicates that companies are not willing to make such information available on their website.

Computer processable memory was investigated through a focus on tools that enable the search and analysis of information. The availability of search engines, site maps and menu based contents lists on each website was assessed. Analytical tools can also be used by stakeholders to manipulate environmental information based on their different needs, and evidence of this was also sought.

Concurrency was explored through a focus on the various ways in which interaction with stakeholders was facilitated by the website. Thus, the use of emails, automatic feedback forms, electronic surveys and other mechanisms for facilitating interaction with stakeholders was investigated. Two-way interaction through the web is also possible through discussion fora, bulletin boards and chatrooms, and evidence of these on websites was investigated.

The general website monitoring was conducted to identify specific company practices suitable for examination in the second phase. Three companies were identified from this phase. Whilst such monitoring did provide some indication of the present practice of web based environmental communication, an in-depth study on a longitudinal basis was
needed to provide useful insights into current practices in the industry. For instance, general website monitoring provided limited scope for an assessment of immediacy. These features were explored in further depth in the second stage of this research.

5.5.2.2 Longitudinal Website Monitoring

The longitudinal research phase involved the monitoring of websites on a daily basis for one year. De Vaus (2001) indicates that longitudinal studies measure change over time by collecting data over at least two time points. Whilst the time period for longitudinal web based environmental communication studies differs from the multiple years studies for print media, both forms of analysis 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 potential information changes on websites in one year can be quite extensive, providing scope for a detailed analysis (Sangster & Tyrrall, 2004).

The longitudinal website monitoring undertaken in this study represents the development of a new approach to studying web based environmental communication. This approach extended beyond the general website monitoring undertaken initially in this study and required a continuous examination of web based environmental communication. Adams and Frost (2004) undertook web based environmental communication monitoring on a three-monthly basis and found useful insights into current practices. This study adds to the literature through its emphasis on the daily examination of corporate websites to capture the intricacies of web based environmental communication.

On 31 December 2003, the overall contents of each company’s website in relation to environmental information were recorded. This activity involved recording the structure of each website, clearly highlighting every hyperlink and menu on the website. The entire environmental content of each website was also printed and filed. This information provided the basis for examining any subsequent changes made to the website.

The websites of the three companies were monitored daily in the year 2004 in order to capture the contemporary communication of environmental information. The Media
Richness Framework features operationalised in section 5.5.2.1 also guided the longitudinal website monitoring.

Change detection software (http://www.changedetection.com/monitor.html) was used to monitor any changes occurring on the websites. This software has the ability to detect changes on a website and sends an email to the person requesting the monitoring whenever a change has occurred. The researcher tested this software initially on the website of the School of Business and Information Management33 at the Australian National University, a website where information is updated on a regular basis. Every change made to this website was identified by this software.

The change detection monitor software was used to monitor the entire website of the companies. The uniform resource locator of each company’s website was used to identify the webpage to be monitored. Whenever a specific change took place on any section of a company’s website, an email was automatically sent to the researcher. If the change included social and environmental issues, the file was used to record the relevant details. The actual contents displayed on these websites were printed and stored in the file. Moreover, 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 program. A 100 per cent accuracy rate was recorded from this process.

5.5.3 Documentary evidence

Documents provided a useful data source in the first research phase. Given the focus of this study on a particular industry, a contextual background was needed and documents provided such information. Documents related to the Australian minerals industry provided insights into the critical importance of environmental issues, stakeholders and environmental communication in this industry.

33 This school was split into two schools; the researcher is now a member of the School of Accounting and Business Information Systems.
Key documents were also accessed in the second phase of the research\(^{34}\). These included information related to each company’s general background, corporate social and environmental issues and their environmental communication practice.

Corporate annual reports and social and environmental reports, which were available on websites for the periods 2001 to 2004, provided useful insights into the subject companies. Environmental policies and standards and other publicly available information related to the companies’ environmental issues, such as media releases (usually available on the corporate website) and emails to stakeholders, were also studied. Proceedings of the annual sustainable development conference of the MCA that related to the three companies were accessed. As the website monitoring and interviews were primarily related to 2004 operations, documents related to successive years were only accessed if they had a major impact on the research findings.

These documents provided a context for the research process. They enabled an understanding of corporate structure and activities to be gained as well as the pertinent social and environmental issues associated with a particular company to be identified. By providing company specific information, they also assisted in the development of interview questions. In some instances, data collected through the website monitoring and interviews could be corroborated by the documentary material.

\(5.5.4\) Interviews

An interview is essentially a dialogue conducted in a relatively informal way that is based on key themes and where knowledge is believed to be situational and contextual (Mason, 1996). The research was focused on a particular context—specific mining companies extensively involved in web based environmental communication—and aimed to establish analytical generalisations. Managerial perceptions of web based environmental communication were considered a source for developing these analytical generalisations (situational knowledge). While the study was guided by particular themes, the research approach needed to be flexible enough to allow other issues to emerge. Interviews were therefore considered an appropriate data collection method as they enable engagement with practitioners and allow an in-depth discussion of critical issues that affect web based environmental communication.

\(^{34}\) A list of specific documents accessed for each company is provided in chapters seven to nine.
O’Donovan (2002a) points out that most social and environmental reporting research to date has focused on the ex post analysis of annual reports. Very few studies have moved beyond the content analysis of annual reports and consulted personnel in charge of environmental communication in an organisation regarding their past and present environmental communication practices. This observation is also evident from the web based environmental communication literature discussed in section 3.5.1. There is a need to complement the website monitoring with methods such as interviews to seek managerial perceptions on web based environmental communication.

While only a few studies on social and environmental reporting have used interviews (as discussed in section 2.5.4), they nonetheless highlight that this method is useful for obtaining in-depth insights regarding current practice (Gray et al., 1997; Cumming, 2001; Owen et al., 2001, O’Dwyer, 2001, 2002, O’Donovan, 2002a). Adams and Frost (2004) provide limited evidence of web based environmental communication studies that have used interviews to gain further insights into current practices. This study recognises the potential that interviews can offer in obtaining in-depth insights about a particular phenomenon. Thus, interviews were used in this study to identify managerial perceptions on web based environmental communication.

5.5.4.1 The Interview Process

An ethical clearance for conducting the interviews was obtained from the research ethics committee at the Australian National University (ANU). Ethical consent forms were signed at the initial interviews.

The initial unstructured interview with the MCA’s sustainable development officer was followed by semi-structured interviews with corporate personnel in the company specific phase. Interviews were initially held (February to March 2004) with the environmental/sustainable development manager of each company. These interviews were general in nature and primarily sought to gain an understanding of the role of the corporate website in the company’s overall environmental communication process. The initial contact was used to establish relationships with other practitioners for further interviews. The emphasis was on identifying personnel who had a critical role in web based environmental communication within the company.
The second and third series of the interviews involved the same individuals from the initial phase as well as communication personnel. Communications staff were identified in the initial interviews as the other key personnel involved in a company’s web based environmental communication practice. These interviews were specific and sought to obtain an in-depth understanding of the current web based environmental communication practice of the companies. The second series of the interviews was held between May and July 2004 and the third series was held between January and February 2005. A total of 16 interviews were held at the three corporations during the company specific research phase\(^{35}\).

\subsection*{5.5.4.2 Conduct of Interviews}

The researcher held mock interviews with colleagues prior to the commencing each stage of the interview. This activity allowed pilot testing of all questions and at the same time allowed the researcher to get advice on appropriate interviewing techniques.

Interviews were held at the office of the interviewees. The interviewees were briefed on the purpose of the interview. At the beginning of each interview, the interviewees were reminded that their identity as well as the company’s identity would be kept confidential\(^{36}\). The interviewees were invited at the outset of each interview to seek further clarification of any questions or issues. At the conclusion of each interview, the interviewees were invited to address any other relevant issues not already covered.

All interviews were digitally recorded with the consent of each interviewee. No interviewee objected to having the conversation recorded. Each interviewee was advised that they could cease the audio recording at any point in the interview.

The interviews were semi-structured. A structured list of similar questions was used for all the companies. However, probes as well as specific questions related to an individual company’s environmental communication practice were also utilised. The interviews were transcribed and provided to all interviewees for confirmation of their accuracy.

\(^{35}\) Specific details on the interviewees of each company are discussed in chapters seven to nine.

\(^{36}\) The information sheet regarding the ethics approval for the research is provided in Appendix One.
The interview questions were based on the theoretical perspective adopted for the study. The interviews were conducted in three stages so that an in-depth understanding of web based environmental communication could be obtained over time and the findings of the longitudinal website monitoring could be corroborated with interviews. The initial series of interviews lasted between 45 minutes to one hour and 15 minutes whilst the second and third interviews lasted between one to two hours.

### 5.5.4.3 The First Interviews

The initial interviews sought general views on web based environmental communication. Personnel in charge of the web based environmental communication practice of each company were identified. Figure 5.2 provides the list of questions used for this interview phase.

<table>
<thead>
<tr>
<th>Question</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. What is your position within the company? What are your responsibilities in relation to environmental issues and for how long have you had this role in the company?</td>
</tr>
<tr>
<td>2. Who do you consider to be the key stakeholders of the company in relation to its environmental impacts and how do you manage these stakeholders?</td>
</tr>
<tr>
<td>3. What are some of the management motivations for communicating environmental information to these stakeholders?</td>
</tr>
<tr>
<td>4. What are the various media used for communicating environmental information to stakeholders?</td>
</tr>
<tr>
<td>5. What role does the corporate website have in the organisation’s environmental communication practice?</td>
</tr>
<tr>
<td>6. Who decides whether environmental information should be communicated on the company website, what type of information should be communicated and how this should be communicated? What are the responsibilities of staff involved in web based environmental communication?</td>
</tr>
<tr>
<td>7. What do you think are the benefits to the organisation from using the web for communicating environmental information to stakeholders?</td>
</tr>
<tr>
<td>8. What do you think are the challenges for the organisation from using the web for communicating environmental information to stakeholders?</td>
</tr>
<tr>
<td>9. Do you have any additional comments in relation to the issues we have raised in this interview?</td>
</tr>
</tbody>
</table>

**Figure 5.2: The initial interview questions**

Rapport was developed by a question seeking information on the position of the interviewee. Initial questions concerned environmental communication at a general level. This was to gain an understanding of the overall practice of environmental
communication in the organisation. These questions were based on the literature review and an analysis of documents relating to each company’s environmental communication practice. Details of the organisation’s stakeholders, motivations for environmental communication and the media used for communication were sought. These questions enabled the link between environmental communication and the medium used for facilitating such a process to be established. They also provided a basis for probing the internal organisational factors and external stakeholder influences that would be explored in subsequent interviews.

Towards the end of the interview, the role of the web in the environmental communication practice and the web based environmental communication process of the organisation were established. Finally, the benefits of, and challenges to, web based communication were sought to develop initial insights into the factors affecting web based environmental communication.

5.5.4.4 The Second Interviews

The second series of interviews addressed issues related to web based environmental communication directly. Specific questions were developed to address the research themes associated with the second research objective, which, as discussed in section 4.4, sought to establish the factors influencing web based environmental communication. The interviewees were not only probed on these matters but also had the opportunity to raise other significant issues that had an impact on the use of the web for environmental communication. The questions in this interview were used as a general guide and probes were often used following the responses of each interviewee. The general website analysis findings in relation to a particular company and the preliminary findings of the longitudinal website analysis guided the probes. Many issues raised in the second interviews were also discussed in further detail in the last interviews. Figure 5.3 lists the questions used for this interview.

Rapport was developed in the second interview by establishing the job responsibilities of each interviewee. This identified the role of the interviewee in environmental communication generally and web based environmental communication specifically.
The interviewees were initially asked about how the web had changed the process of communicating environmental issues to stakeholders. This question identified their level of awareness regarding the communication potential of the web. Their responses were then related to their web based environmental communication requirements. This identified the degree of alignment between the perceived benefits of the web and management’s communication needs.

The impact of contextual influences on web based environmental communication practice was then assessed. The interviewees were asked about the impact of technological limitations and economic considerations on web based environmental communication. Internal organisational factors were assessed through probes about management motivations for web based environmental communication and the strategic considerations involved in web based environmental communication. These assisted in identifying corporate attitudes and strategic posture in relation to web based environmental communication. External stakeholder influences on web based environmental communication were also explored. The final question in the interview

<table>
<thead>
<tr>
<th>Question</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>What is your position here and for how long have you been with the company?</td>
</tr>
<tr>
<td>2.</td>
<td>What are your main job responsibilities? Who do you report to?</td>
</tr>
<tr>
<td>3.</td>
<td>What is your role in relation to the environmental communication practice of the organisation? How about the World Wide Web (web) environmental communication practice?</td>
</tr>
<tr>
<td>4.</td>
<td>In your opinion, how has the web changed the process of communicating environmental information to stakeholders?</td>
</tr>
<tr>
<td>5.</td>
<td>How is the web used to address the environmental communication requirements of the company?</td>
</tr>
<tr>
<td>6.</td>
<td>What impact do limitations of web based technologies have on the web based environmental communication practice of the company?</td>
</tr>
<tr>
<td>7.</td>
<td>What impact do economic considerations have on the web based environmental communication practice of the company?</td>
</tr>
<tr>
<td>8.</td>
<td>What are some of the management motivations for communicating environmental information on the web?</td>
</tr>
<tr>
<td>9.</td>
<td>Are there any strategic considerations for communicating environmental information through the web?</td>
</tr>
<tr>
<td>10.</td>
<td>Do stakeholders influence the company’s web environmental based communication? How?</td>
</tr>
<tr>
<td>11.</td>
<td>Are there any other issues related to this interview that you would like to raise?</td>
</tr>
</tbody>
</table>

Figure 5.3: Questions used in the second series of interviews
was used to identify other emerging themes related to web based environmental communication.

5.5.4.5 The Third Interviews

The final series of interviews sought to address issues related to the use of the web for environmental communication for each company based on the findings of the general and longitudinal website analysis and prior interviews. Figure 5.4 identifies the general questions used for the final interview.

Figure 5.4: Final interview questions

1. Describe the web based environmental communication practice of the company over the last year and highlight the factors that contribute to this practice.

2. What are some of the ways in which the company is considering utilising the web for environmental communication in the future?

3. Are there any other issues in relation to this interview that you would like to raise?

The interviews commenced with questions relating the web based environmental communication practice of the company (ascertained through the website analysis) to specific factors. The emphasis was on both the use and non-usage of the web in specific contexts. A number of probes were used to gain insight into the factors affecting web based environmental communication.

Significant changes to the web based environmental communication practice were ascertained from the longitudinal website monitoring. This interview was used to identify the factors that caused these changes.

The significance of the factors, identified from prior interviews, in explaining current web based environmental communication practices was then established. Some factors could have become less critical while new factors may have become prominent.
The second series of interviews provided initial insights into the extent to which management’s web based environmental communication needs affected the use of web communication. The third interview allowed these findings to be verified. It also sought to establish why certain communication requirements were not needed by a company and, therefore, led to the limited use of certain web based features. For instance, if interaction through the web was not a critical need for a company and led to limited use of the personal source and concurrency capabilities on its website, the reasons for this could be obtained.

The extent to which management addressed the technological limitations of the web, which were identified from the second series of interviews, was also sought. This aimed to identify the impact such limitations had on the use of the web for environmental communication. Economic considerations, internal organisational issues and external stakeholder influences were discussed further in this interview. Themes that emerged from earlier interviews were also probed. Emphasis was given to the impact of these factors on both enabling as well as constraining web based environmental communication over time.

The second part of the interview concerned the potential future web based environmental communication practice of each company. This aimed to determine whether changes to the company’s web based environmental communication practice were possible in the future and to identify possible factors that could cause these changes.

A final opportunity for addressing any critical issues not discussed previously was also provided. In addition to probes about the various contextual influences initially developed in theory or identified from the field that were supported in the earlier interviews, other significant factors that could explain web based environmental communication were sought. The intention was to capture all the possible factors that could affect web based environmental communication in relation to each case.

5.6 Data Analysis

Pattern matching was utilised as the specific case study analytical research strategy (Yin, 2003a). Patterns reflecting the themes based on the research model were observed
through website monitoring, interviews and documentary evidence, and any rival explanations that could modify the initial research model were also addressed. This process enabled the salient factors that contribute to web based environmental communication to be taken into account.

The data for this research were initially analysed on an individual case basis before a cross-case synthesis (Yin, 2003a) was conducted. The cross-case analysis was undertaken because the intention of this research was to develop analytical generalisations of the factors that contribute towards web based environmental communication. Therefore, the themes of the research were applied to all three cases consistently. The factors that were common to all the companies provided ‘stronger’ analytical generalisations than those found relevant in only one or two companies.

5.6.1 Analysis of websites

Companies that used the communication potential of the web, analysed on the basis of the Media Richness Framework, were identified in the general website monitoring. This revealed the extent of overall web usage in the Australian minerals industry. However, evidence of how the companies ranked in relation to Media Richness Framework features was not sought because the goal of the data analysis from the general website monitoring was to select specific companies for the second phase of the research. The intention was not to compare these companies’ web based environmental communication practice. Such comparisons would provide crude measures as they would be restricted to a cross-sectional analysis of web usage. They would be unable to capture all the salient factors that influence web based environmental communication. An in-depth analysis of web based environmental communication was required for this study, and this was accomplished in the second phase of the study.

In relation to the longitudinal website monitoring, all information gathered during the one-year period was analysed on an ongoing basis. The analysis of websites was organised on the basis of the initial structure (31 December 2003) and changes made during the year (until 31 December 2004). However, a postscript stage identified any significant changes to the website in relation to environmental issues beyond the period of analysis. The discussion of environmental disclosure in section 2.5.1 was used to identify the environmental content on a website. Thus, the emphasis was on
environment related matters on a website (rather than specific social issues). This resulted in issues such as general environmental information, environmental performance, initiatives, collaborations and awards, and incidents being analysed.

The Media Richness Framework features—immediacy, language variety, multiple cues, personal source, multiple addressability, externally recordable, computer processable memory and concurrency—were explored in the longitudinal website monitoring. These provided a basis for analysing the extent to which the web was utilised for environmental communication over time.

The extent to which these Media Richness Framework features were utilised by each company as observed during the general and longitudinal website analyses was ranked in terms of a high, medium and low scale. These represented the extensive, moderate or limited usage of a characteristic. Such a classification assisted the cross-case analysis by providing a basis for comparing each company’s use of the web for environmental communication.

5.6.2 Analysis of documents

The documentary data were mainly used for interpretation purposes. Neither a content analysis nor a comparison of environmental disclosure between print and web based media was undertaken. As indicated in Chapter One, the primary aim of this research is to explore web based environmental communication practices of companies in the Australian minerals industry. Documents merely provided background information and, in some instances, corroborated the other data collected in the study.

In some instances, the interview data were verified and developed further by cross-reference to various documents. For example, when an interviewee identified the company’s key stakeholders, this could be verified by an analysis of the social and environmental reports of that company for issues related to stakeholders. This cross-referencing provided information on who the stakeholders were and how they were managed.
5.6.3 Analysis of interview data

Following transcription, all the interview data were analysed through the Nvivo software program. This data analysis software is useful for organising and managing interview data (Anderson-Gough, 2004; Seale, 2005).

Codes were developed by the researcher for use in Nvivo on the basis of the research themes developed in section 4.4. Codes are data-labelling devices that enable data reduction and retrieval (Miles & Huberman, 1994). In effect, ‘coding is analysis’ (Miles & Huberman, 1994:56). It allows the researcher to analyse large amounts of data.

<table>
<thead>
<tr>
<th>Code</th>
<th>Terms that could be identified from the interview data</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Timeliness</strong></td>
<td>Timely, Continuous, Periodic, Ad hoc, Ongoing.</td>
</tr>
<tr>
<td><strong>Presentation and Organisation</strong></td>
<td>Pictures, Diagrams, Presentation, Graphics, Multimedia, Animation, Audio, Video, Organisation, Information Storage,</td>
</tr>
<tr>
<td></td>
<td>Hyperlinks, Menus, Web Portals, Integration, Summary versus Detailed Information, Disaggregated Information, Printing</td>
</tr>
<tr>
<td></td>
<td>Capability, Downloading Capability, Log Analysis Software, Archived Information, Past Information, Dynamic Nature,</td>
</tr>
<tr>
<td></td>
<td>Amendments, Tracking, Search Engine, Sitemap, Menu based Contents, Analytical Tools, Electronic Tools, Computerised</td>
</tr>
<tr>
<td></td>
<td>Tools, Personalisation, Customisation, Organisation.</td>
</tr>
<tr>
<td><strong>Accessibility</strong></td>
<td>Availability, Mass Communication, Global Reach, Multiple Persons, Numerous Stakeholders.</td>
</tr>
<tr>
<td><strong>Interaction</strong></td>
<td>Email Alerts, Specific information for stakeholders, Feedback, Interactive, Engagement, Two-way Relationship.</td>
</tr>
<tr>
<td><strong>Security Issues</strong></td>
<td>Hacking, Viruses, Firewalls, Denial of Service, Network Intrusions.</td>
</tr>
<tr>
<td><strong>Website Design and Promotion</strong></td>
<td>Web Design, User Friendly, Website Advertising, Website Promotion, Clear Links.</td>
</tr>
<tr>
<td><strong>Information Authenticity</strong></td>
<td>Reliability, Confidentiality, Authenticity, Credibility.</td>
</tr>
<tr>
<td><strong>Information Overload</strong></td>
<td>Excessive Information, Too much Information, Overload.</td>
</tr>
<tr>
<td><strong>Economic Factors</strong></td>
<td>Economic Benefit, Cost Benefit Analysis, Savings, Economical.</td>
</tr>
<tr>
<td><strong>Internal Organisational Factors</strong></td>
<td>Issues related to environment, stakeholders and communication medium, Technological Expertise, Strategic Use,</td>
</tr>
<tr>
<td></td>
<td>Leadership, Competitive Advantage.</td>
</tr>
<tr>
<td><strong>External Stakeholder Influences</strong></td>
<td>Issues related to stakeholders, Stakeholder Demand, Stakeholder Preference, Stakeholder Competence.</td>
</tr>
</tbody>
</table>

Table 5.2: Codes of critical factors that could be identified from the interview data
Nvivo was used to organise and manage the codes. The emphasis was on searching for patterns in the interview data that reflected the theoretical constructs used in the study. Thus, codes representing management’s web based environmental communication needs, the technological limitations of the web, economic factors, internal organisational factors and external stakeholder influences were developed. Table 5.2 highlights the key terms that guided the recognition of these factors in the interview data.

As highlighted in sections 5.5.4.3 to 5.5.4.5, most of the interview questions were designed to capture the various factors identified from the literature that can affect web based environmental communication. However, the codes were not limited to these factors but included any issues raised by interviewees in response to more general questions. It was possible that certain issues raised in the interviews did not relate to the theoretical codes. These issues were initially coded and probed in later interviews. For instance, some codes were developed from the last question of the interview, where interviewees had the opportunity to raise other specific issues not covered in the interview. These informed future interview questions so that rival explanations could also be addressed through the interview process.

The data related to each code (including emerging themes) for a particular company were stored as a separate file in Nvivo. These data were then triangulated with the evidence from the other data collection methods—the website monitoring and documents.

Communication needs were classified as either critical or non-critical to establish the importance of each company’s need for web based environmental communication. Contextual influences were identified on the basis of their enhancement, constraint or non-effect on web based environmental communication needs. For instance, certain contextual influences enhanced certain communication needs yet at the same time constrained others. Some contextual influences had no effect on certain communication needs.

As mentioned earlier, a cross-case analysis was also undertaken. The classification of web based environmental communication needs and contextual influences provided a basis for comparing each company’s practice. These were used to develop analytical
generalisations of the extent of web usage and the factors that influence web based environmental communication.

5.7 Research Soundness

Yin (2003a) suggests applying the same principles used in scientific research to case study research in order to improve its rigour. These encapsulate validity—construct, internal and external validity—and reliability issues. Scapens (2004) refers to these principles in accounting research as contextual validity and procedural reliability.

The construct validity in case study research is enhanced by the use of multiple sources of evidence, the establishment of a clear chain of evidence and having key informants review draft case study reports. In this research, data were triangulated through the use of a variety of sources—website monitoring, interviews and documents. A systematic approach to data collection—using general and company specific phases—produced a clear chain of evidence. Finally, all transcribed interviews were provided to every interviewee for review shortly after each interview. A summary of key findings arising from this research was also provided to key personnel in each organisation in order to verify their accuracy.

Internal validity in case study research is improved by data analysis techniques specific to this form of research. The first research objective was addressed through an analysis of websites based on Media Richness Framework features. The second research objective was addressed through a coded analysis of the interview data. Other emerging factors were also coded. Documents corroborated the findings of the website monitoring and interviews in some instances. This approach accords with the pattern matching strategy advocated for case study research, which suggests that empirical data should be analysed through patterns reflecting the theoretical constructs of the study.

External validity in case study research relates to research design. The emphasis is on whether a single case or multiple cases have been used and the logic used to justify this selection. The multiple case study design used in this research enabled replication and could be used to derive theoretical conclusions. Replication logic implies that analytical generalisations are developed through similar and contrasting findings across a number of cases.
Reliability in case study research is enhanced by the development of a case study protocol and a case study database. The former is a document outlining the research project and the steps to be undertaken to collect and analyse data in order to arrive at theoretical conclusions while the latter is a collection of all materials collected during the research. Both of these devices were utilised in this research.

A case study protocol was developed by documenting the data collection and analysis procedures outlined earlier in this chapter. The case study database was established by maintaining a filing system for all the data. Information related to the analysis of websites, the audio recordings of interviews, interview transcripts and their analysis and other relevant documents were stored in this file. All notebooks and papers containing the researcher’s observations and reflections were also retained in this file.

Prolonged engagement (see for example, Creswell, 2003) in the field—website monitoring and interviewing over a year—also enhanced the reliability of this research. Whilst data were not specifically collected and analysed beyond the collection period specified here, the researcher was alert to any events that occurred beyond this period that could have a significant impact on the research findings.

A postscript longitudinal website analysis was also undertaken. The change detection software continued to be utilised beyond the period of analysis for this study. However, unlike the analysis of websites during the data collection for this study, an in-depth analysis of a website was only undertaken if the changes on the website significantly affected the research findings. These findings would have led to unstructured interviews and an analysis of relevant documents.

Prolonged engagement ensured that the data gathered represented not a snapshot but an in-depth investigation over time of the factors influencing the web based environmental communication practice of each company. Additional findings that could significantly impact the results of the study were also considered, even if these were not prevalent in the longitudinal data collection period.
5.8 Case Study Compilation

This study used a multiple case report (Yin, 2003a) to present its findings. A multiple case report involves initially presenting individual cases before undertaking a cross-case analysis. The goal is to obtain an in-depth understanding of a particular case and utilise this understanding as the basis for comparing similar and contrasting findings across cases.

As discussed earlier, the analysis of websites of Australian mining companies was used to select specific companies as cases for the study. Specific details of these are provided in Chapter Six. Each case is then discussed as a separate chapter in this thesis. These chapters are followed by a chapter reporting the cross-case analysis.

A similar format is used for the multiple case chapters so that there is consistency across the three cases. Each chapter begins with a discussion of the data sources for a particular company and is followed by a description of the contextual background of that company. The various research themes are then addressed.

An overview of the web based environmental communication practice of the company provides a basis for assessing the extent of web usage through Media Richness Framework features (first research theme). The web based environmental communication practice of a company is discussed through data collected from the initial interview(s), documents and website analysis. The emphasis is on the role of the corporate website in the company’s environmental communication practice and the personnel and processes involved in web based environmental communication. The longitudinal website analysis is also presented. The general website analysis findings related to each company, in conjunction with the longitudinal website findings, are then used to ascertain the extent of web usage in each company.

Factors that contribute to the extent of use of the web are then discussed in relation to the other research themes. This process involves a discussion of management’s web based environmental communication needs, contextual influences and certain emerging themes identified from the field. Interviews and documents, which were supported by the website analysis findings, were used in the analysis.
A summary in each chapter highlights the salient factors that influence the extent of web usage for environmental communication in each company. The classification of the extent of web usage in relation to the Media Richness Framework, management’s web based environmental communication needs and contextual influences, as discussed in sections 5.6.1 and 5.6.3, summarise the situation in each case.

The cross-case analysis in Chapter Ten was facilitated through the use of display tables (Miles & Huberman, 1994). Research themes were compared across all three cases with the intent of establishing the extent to which each theme (including its subcategories) affected the web based environmental communication practice of each case. This enabled similar and contrasting findings across the cases to be highlighted, thereby promoting replication logic.

5.9 Methodological Limitations

A common criticism of case studies is that it is not possible to generalise from their findings. This misconception is based on the concept of statistical generalisation, whereby only statistically significant results obtained from large sample sizes are seen as representative of trends in the broader community. However, several proponents of case study research (Hagg & Hedlund, 1979; Yin, 2003a, 2003b; Berry & Otley, 2004; Scapens, 2004) have demonstrated how the theoretical conclusions (analytical generalisations) of case study research are generalisable and provide valuable insights into contemporary phenomena. In the current study, an understanding of the factors that contribute to the current adoption of the web will help companies identify the issues they need to consider when undertaking web based environmental communication (analytical generalisations).

Case studies have been criticised for lacking rigour (Yin, 2003a; Berry & Otley, 2004; Scapens, 2004). Case study research can also be regarded as difficult to undertake (Hagg & Hedlund, 1979; Yin, 2003a; Berry & Otley, 2004; Scapens, 2004). One has to be a skilful interviewer and interpreter of information, a confidence builder and a scholar in many different disciplines in order to undertake such research (Hagg & Hedlund, 1979). Yin (1984:26) states:

*Case study research is remarkably hard, even though case studies have been traditionally conceived to be ‘soft research’. Paradoxically, the ‘softer’ a research technique, the harder it is to do.*
The complexities of drawing boundaries around the subject matter and managing ethical relationships with participants can also be challenging (Scapens, 2004).

Several texts on case study research developed in recent times (see, for example, Yin, 2003a, 2003b) provide well-established methods for conducting this type of research. These usually describe specific tools for conducting case studies and offer a philosophical defence of the case study method. Validity and reliability issues were afforded close attention in this study.

Critics also argue that the interview method suffers from the personal bias and prejudice of the researcher (Creswell, 2003). There may also be difficulties and errors encountered in interpreting the views and responses of the interviewees (Silverman, 2001). These limitations were reduced in this research by having each interviewee review a transcript of his or her interview. A triangulation of methods was used to enhance the validity of the data collected for the study.

In accordance with the finding in the literature that web based environmental communication is not a well-established phenomenon in companies, a limited number of people within each company were found to have a major role in this practice. Thus, interviews were held only with those individuals in charge of environmental/sustainability issues within the organisation as well as those with a key role in web based communication.

The methods used for analysing websites had not been extensively developed in earlier research. This research, building on the work of Adams and Frost (2004), has attempted to develop methods for assessing websites over time using Media Richness Framework features. Such an approach, while unique, is also untested and requires validation in further studies before it can be accepted as an established method for website monitoring.

The documentary evidence for this research was limited to information which was publicly available, usually on corporate websites. Confidentiality concerns restricted access to internal documents, which could have provided further insights into web based environmental communication within a company.
5.10 Summary

The case study approach was the most appropriate research strategy for this thesis. This research seeks to explore a significant issue (web based environmental communication) that has received limited coverage in the literature, and attempts to explain the (multiple) factors that can contribute to the current adoption of the web for communicating environmental issues to stakeholders. Therefore, it is analytical generalisations that are vital for this study rather than statistical generalisations. An in-depth study of a specific context, companies in the Australian minerals industry, can provide an initial understanding of a complex phenomenon such as the web based environmental communication practice of corporations. Such analytical generalisations can provide potentially useful insights to both academics and practitioners that can inform further work in this area.

The case study research design guided the data collection and analysis in this study. Multiple methods, in the form of website monitoring, interviews and documentary evidence, were used to collect the data for this research. The data were analysed on an individual and cross-case basis through the pattern matching procedure. Moreover, established techniques for case study research were used for ensuring research soundness. Emphasis was also on the case study write-up and methodological limitations of this research.

The next five chapters present the results of this study. An overview of web based environmental communication in the Australian minerals industry is provided in the next chapter. The other chapters represent a multiple case report. Case studies of each company’s web based environmental communication practice are discussed in chapters seven to nine and a cross-case analysis is conducted in Chapter Ten.
Chapter Six: An overview of web based environmental communication in the Australian minerals industry

6.1 Introduction

This chapter is the first to report the findings from the data collected for this study; it focuses on the initial research phase. In order to address the central research question, the extent of web usage had to be ascertained. Accordingly, the first research theme was focused at a general level on an overview of the extent of web usage by companies in the Australian minerals industry. This provided the basis for the company specific phase of the research, the results of which are reported in the following chapters. This phase focused on the extent of web usage in specific companies and the factors which could explain this usage.

Section 6.2 provides details of the various companies associated with the Minerals Council of Australia (MCA), the industry association for mining companies in Australia. Initial insights into web based environmental communication in this industry are also discussed. Section 6.3 presents findings related to the general website monitoring. The websites of Australian mining companies were analysed at two different time periods according to the Media Richness Framework features. In order to obtain in-depth data in relation to specific web based environmental communication practices, the general website analysis was used as the basis for selecting three companies for the second phase of the study. This is reported in section 6.4.

6.2 Background

Twenty-seven organisations were associated with the MCA at the start of the data collection phase of this research (June 2003), but not all were mining companies. One was a law firm (Allens Arthur Robinson Group), two were accounting firms (PriceWaterhouse Coopers, KPMG) and several companies provided mining based services, such as mining engineering and specialised mining equipment production (Dyno Nobel Asia Pacific Ltd, Henry Walker Eltin, Orica Limited, P&H Minepro
Services, Roche Mining and Thiess Pty Ltd). Table 6.1 provides details of the mining corporations associated with the MCA.

<table>
<thead>
<tr>
<th>Corporation</th>
<th>Structure</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anglo Coal Ltd.</td>
<td>Multinational</td>
</tr>
<tr>
<td>AngloGold Ltd.</td>
<td>Multinational</td>
</tr>
<tr>
<td>Barrick Gold.</td>
<td>Multinational</td>
</tr>
<tr>
<td>BHP Billiton Ltd.</td>
<td>Multinational</td>
</tr>
<tr>
<td>Iluka resources Ltd.</td>
<td>Local</td>
</tr>
<tr>
<td>MIM Holdings</td>
<td>Local</td>
</tr>
<tr>
<td>Newcrest Mining Ltd.</td>
<td>Local</td>
</tr>
<tr>
<td>Newmont Mining Corporation</td>
<td>Multinational</td>
</tr>
<tr>
<td>Placer Dome Asia Pacific</td>
<td>Multinational</td>
</tr>
<tr>
<td>Pasminco</td>
<td>Local</td>
</tr>
<tr>
<td>Rio Tinto</td>
<td>Multinational</td>
</tr>
<tr>
<td>Robe River Mining Pty. Ltd</td>
<td>Subsidiary</td>
</tr>
<tr>
<td>Sons of Gwalia</td>
<td>Local</td>
</tr>
<tr>
<td>Ticor Ltd.</td>
<td>Local</td>
</tr>
<tr>
<td>Western Metals</td>
<td>Local</td>
</tr>
<tr>
<td>Worsley Alumina Pty. Ltd</td>
<td>Subsidiary</td>
</tr>
<tr>
<td>WMC Resources Ltd.</td>
<td>Local</td>
</tr>
<tr>
<td>Xtrata</td>
<td>Multinational</td>
</tr>
</tbody>
</table>

Table 6.1: Mining corporations associated with the MCA as at June 2003

As Table 6.1 indicates, the mining companies associated with the MCA are a mixture of multinational corporations (MNC) and local companies. Robe River Mining Co Pty Ltd and Worsley Alumina Pty Ltd are not listed companies as they are subsidiaries of Rio Tinto and BHP Billiton respectively.

An unstructured interview held with the sustainable development officer of the MCA provided initial local evidence of web based environmental communication. The views of the interviewee highlighted that the MCA was conscious of the evolving nature of environmental communication and the numerous benefits that the web can provide to corporations in the mining industry.

The MCA sustainable development officer also gave an example of a small company that had recently started communicating environmental issues as a result of encouragement from the industry association. This company solely used the web due to its cost-benefit advantages. Thus, this finding indicates that the use of the web can
prompt smaller companies that may not have undertaken environmental communication previously to engage in such a practice. The interviewee mentioned that the MCA supported the use of the web by its member companies for environmental communication. This anecdotal evidence provided at the outset of the data collection period highlights that companies in the Australian minerals industry can benefit from the use of the web for environmental communication.

<table>
<thead>
<tr>
<th>Company Name</th>
<th>Website address</th>
</tr>
</thead>
<tbody>
<tr>
<td>BHP Billiton Ltd.</td>
<td><a href="http://www.bhpbilliton.com/bb/home/home.jsp">http://www.bhpbilliton.com/bb/home/home.jsp</a></td>
</tr>
<tr>
<td>Newmont Mining Corporation</td>
<td><a href="http://www.newmont.com.au">http://www.newmont.com.au</a></td>
</tr>
<tr>
<td>Pasminco</td>
<td><a href="http://www.pasminco.com.au">http://www.pasminco.com.au</a></td>
</tr>
<tr>
<td>Placer Dome Asia Pacific</td>
<td><a href="http://www.placerdome.com/">http://www.placerdome.com/</a></td>
</tr>
<tr>
<td>Rio Tinto</td>
<td><a href="http://www.riotinto.com/">http://www.riotinto.com/</a></td>
</tr>
<tr>
<td>Sons of Gwalia</td>
<td><a href="http://www.sog.com.au">http://www.sog.com.au</a></td>
</tr>
<tr>
<td>WMC Resources Ltd.</td>
<td><a href="http://www.wmc.com/">http://www.wmc.com/</a></td>
</tr>
</tbody>
</table>

Table 6.2: Company websites analysed in this study: Accessed June - November 2003

Some changes occurred in the structure of certain local companies while this research was being conducted. One went into receivership and two were taken over by MNCs.

Four companies were eliminated from the general website analysis because they did not provide sufficient scope for an analysis of their website. These included the two subsidiaries, the company that went into receivership and one of the two companies taken over by a MNC. The subsidiaries were not included because they were not independent companies. They were part of major companies whose websites had
already been analysed. Moreover, the company that went into receivership did not have an updated website. One of the local companies was taken over during the second round of the general website analysis and its website was taken offline. Thus, its details were not included in the general website analysis. The other local company which was taken over was not eliminated from the analysis because it was taken over following the conclusion of the general and longitudinal website monitoring. Table 6.2 provides details of the 14 company websites analysed in this study.

6.3 General Website Analysis

The websites of the mining companies associated with the MCA were analysed for their communication of environmental information to stakeholders. As discussed, the Media Richness Framework guided the collection and analysis of the data.

6.3.1 Overview

All 14 companies had a separate section for environmental issues on their website. This finding signifies that these companies gave prominence to environmental issues through web based communication.

The titles for the environmental (or sustainability) section of the company websites can be classified into five categories. These are environment (or environmental management); community and the environment; social (or corporate) responsibility; health, safety, environment and community; and sustainability. This finding suggests that companies were integrating environmental information with other types of social information. However, the extent to which environmental information was communicated on a website was far more extensive than other types of social disclosure.

It was observed in the first round of the general website analysis that a particular local company had a range of environmental information communicated on its website. However, it was taken over during the second stage of the website analysis and its website was taken offline. Only its archived site existed on the multinational’s website at that time. The archived site appeared whenever the address for the local company’s website was typed. This situation persisted briefly until the local company’s website
was taken offline. Thus, the extensive range of environmental information communicated on its website was lost.

As expected, MNCs communicated environmental information on their global operations. However, Australian specific environmental information was not always accessible from some of these websites, highlighting that some MNCs provide aggregated environmental information on their website.

6.3.2 Immediacy

Table 6.3 illustrates that a rather disappointing feature of these websites was the lack of recency of environmental information. As discussed in section 5.5.2.2, immediacy was assessed through evidence of regular changes to the website. For instance, the availability of the latest social and environmental reports or media releases indicated an increasing use of the immediacy feature.

<table>
<thead>
<tr>
<th>Feature</th>
<th>No of companies</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Regular changes</td>
<td>7</td>
<td>50</td>
</tr>
<tr>
<td>Updateability feature</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>New feature</td>
<td>2</td>
<td>14</td>
</tr>
<tr>
<td>Webcasts</td>
<td>6</td>
<td>43</td>
</tr>
</tbody>
</table>

Table 6.3: Immediacy of environmental information on websites

Half of the companies did not appear to provide timely information. None indicated when a particular webpage was updated. Only two websites indicated whether new information had been added.

Six companies used webcasts, but these were mainly for corporate information. There was no evidence to suggest that these could be used for environmental issues. However, given that webcasts are related to particular events, it was difficult to ascertain their actual use for environmental issues with this form of analysis.

The above discussion reveals that not all companies provide regular environmental information on their website and that it is difficult to ascertain the immediacy of the information disclosed. Thus, a longitudinal study was needed to ascertain whether companies used their website on a regular basis to communicate environmental issues.
6.3.3  Multiple Cues

Table 6.4 indicates that graphics were the commonly used presentation tool. All the companies used graphics on their website, and pictures were the dominant graphic tool. The use of animated and multimedia tools was limited. Only three companies provided audio or visual enhancements on their website, while animated tools were used by five companies. Thus, companies were not fully utilising the benefits offered by the web for presentation purposes, highlighting a restricted use of the multiple cues feature.

<table>
<thead>
<tr>
<th>Feature</th>
<th>No of companies</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Graphics</td>
<td>14</td>
<td>100</td>
</tr>
<tr>
<td>Animation</td>
<td>5</td>
<td>36</td>
</tr>
<tr>
<td>Multimedia</td>
<td>3</td>
<td>21</td>
</tr>
</tbody>
</table>

Table 6.4: Multiple cues features on websites

Mining companies may make limited use of the web’s presentation flexibility in consideration of certain stakeholders whose ability to access the website would be restricted by the excessive use of graphical tools. The use of certain presentation tools such as animation and multimedia can impede the access speed of a website, and this is a problem for users who have a slow Internet bandwidth (SustainAbility/UNEP, 1999, 2001; Adams & Frost, 2004). Such issues could not be assessed during the website analysis but were explored during the interviews.

6.3.4  Language Variety

Table 6.5 highlights that companies used internal hyperlinks and menus extensively. External hyperlinks were provided by five companies. Eight companies utilised hyperlinks to distinguish between summarised and detailed information and eight used hyperlinks to integrate different types of information. A common example was the integration of environmental information with other social issues. This suggests that websites were being used to organise information for all stakeholders.

The data in the table also indicate that the portable document format (PDF) was the most common format for social and environmental reports (used by 13 companies) while three companies provided a social and environmental report web portal. Web
portals give stakeholders greater flexibility in viewing their reports. Only two MNCs provided their reports in more than one language to improve the readability of their reports in countries where their subsidiaries are located.

<table>
<thead>
<tr>
<th>Feature</th>
<th>No of companies</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Internal hyperlinks</td>
<td>13</td>
<td>93</td>
</tr>
<tr>
<td>External hyperlinks</td>
<td>5</td>
<td>36</td>
</tr>
<tr>
<td>Menus</td>
<td>14</td>
<td>100</td>
</tr>
<tr>
<td>Hyperlinks –detailed vs. summarised</td>
<td>8</td>
<td>57</td>
</tr>
<tr>
<td>Integration through hyperlinks</td>
<td>8</td>
<td>57</td>
</tr>
<tr>
<td>File Format - PDF</td>
<td>13</td>
<td>93</td>
</tr>
<tr>
<td>Social and environmental reports in different languages</td>
<td>2</td>
<td>14</td>
</tr>
<tr>
<td>Web Portal</td>
<td>3</td>
<td>21</td>
</tr>
</tbody>
</table>

Table 6.5: Language variety features on websites

Overall, it appears that, in contrast to the limited use of the multiple cues feature of the web, companies used their website to organise environmental information in a succinct manner. Thus, language variety was extensively utilised by mining corporations in their web based environmental communication.

6.3.5 Personal Source

Table 6.6 highlights that environmental information was not tailored to the needs of different stakeholders through the use of hyperlinks or menus. It appears that most information on websites was for stakeholders generally and that attempts were not made to organise information based on the needs of specific groups. Conversely, the data in the table highlight that push based mechanisms, such as email alerts, were used by half of the companies whose websites were analysed. These were not solely for environmental information.

<table>
<thead>
<tr>
<th>Feature</th>
<th>No of companies</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hyperlinks/Menus Stakeholders</td>
<td>–</td>
<td>0</td>
</tr>
<tr>
<td>Email alerts</td>
<td>7</td>
<td>50</td>
</tr>
</tbody>
</table>

Table 6.6: Personal Source features on websites
These findings indicate that even though the web has the potential to provide personalised sources of information through the use of pull and push technologies, there is limited evidence of the use of this feature in practice.

6.3.6 Multiple Addressability

The websites were accessible to all stakeholders. Access was not restricted by passwords or other mechanisms. Thus, the corporate websites enabled the mass communication of environmental issues. This highlights the increasing reliance on the multiple addressability features of the web.

6.3.7 Externally Recordable

Table 6.7 shows that archived information, such as social and environmental reports from multiple time periods, was available for stakeholders on most websites. Ten companies provided this material.

<table>
<thead>
<tr>
<th>Feature</th>
<th>No of companies</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Archived information</td>
<td>10</td>
<td>71</td>
</tr>
<tr>
<td>Downloadable reports</td>
<td>13</td>
<td>93</td>
</tr>
<tr>
<td>Ease of printing</td>
<td>14</td>
<td>100</td>
</tr>
<tr>
<td>Hit Counter</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Electronic Guest Book</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

Table 6.7: Externally recordable features on websites

The data also indicate that stakeholders could download social and environmental reports from all but one of these websites. The information presented on these websites was printable. Two companies provided printer friendly versions of their webpages.

It was difficult to ascertain whether companies sought information on the use of their website by stakeholders because hit counter facilities were not available on any website. Similarly, none of the websites had an electronic guestbook. It was not possible to ascertain whether any of these companies were using tracking software.

The discussion here reinforces the finding that a lot of corporate emphasis was placed on organising information on websites and making this information accessible to
various stakeholders. This highlights the increasing use of the externally recordable feature. However, evidence of mechanisms used to trace stakeholders through use of the web was limited. This could be expected due to the restricted form of website analysis undertaken.

6.3.8 Computer Processable Memory

Table 6.8 shows that companies focused on the web’s search facilities rather than its analytical capabilities. Menu based content was provided by all the companies. Search engines (12 companies), followed by sitemaps (7 companies), were also popular. These were for the overall website rather than specifically for environmental information.

<table>
<thead>
<tr>
<th>Feature</th>
<th>No of companies</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Search engines</td>
<td>12</td>
<td>86</td>
</tr>
<tr>
<td>Site maps</td>
<td>7</td>
<td>50</td>
</tr>
<tr>
<td>Menu based contents</td>
<td>14</td>
<td>100</td>
</tr>
<tr>
<td>Analytical Tools</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

Table 6.8: Computer processable memory features on websites

Analytical tools, such as, for example, those that allow stakeholders to analyse the existing environmental information on the basis of their different information needs, were not utilised by any company. Thus, stakeholders did not have the option of manipulating the environmental information based on their specific needs.

These findings highlight that computer processable memory was used to a moderate degree by companies in the Australian minerals industry.

6.3.9 Concurrency

Table 6.9 illustrates that some interactive tools were utilised while others were not used at all by any company. Automatic feedback forms were used by half the companies, but most sought feedback on the website or corporate issues rather than specifically environmental issues. Only one company sought feedback directly on environmental issues. Three companies sought feedback on their social and environmental reports through their website. This finding suggests that there were some options available for
individual stakeholders to contact the company but these were not always in the context of environmental issues.

<table>
<thead>
<tr>
<th>Feature</th>
<th>No of companies</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Automatic Feedback Forms</td>
<td>7</td>
<td>50</td>
</tr>
<tr>
<td>Electronic Surveys</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Email provisions</td>
<td>12</td>
<td>86</td>
</tr>
<tr>
<td>Discussion fora/Bulletin Boards/Chat rooms</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

Table 6.9: Concurrency features on websites

Conversely, electronic surveys were not evident on the websites. However, surveys are often carried out on an ad hoc basis. Therefore, the general website analysis was limited in discovering specific trends in web based environmental communication.

Two-way interaction was only possible through email; this option was provided by 12 companies. Again, these were not necessarily in the context of environmental information. Only one company provided various email contacts for a range of issues such as social, environmental and financial matters.

No companies used discussion fora, bulletin boards or chatrooms. Thus, web based technologies were not used extensively to promote two-way interaction between a company and its stakeholders.

It appears that companies had some features available on their website to enable concurrency, but these were generalised in nature. Nevertheless, the potential for engagement with stakeholders through the use of the web existed.

6.3.10 Summary

The results of the general website monitoring suggest that companies were not fully utilising the potential of the web for communicating environmental information. There was limited use of the immediacy and concurrency abilities of the web. The multiple cues and personal source features offered by the web were also not used extensively by all companies in the Australian minerals industry.
Companies were focusing primarily on organising environmental information through their website through the language variety, externally recordable and computer processable memory features and making this information accessible to their numerous stakeholders through the multiple addressability feature. The analytical (computer processable memory) and stakeholder tracing (externally recordable) capabilities offered by web technologies were also not evident from the general website analysis. Moreover, it was clear from this analysis that companies were providing general features on their website rather than features for individual sections of a website.

The general website monitoring undertaken here was limited in providing an in-depth understanding of present web based environmental communication practices. For instance, features such as immediacy and concurrency require a continuous examination of websites in order to assess the extent to which timely information is provided on websites and electronic interaction takes place. Therefore, a need arose for a longitudinal study, which was undertaken in the next stage of this research.

In summary, an overview of present web based environmental communication practices in the Australian minerals industry revealed that not all companies were utilising the web extensively for environmental communication. However, there were some companies that appeared to be utilising the potential of the web for environmental communication to a greater extent and, thus, specific companies were selected as cases for further analysis.

6.4 Selection of Cases

The general website analysis guided the selection of companies for the next phase of the research. Because the focus of this study was the Australian minerals industry, emphasis was placed on companies with local control over their website. A local focus means that decisions related to information content and dissemination on a website are made in Australia and much of the information relates to local operations. The approach also enabled the researcher to interact with corporate personnel to obtain in-depth insights into current practices.

The results of the first phase of the research revealed that six companies appeared to be the leaders in web based environmental communication. A marked difference in the
web based environmental communication practice (assessed in terms of the Media Richness Framework features) of these companies compared with other companies in the minerals industry was observed. There were two local Australian companies, two MNCs, an Australian company recently taken over by a multinational and, lastly, an Australian company that had recently merged with a foreign multinational.

The two multinationals that had their headquarters in foreign countries were not considered for the study. One of the local Australian companies was in voluntary administration and initial talks with its executives indicated that it would not be worthwhile to select the company for the research. The second phase of the research was therefore focused on the analysis of the web based environmental communication practice of three companies. They will be referred to from this point onwards as companies A, B and C.

Table 6.10 provides the details of these companies. All three had differences in their organisational structure and management. As such, there was some variation in all three cases. This variation assisted the cross-case comparison.

<table>
<thead>
<tr>
<th>Company</th>
<th>Details</th>
</tr>
</thead>
</table>
| A       | • A local Australian company that had been the leader in environmental communication in Australia.  
         | • Had its own website and its headquarters was based in Australia. |
| B       | • A former local Australian company which was recently taken over by a US corporation. While it was regarded as a local branch of this company, it still retained its Australian management and the majority of its environmental communication processes had remained the same.  
         | • Had its own Australian website, which was also linked to its parent company’s global website. |
| C       | • A former Australian company, which recently merged with a foreign MNC. It had its headquarters in Australia.  
         | • Had a global website with an extensive Australian representation. |

Table 6.10: An overview of companies selected for the case studies

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37 A year later, the company sold some of its operations and changed its name. Subsequently, it was re-listed on the Australian Stock Exchange.
All the selected companies appeared to use their website extensively for environmental communication. Information on their website was timely. Some changes were noticed in the second phase of the general website monitoring, indicating that these companies were utilising the immediacy feature.

The three companies had extensive environmental disclosure on their website. Social and environmental reports were prepared in accordance with the requirements of the Global Reporting Initiative and independent assurance was provided for all reports. All three companies had site based and prior year reports available on their website. These companies were also ranked highly in relation to environmental disclosure in the latest ‘Ore or Overburden’ survey (WWF, 2000).

An analysis of each company’s social and environmental reports indicated that two companies were providing summary reports in hardcopy form and had detailed reports available on their website as web portals. This suggested that these companies were moving beyond merely replicating hardcopy reports on a website and were using the communication potential of the web to disclose detailed environmental information.

Environmental disclosure on websites was not only limited to periodic social and environmental reports. There was disclosure of environmental performance information, environmental initiatives such as the Greenhouse Challenge program, environmental collaborations, and environmental awards on corporate websites. Two companies had separate sections for environmental news items, speeches and presentations. One also provided details of a past environmental incident.

Given that these companies were disclosing environmental information extensively to their stakeholders, it was likely that they required the presentation and organisation capabilities of web based technologies. Thus, multiple cues, language variety, externally recordable and computer processable memory features were likely to be extensively used. Moreover, this information had to be accessible to numerous stakeholders. Therefore, multiple addressability was likely to be critical for these companies.

The three companies had separate email contacts for environmental issues, enabling interaction with stakeholders electronically. Stakeholders could also sign up to email alerts. However, for two companies, these were for general corporate issues. The
companies also provided electronic feedback forms for their social and environmental reports. These developments provided some indication of the intention of the companies to engage with their stakeholders through use of the web. Thus, certain personal source and concurrency mechanisms were available for enabling interaction with stakeholders.

As indicated, the three companies were purposefully selected on the basis of the theoretical perspective adopted in this research. These companies had a range of stakeholders who were concerned about their environmental performance, and engagement and environmental reporting was necessary for them. Environmental communication through a ‘rich medium’ was therefore needed, and there were indications from the general website analysis to suggest that the three companies relied on the potential of the web for communicating environmental issues to their stakeholders.

6.5 Summary

This chapter has provided evidence that suggests that the potential of the web is utilised by companies in the Australian minerals industry, even though that usage varies among companies. Three companies were selected for the second phase of this study in order to obtain an in-depth understanding of their practices and establish the factors that contributed to the use of the web for environmental communication. The focus of the next three chapters is on the second phase of this study. Each chapter presents a case study of one subject company’s web based environmental communication practice.
Chapter Seven: ‘Continuous’ web based environmental communication in Company A

7.1 Introduction

This chapter presents the findings in relation to Company A. Section 7.2 discusses the specific data sources for this case. The next section focuses on the contextual background for the case by providing an overview of the company’s environmental issues and environmental communication practices. Section 7.4 addresses the first research theme— the extent of web usage—through an analysis of the data collected from the initial interview, documents and longitudinal website monitoring. Media Richness Framework features are used to assess the extent of web usage. Section 7.5 addresses the other research themes—management’s web based environmental communication needs, contextual factors and emerging themes—in order to establish the factors influencing the extent of web usage. Interviews and documents, which were supported by the website monitoring findings, were used in this analysis. In section 7.6, the findings for this case are interpreted in terms of the research model and extensions to the model are suggested.

7.2 Data Sources

As highlighted in section 5.5, longitudinal website monitoring, interviews and documents were used to collect data for the company specific phase of the research. These data were analysed in relation to the research objectives for this study; the extent of web usage and factors influencing this usage. The specific research themes from section 4.4 guided this analysis.

The longitudinal website analysis was organised in several stages. The initial structure of the website on 31 December 2003 provided the basis for ascertaining the changes made to the website over the year. The company had a restructure of its website on 8 March 2004. Therefore, the details of this restructure and subsequent changes on the website until the end of the year represented the second stage of the website analysis. Thus, the timelines for the longitudinal website analysis were 31 December 2003–7 March 2004 and 8 March 2004–31 December 2004.
The general website analysis findings in relation to Company A, as discussed in Chapter Six, were used in conjunction with the longitudinal website analysis results to assess the extent of web usage. However, a postscript stage (1 January 2005–September 2007) was developed to identify any significant issues related to web based environmental communication arising after the longitudinal website monitoring ceased at the end of 2004. This enabled a complete account of the company’s practice to be ascertained.

<table>
<thead>
<tr>
<th>Interviewee</th>
<th>Position</th>
<th>Job responsibilities in relation to environmental communication</th>
</tr>
</thead>
<tbody>
<tr>
<td>A1</td>
<td>General Manager, Environment, Health, Safety and Social Development</td>
<td>Managed the web based environmental communication practice of the company</td>
</tr>
<tr>
<td>A2</td>
<td>Public Affairs Manager</td>
<td>Assisted the environmental staff in web based communication by placing information on the website and managing the website</td>
</tr>
</tbody>
</table>

Table 7.1: Company A Interviewee Profiles

Table 7.1 describes the profiles of the interviewees for this study. The environmental and public affairs sections controlled the web based environmental communication practice in the company. An initial interview was held with the General Manager, Environment, Health, Safety and Social Development of Company A. This individual (Interviewee A1) and the Public Affairs Manager (Interviewee A2) held critical roles in the company’s web based environmental communication practice. The emphasis in this research was on seeking the views of those personnel who had a critical role in web based environmental communication. Thus, a second and third series of interviews were also held. A total of five interviews were held at Company A from February 2004 to February 2005. Three were with Interviewee A1 and two were with Interviewee A2.

The initial interview data provided an overview of web based environmental communication in Company A. Moreover, the analysis of data from all the three interview phases focused on the factors influencing the use of the web for environmental communication. This was guided by the extent of web usage identified through the general and longitudinal website analysis. If any of the factors explained the events of the postscript stage, these were also discussed.

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38 Further details are provided in section 7.4.1
Figure 7.1 lists the documents that were accessed in relation to Company A. All the documents were publicly available on the company’s website. These documents provided a contextual background for the case in section 7.3. It enabled useful insights to be gained in relation to the critical environmental and stakeholder issues for the company. The documents were also used in some instances to corroborate evidence from the other data collection sources—namely, website monitoring and the interviews.

* Figure 7.1: Documents accessed for Company A

- Business Performance (Annual) Reports, 2001-2004
- Social and Environmental Reports, 2001, 2002 (Summary plus detailed report on website)
- Archived Web Portal for Social and Environmental Reports, 2003, 2004
- Environmental Policy (2004).
- Media release announcing move towards continuous social and environmental communication in 2004
- Email sent to stakeholders on availability of archived web portal of Social and Environmental Report, 2005

Company A’s business performance reports and social and environmental reports, which were available on its website from 2001 onwards, were analysed. The company used an archived web portal after the release of its 2003 social and environmental report so the 2003 and 2004 web portal reports were also analysed. An email and a media release related to its web based approach to environmental communication were publicly available. Recent environmental policy and environmental management standards documents were also accessed. All these documents were analysed, as discussed in section 5.6.2. Towards the end of the research process, Company A was subject to a takeover bid. The documents related to the takeover were analysed because this event had a critical impact on the company’s web based environmental communication practice.

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39 Specific details of the documents related to the takeover are not discussed, due to confidentiality reasons.
7.3 Contextual Background

Company A’s social and environmental reports indicated that disturbance to land and biodiversity, emissions to air and surface waters, and impacts associated with the generation, storage and disposal of wastes were critical environmental issues for the company. These impacts can lead to environmental incidents as well as affect the productive use of land used for mining activities after the completion of the mining cycle (Social and Environmental Report, 2001, 2002; Web Portal, 2003, 2004).

The company’s environmental policy stressed the importance of reducing the adverse environmental impacts of its mining activities. Consequently, environmental management was quite critical for the company. Emphasis was placed on the efficient use of water and energy, the reduction of emissions, land and tailings\(^{40}\) management as well as the rehabilitation of mining sites (Social and Environmental Report, 2001, 2002; Web Portal, 2003, 2004). The company also established an environmental non-compliance incidents reporting system, whereby a formal record of instances where established environmental management procedures were not effectively followed (leading to environmental incidents) was kept (Social and Environmental Report, 2001, 2002, Web Portal, 2003, 2004). These incidents were ranked on a scale from one to five, with five representing the most severe incident. Emphasis was placed on controlling and reducing these non-compliance incidents.

In addition to its focus on environmental management, the analysis of the company’s social and environmental reports indicated that it was also involved in a number of mandatory and voluntary environmental initiatives. As a member of the Minerals Council of Australia (MCA), it signed up to the code of environmental management and its successor, which was entitled Enduring Value. The company also participated extensively in the development of these initiatives. Company A was involved in the Greenhouse Challenge program and had to report to the National Pollutant Inventory. It was also a founding member of the Global Mining Initiative and one of six local companies that was involved in the Mining Certification Evaluation Project. Moreover, the company had publicly declared that it would not undertake riverine tailings

\(^{40}\) Tailings are the liquid waste products that remain after the mining process has been completed.
disposal\textsuperscript{41} or carry out its mining operations at protected World Heritage areas (Social and Environmental Report Web Portal, 2003).

Documentary evidence suggested that Company A was one of the first Australian corporations to publish an environmental report. The company produced its first Environmental Progress Report in 1994–95. It produced a Community Report for its operations in 2000 and a Sustainability Report from 2001 onwards. Thus, the company had a history of producing social and environmental reports over a number of years and was selected for this study because of its comprehensive use of its website for environmental communication. Company A was ranked as one of the leading social and environmental reporters in the ‘Ore or Overburden’ survey (WWF, 2000) and Peck and Sinding (2003) study, as discussed in section 5.3.

7.4 The Extent of Web Usage

Company A’s extent of web usage for environmental communication was explored through the initial interview, documents and website analysis. The interview and documentary evidence were used to establish the role of the corporate website in environmental communication and to identify the personnel and processes involved in web based environmental communication. The longitudinal website analysis was used to ascertain the extent of web usage for environmental communication over time.

7.4.1 An overview of web based environmental communication

The General Manager, Environment, Health, Safety and Social Development (Interviewee A1) perceived the web as an effective tool for environmental communication, with the company expected to undertake continuous communication in the future. Continuous communication was described by him as ‘the process of utilising our website on a regular basis to communicate ongoing information related to social and environmental issues’ (February 2004). The interviewee revealed that the company had for the most recent reporting year (2002) produced a brief summary of social and environmental issues in a hardcopy report while the website contained a detailed social and environmental report. An analysis of the company’s social and environmental reports confirmed that this practice started in 2001. Company A produced a summary of

\textsuperscript{41} Riverine tailings disposal involves the disposal of tailings into rivers close to a mine site.
its social and environmental report in hardcopy form. A compact disc was also attached which contained the detailed report as well as site reports. The full report was presented as a web portal. Interviewee A1 stated that the company intended to exclusively use the web for environmental communication after the release of its next social and environmental report (2003).

The longitudinal website analysis discussed in the next subsection highlights that, a few weeks after the first interview, Company A moved to a web portal approach for its environmental communication. Its social and environmental report was available only on its website. Emphasis was placed on providing ‘live’ environmental information on the website through regular updates of the web portal.

Interviewee A1 was in charge of the overall web based environmental communication process in the company. He indicated that web based environmental communication was a multidisciplinary approach within the organisation. In addition to the environmental/sustainability staff, public affairs personnel were involved.

Interviewee A1 indicated that environmental personnel included those at the site level as well as those at the corporate level who aggregated the environmental information. He also revealed that staff involved in corporate communications, under the leadership of the Public Affairs Manager (Interviewee A2), included those competent in website design and information technology support as well as those involved in general communications. They ensured that the detailed technical environmental information was converted into a form that could be understood by all stakeholders. In addition to these parties, the interviewee highlighted that their legal team and board of directors also had a role in web based environmental communication.

The initial interview indicated that the use of the web for environmental communication within Company A involved a formal process. Interviewee A1 stated that the corporate environmental personnel created environmental information for communication purposes by liaising with environmental managers at the various sites. He added that this information had to be passed to the corporate communications section, where staff were involved in converting environmental information for communication purposes. The interviewee also mentioned that consideration was given to how the web could be
used to communicate this information and that this process could involve consultation between the interviewees A1 and A2.

Interviewee A1 stated that internal approvals and vetting followed these processes. These were likely to be stringent for periodic communication with the legal team and the board of directors also having extensive involvement. Ad hoc communication processes could be expedited. Interviewee A1 would consult Interviewee A2, who had authority to allow information changes on the website in relation to environmental issues. Interviewee A1 remarked:

I am responsible for what environmental information goes on the website and the public affairs manager is responsible for assessing the sensitivity of the information. Board and senior management are advised of this but the decision on what goes on the website is decided at the general manager level. (February 2004)

The initial interview suggested that, given its decision to undertake continuous communication, processes and guidelines for what had to be communicated were in the development stages in the company. Interviewee A1 remarked:

We are currently working on what criteria to decide to communicate on and which things are reportable. Intuitively, we know what we are going to communicate and we will update this, but we need to clearly delineate and codify what goes on the web. (February 2004)

Interviewee A1 mentioned that there was also the issue of verifying information on the website. The company was exploring ways in which verification for continuous communication could be undertaken. A possible avenue that the company had considered was to ‘freeze information on the web portal’ at the end of the year and have the information verified by independent auditors.
Figure 7.2 summarises the web based environmental communication practice in Company A, as established from the initial interview. The figure highlights the critical role of the environmental and public affairs personnel in web based environmental communication. This supported the selection for interview of those in charge of these processes.
7.4.2  *Longitudinal website analysis*

7.4.2.1  **Stage one – 31 December 2003–7 March 2004**

7.4.2.1.1  **Initial Structure – 31 December 2003**

Company A had extensive environmental information communicated on its website as at 31 December 2003. Figure 7.3 provides specific details of the initial structure of the environmental section of its website.

The company had a specific section for social and environmental issues on its website, highlighting that these issues were an integral component of its corporate communications. Environmental issues dominated the communication of social and environmental issues. Current and past social and environmental reports were provided for overall operations as well as for individual sites. For the social and environmental reports for 2001 and 2002 the company used a separate web portal on its website to provide detailed information. As indicated earlier, only a summary report was available in hardcopy. A verification statement for its detailed social and environmental report was also provided.

As Figure 7.3 highlights, Company A communicated a range of information on environmental policies, performance and initiatives. It had specific sections for social and environmental presentations and news releases. There were also external links from the company’s website to other environmentally related websites.

A separate section contained contact details, including email addresses for the various social and environmental departments of the company. Stakeholders could also sign up for social and environmental news email alerts. Feedback forms for social and environmental reports were available on the website.
**Introduction**
- Brundtland definition of sustainable development
- Email contacts for sustainable development department, environment, health and safety department, and community department
- Menu items for Company A and Sustainability, Policies, Community, Environment, and Safety and health
- Links to sustainability news items
- Link to sustainability reports
- Link to signing up for news alerts

**Company A and Sustainability**
- Our Approach
- Public reporting
- Investment Indices
- Presentations
- Contacts

**Policies**
- Code of Conduct
- Safety and Health Policy
- Environmental Policy
- Community Policy
- Indigenous peoples policy
- Release of Information
- HR privacy policy

**Community**

**Environment**
- Brief Introduction
- Our Approach
- Hyperlinks for Sustainability reports – 2002 and previous environmental reports
- Related pages – hyperlinks for environmental policy, environmental standards, greenhouse challenge, national pollutant inventory, tailings.
- Links to other sites - World Business Council for Sustainable Development, International Council on Metals and the Environment, environmental collaboration project link, Australian Centre for Mining Environmental Research

**Safety and Health**

**Reports**
- Sustainability Report 2002- Full report, GRI index, Feedback, Previous reports
- Business performance report 2002
- Electronic Report Verification statement
- Site Reports and Data

Figure 7.3: The structure for Company A’s website contents in relation to environmental information as at 31 December 2003

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7.4.2.1.2 Changes from 1 January 2004 – 7 March 2004

The website structure and information content for Company A was static during this period. As discussed in section 7.4.1, the company intended to change its web based environmental communication practice from the release of its next social and environmental report. Thus, the static nature of the website during this period was expected. This situation did not indicate that the company had reduced the use of its website for environmental communication. It was merely a temporary phase due to the company’s decision to change its approach to web based environmental communication.

7.4.2.2 Stage two – 8 March 2004 – 31 December 2004

7.4.2.2.1 Restructure of environmental section – 8 March 2004

Company A decided to adopt a continuous environmental communication strategy through use of the web from 8 March 2004. Figure 7.4 provides specific details of the restructure of the environmental section of its website.

The company used a web portal for its 2003 social and environmental report to provide a structure for its continuous web based environmental communication. The website also provided information on the intention of the company to continue updating information on this portal on a regular basis. A range of environmental information appeared on the web portal.

The web portal had an overview section, a specific section on environment, health and safety, sections on other social and environmental aspects, and a section with information on the company’s environmental performance. There was also a noticeboard section used to inform stakeholders of any new social and environmental information that was added to the website. A feedback section provided an email and a feedback form that stakeholders could utilise to contact the company in relation to social and environmental issues.
Introduction

Our Approach
- Overview
- Our Journey
- Global Initiatives
- Verification statement

Our Community

Environment, Health and Safety (EHS)
- EHS Policies
- Management systems
  - Introduction
  - EHS management systems standards
  - Major Hazard standards
  - Environmental operating policies
- Audit and assessment
- Operational risk management
- Cultural and behaviour program
- Our key EHS aspects
  - Targets and performance management
  - Environmental non-compliance incident reporting
  - Fitness for work
  - Greenhouse gases
  - Orphan sites
  - Environmental impacts

People

Our performance
- Overview
  - Introduction
  - Community
  - Environment, health and safety
  - Employees
  - Combined Company Data
    - Safety and Health
    - Internal Audit Table
    - Non-compliance data
    - Environmental Data Table
    - Orphan Site Management
    - Employees
    - Fitness for Work
    - Inputs and Outputs
- Individual operations information

Noticeboard

Feedback

Figure 7.4: The structure of Company A’s social and environmental web portal contents from March 2004
7.4.2.2  Changes to the website in 2004 – March–December 2004

As Table 7.2 indicates, Company A’s adoption of a continuous communication strategy from March 2004 led to extensive changes on its website in successive periods. Periodic information and updates and the re-organisation of some sections of the website took place initially. General social and environmental issues were communicated regularly. The company also provided its environmental, health and safety (EHS) compliance data for each quarter during the year.

The data in the table also indicate that there was an extensive focus on the communication of the Global Reporting Initiative and Greenhouse Challenge, the company’s ranking in the Dow Jones sustainability index and other environmental initiatives that the company was involved in. Emphasis was also placed on communicating environmental incidents on a regular basis throughout the year.

Towards the end of the year, there was limited communication on the website. The later interviews and the news media revealed that the company was being subjected to a hostile takeover bid around this time. Thus, the potential takeover could have impacted the company’s web based environmental communication practice during this time.
<table>
<thead>
<tr>
<th>Date</th>
<th>Information Content</th>
<th>Issue</th>
<th>Change on website</th>
<th>Website feature</th>
</tr>
</thead>
<tbody>
<tr>
<td>March 8</td>
<td>Launch of Sustainability Web Portal.</td>
<td>General environmental</td>
<td>Yes – overall change as web portal established</td>
<td>Text with hyperlinks for verification statement and feedback</td>
</tr>
<tr>
<td>March 22</td>
<td>News item on positive comments received from Western Australian premier for the company’s role in assisting in preserving a wildlife icon</td>
<td>Social (Conservation)</td>
<td>No</td>
<td>Plain text</td>
</tr>
<tr>
<td>April 15</td>
<td>Company ranked 4th for sustainability in Australia’s top 50</td>
<td>Environmental Initiative</td>
<td>No</td>
<td>Plain text</td>
</tr>
<tr>
<td>April 21</td>
<td>Tailing release in Western Australia reported to relevant state authorities</td>
<td>Environmental incident</td>
<td>No</td>
<td>Text with hyperlink to non-compliance reporting page</td>
</tr>
<tr>
<td>April 27</td>
<td>The social and environmental presentations and publications section is now part of sustainability web portal.</td>
<td>General environmental</td>
<td>Yes. This webpage now appears under the environmental performance section.</td>
<td>NA</td>
</tr>
<tr>
<td>May 7</td>
<td>Information on audit of a particular division’s operations undertaken in November 2003 provided</td>
<td>Environmental performance</td>
<td>No</td>
<td>Text with hyperlink to letter of advice from South Australia EPA</td>
</tr>
<tr>
<td>May 11</td>
<td>GRI index update provided</td>
<td>Environmental initiative</td>
<td>Yes. Our approach section has new hyperlink called GRI index, which provides detailed information on this matter.</td>
<td>Text with hyperlink to GRI index, GRI index has hyperlinks to organise information</td>
</tr>
<tr>
<td>May 13</td>
<td>Tailing release reported to Western Australia Department of Environment.</td>
<td>Environmental incident</td>
<td>No</td>
<td>Text with hyperlink to non-compliance reporting page</td>
</tr>
<tr>
<td>May 21</td>
<td>Spill at a division reported to South Australia government</td>
<td>Environmental incident</td>
<td>No</td>
<td>Text with hyperlink to non-compliance reporting page</td>
</tr>
<tr>
<td>May 28</td>
<td>Update on safety data and environmental non-compliance data for quarter 1, 2004 provided.</td>
<td>Environmental performance</td>
<td>Yes. Relevant webpages in environmental performance section updated.</td>
<td>Text with hyperlink to our performance</td>
</tr>
<tr>
<td>June 18</td>
<td>Remediation work started at particular mine site</td>
<td>General environmental</td>
<td>No</td>
<td>Text</td>
</tr>
<tr>
<td>July 14</td>
<td>Discussions held with South Australia government for possibility of a waste repository for the state at a particular division of the company</td>
<td>General environmental</td>
<td>No</td>
<td>Plain text</td>
</tr>
<tr>
<td>Date</td>
<td>Information Content</td>
<td>Issue</td>
<td>Change on website</td>
<td>Website feature</td>
</tr>
<tr>
<td>-------------</td>
<td>-------------------------------------------------------------------------------------</td>
<td>----------------------------</td>
<td>----------------------------------------------------------------------------------</td>
<td>------------------------------------------------------</td>
</tr>
<tr>
<td>July 28</td>
<td>Update on safety data and environmental non-compliance data for quarter 2, 2004 provided.</td>
<td>Environmental performance</td>
<td>Yes. Relevant webpages in environmental performance section updated.</td>
<td>Text with hyperlink to our performance</td>
</tr>
<tr>
<td>July 29</td>
<td>Nickel smelter spill reported to Western Australia Department of Environment.</td>
<td>Environmental incident</td>
<td>No</td>
<td>Text with hyperlink to non-compliance reporting page</td>
</tr>
<tr>
<td>August 25</td>
<td>Uranium Fact Sheet available for particular operations</td>
<td>General environmental</td>
<td>No</td>
<td>Text with hyperlink to fact sheet</td>
</tr>
<tr>
<td>August 26</td>
<td>Information available for monitoring workplace conditions</td>
<td>Social (Employee)</td>
<td>Yes. Relevant hyperlink added to EHS aspects in EHS section.</td>
<td>Text with hyperlinks to workplace conditions in EHS section</td>
</tr>
<tr>
<td>September 10</td>
<td>Spill in particular division reported to South Australia government</td>
<td>Environmental incident.</td>
<td>No</td>
<td>Text with hyperlink to non-compliance reporting page</td>
</tr>
<tr>
<td>October 14</td>
<td>The Company’s major hazard standards (nineteen in total), which it implemented since 1997 are available online</td>
<td>Social (Health and Safety)</td>
<td>Yes, the major hazard standards section in the environmental, health and safety section has been expanded</td>
<td>Text with hyperlink to major hazards section</td>
</tr>
<tr>
<td>October 20</td>
<td>Quarter 3, 2004 safety performance and environmental non compliance data has been updated</td>
<td>Environmental performance.</td>
<td>Yes, update in our performance section.</td>
<td>Text with hyperlink to Our performance section</td>
</tr>
<tr>
<td>October 27</td>
<td>The company’s 2003 greenhouse challenge report is available.</td>
<td>Environmental initiative</td>
<td>Yes, the greenhouse gases section under the EHS section has been updated.</td>
<td>Text with hyperlink to greenhouse gases section.</td>
</tr>
<tr>
<td>November 26</td>
<td>Monitoring workplace conditions update – results for January – June 2004 available</td>
<td>Social (employee)</td>
<td>Yes, the monitoring workplace conditions section in EHS section has been updated.</td>
<td>Text with hyperlink to monitoring workplace conditions section.</td>
</tr>
</tbody>
</table>

Table 7.2: Changes on Company A’s website in relation to social and environmental issues (March-December 2004)
7.4.3 Overall web usage

Having explored the company’s web based environmental communication practice, the extent of its web usage can be ascertained. Media Richness Framework features were applied to the findings relating to Company A’s practice as observed during the general website analysis (Chapter Six) and the two stages of the longitudinal website analysis. Table 7.3 summarises the extent of web usage in relation to the Media Richness Framework features. They are discussed subsequently.

<table>
<thead>
<tr>
<th>Media Richness Framework feature</th>
<th>Evidence</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Immediacy</strong></td>
<td>Undertook continuous web based environmental communication from March 2004. The noticeboard provided details of any new information added to the website.</td>
</tr>
<tr>
<td><strong>Multiple Cues</strong></td>
<td>Presentation flexibility mainly limited to pictures and graphics. Multimedia and animation features were not evident from the website.</td>
</tr>
<tr>
<td><strong>Language Variety</strong></td>
<td>Hyperlinks, menus and portals were extensively used. A web portal was used to organise information to enable continuous web based environmental communication.</td>
</tr>
<tr>
<td><strong>Personal Source</strong></td>
<td>Prior to March 2004, email alerts were available specifically for social and environmental issues. Hyperlinks were not used to provide specific information for each stakeholder. Emails were primarily used to enable a personal source for stakeholders after March 2004.</td>
</tr>
<tr>
<td><strong>Multiple Addressability</strong></td>
<td>The mass communication and global reach of the web was utilised by the company in its continuous web based environmental communication.</td>
</tr>
<tr>
<td><strong>Externally Recordable</strong></td>
<td>Current and prior reports were available on the website and these could be printed and downloaded.</td>
</tr>
<tr>
<td><strong>Computer Processable Memory</strong></td>
<td>A search engine was available on the website but analytical tools were not utilised.</td>
</tr>
<tr>
<td><strong>Concurrency</strong></td>
<td>Emails and feedback forms facilitated interaction with stakeholders.</td>
</tr>
</tbody>
</table>

Table 7.3: The extent to which the web was utilised for environmental communication by Company A in relation to the Media Richness Framework features, as at 31 December 2004

Even though the general website analysis findings in relation to Company A, and the first stage of the longitudinal website analysis (31 December 2003–7 March 2004) highlighted that information was not updated on websites on a continual basis, the company undertook continuous web based environmental communication from March 2004. This development enabled the company to report on issues such as environmental
performance, initiatives and incidents on a regular basis in the second longitudinal website analysis stage (8 March 2004–31 December 2004). The noticeboard feature provided a link to any new information added to the website. This feature could be used by stakeholders to gain an understanding of how recent the environmental information was, as dates were provided for each item disclosed on the noticeboard. These findings indicate that the company utilised the immediacy of the web extensively during the period of analysis.

As highlighted by the website analysis stages (general website analysis and both the stages of the longitudinal website analysis), graphics were utilised extensively. However, the use of tools such as multimedia and animation were restricted. The company utilised simple presentation features and placed emphasis on getting information easily to its stakeholders. Pictures and diagrams were often used to illustrate text. There was no evidence of the use of audio or video tools. This evidence highlights that multiple cues had moderate usage.

The various website analysis stages indicated that hyperlinks and menus provided tools for the company to succinctly organise environmental information and enable navigation of the website. Information could also be integrated through a mere click on a hyperlink or menu item. These facilities enabled continuous web based environmental communication to be undertaken. A web portal was used after 8 March 2004 to communicate environmental issues. The portal utilised hyperlinks and menus extensively to organise and integrate environmental information. These findings indicate that the language variety feature was extensively utilised.

As is evident from the general website analysis and first longitudinal website analysis stage, the company had a facility on its website where stakeholders could sign up for email alerts for a range of social and environmental issues. However, in the second longitudinal website analysis research stage, the noticeboard replaced these email alerts once the company adopted its continuous environmental communication strategy. Moreover, it was observed during the website analysis stages that hyperlinks were not used to provide specific information for each stakeholder. Emails were the only tool that enabled the personal source feature to be realised from the second stage of the longitudinal website analysis, indicating a moderate use of this feature.
The mass communication and global reach of the web enabled a range of stakeholders to be targeted by the company. These stakeholders had access to all the environmental information on its website. Thus, the multiple addressability feature was extensively utilised, as is evident from the various website analysis stages.

The company’s website enabled environmental information to be printed. Printer friendly versions of webpages were available in the second longitudinal website analysis stage. Past reports could be downloaded from the website, as observed during the various website analysis stages. The sustainability noticeboard and an archived web portal allowing access to environmental information from earlier periods was evidence of archived environmental information in the second longitudinal website analysis stage. Thus, the externally recordable feature was utilised extensively.

A search engine was available for the company’s social and environmental web portal. However, analytical tools, such as electronic tools which could enable stakeholders to analyse the existing environmental information on the basis of their different information needs, were not provided on the website for stakeholders. Thus, the use of the computer processable memory feature was moderate, as observed during the various website analysis stages.

Emails and feedback forms were utilised for electronic interaction. More advanced methods for electronically engaging stakeholders, such as bulletin boards, chatrooms and discussion fora, were not available. These findings were consistently obtained during the various website analysis stages and indicate that the concurrency feature was moderately utilised.

7.4.4 Postscript – 2005–September 2007

Certain events took place beyond the detailed period of analysis which had implications for this study. In the first three months of 2005, social and environmental issues continued to be communicated on the company’s website. In April 2005, the company developed an archived web portal for social and environmental information related to its 2004 operations. This portal was tested by independent auditors and was linked to its current social and environmental webpage. An email was sent to stakeholders indicating
that the archived web portal presented the 2004 social and environmental report and that continuous information could also be accessed by stakeholders.

There was no new social and environmental information added to the company’s website after April 2005 because news of a potential takeover surfaced. Company A was eventually taken over in June 2005 by a multinational. The takeover led to its web based environmental communication practice being abandoned. Immediately after the takeover, the company’s website was taken offline. When its URL was typed, users were directed to the parent company’s website.

7.5 Factors Influencing Web Based Environmental Communication

Having established the extent of web use for environmental communication, the factors that could explain this usage were investigated. The research model and themes guided this process. However, in line with the case study approach, findings from the field had the potential to extend the model. Management’s web based environmental communication needs are considered before contextual influences are discussed. Emerging themes that extended the research model are also discussed.

7.5.1 Management’s web based environmental communication needs

Management’s needs for environmental communication through the web were identified through the interviews with the interviewees A1 and A2. The impact of these needs on the extent of the use of the web, established through the website analysis (general and longitudinal), was then ascertained.

7.5.1.1 Timeliness

The longitudinal website analysis was critical for this phase of the research as it captured Company A’s transition from using a static to a continuous web based environmental communication practice. Interviews provided insights into the recognition by corporate personnel of the potential for the web to provide timely communication. This eventually led to the adoption of the continuous web based environmental communication strategy by the company.
It was evident from the initial interview that even though the general website analysis and the first stage of the longitudinal website analysis had indicated restricted use of the immediacy feature by Company A, there was an emphasis on the need for timely communication through the web. Interviewee A1 indicated that, in addition to communicating general information such as environmental policies, the company intended to communicate environmental performance information, environmental achievements and initiatives as well as environmental incidents on a regular basis. There was a focus on publicly reporting anything that was communicated to governments and regulators as well as to make most internally generated information available to stakeholders.

Given the emphasis on timeliness as identified from the initial interview, the company sought to utilise the immediacy aspect of the web for environmental communication. This issue is clearly summarised by the following quote:

We are moving to a process of sustainability communication where we would have enduring elements on our website that describe the way we are managing sustainability. We’ll have elements on the website that have historical performance data. But we’ll be using it increasingly more for ongoing and continuous communication. In the very rare event that we may have incidents such as spills, we will be using the website to inform stakeholders.

We will use the website to update information for stakeholders in relation to some of our sustainability initiatives rather than waiting till the end of the year for sustainability communication.

In a nutshell, we will be using the web for more of a continuous ongoing means of communication. We will be providing a more effective and complete access to environmental information on the web.  

(Interviewee A1, February 2004)

This indicates that the company was considering an increase in the use of the timeliness potential provided by the web and supports the company’s movement to regular web based environmental communication, as ascertained from the second stage of the longitudinal website analysis. The media release announcing its move to regular web based environmental communication indicated that the web allowed Company A to publish its ‘performance, challenges, achievements and, of course, failures as they occurred’ (March 2004). This release also highlighted the company was taking advantage of these benefits of the web in its new approach to environmental communication:
The (web)site is live and the sustainability noticeboard carries regular updates. (March 2004)

Interviewee responses in the second and third series of interviews supported the increasing use of the web for timely communication:

(The web) has allowed us to fundamentally change our point in time communication to continuous communication. For example, indicators on non-compliance on a daily basis, injury data on a quarterly basis, etc. (Interviewee A2, May 2004)

We can put something on the web pretty quickly. It is a real benefit to us. (Interviewee A1, February 2005)

Interviewee A1 indicated that the use of the web for continuous communication after March 2004 was merely an attempt to take advantage of the evolving nature of technology. It did not represent a radical change to the existing means of environmental communication:

The issue is how we manage our sustainability communication. Some critical issues on the back end will change regularly while certain front-end things will not change that often. The fundamental approach we take to managing the environment does not change but our performance and targets will change so we need to update this. (May 2004)

In summary, the interviewees acknowledged a need for timeliness through the web medium throughout all the interviews. Terms such as ‘timely’, ‘update’, ‘continuous’ and ‘ongoing’ were extensively used, highlighting that there was a critical need for communicating timely environmental information to stakeholders through the web. This finding explains the extensive use of the immediacy feature in Company A’s web based communication practice from March 2004, as highlighted in the second stage of the longitudinal website analysis.

7.5.1.2 Presentation and Organisation

Interviewee A2 remarked that utilisation of the presentation and organisation capabilities of the web medium was a learning process for many companies:
I think our experience with web based communication is similar to text based reporting in the 1990s where we were learning what to do with it and how to do it. This is similar to financial reporting on the web.

A lot of companies have merely posted reports on websites. They haven’t taken the next step about what is it about, the Internet, and what special features does it have that we could communicate better. But this will happen soon – be it two years or 10 years. (May 2004)

In relation to presentation through the web medium, responses from all the interviews suggested that the emphasis was mainly on pictures and graphics. For instance, interviewee A2 stated:

**We do use images, photos, to highlight particular stories.** (May 2004)

However, when probed in relation to the need for tools such as multimedia and animation, the interviewees stated that these were not considered as an essential component of the company’s web based environmental communication. This was attributed to the need for the website to be accessible to stakeholders with limited technological capabilities. Interviewee A2 remarked:

**We try to keep it (website) simple rather than having too many presentation features which people may find annoying rather than helpful.** (May 2004)

Thus, management’s need for the presentation capabilities provided by the web was limited to simple mechanisms such as pictures and graphics, and complex tools such as multimedia and animation were not justified. This finding explains the moderate use of multiple cues, evident during the various website analysis stages.

The benefits of hyperlinks, menus and web portals were recognised in all the interviews. This explains the extensive use of the language variety feature observed during the analysis of websites. The interviewees highlighted that web based technologies enabled a range of environmental information to be made available on corporate websites. They used the term ‘flexibility’ quite extensively to denote the language variety feature. Emphasis was also placed on utilising hyperlinks to integrate environmental information with other types of information:

**We do use hyperlinks to link different areas of the website to the sustainability section.** (Interviewee A2, May 2004)
The interviewees often used the term ‘dynamic nature’ to describe the ease with which information could be amended on the website. They perceived this feature as a critical benefit of the web as information could be updated quite easily. It was also mentioned that a website enabled past information to be stored and made accessible to stakeholders:

*We also use hyperlinks to direct users to archival information in our prior period reports.* (Interviewee A2, May 2004)

The noticeboard was referred to in the second and third series of interviews as a tool that provided a record of information added to the website during the year. Thus, even though the company undertook continuous communication, archived information could also be accessed through the noticeboard. In addition to the support for the externally recordable feature discussed here, the interviews also indicated that tracking software was utilised by Company A.

The interviewees supported the use of tracking software for an analysis of trends in the use of their website for environmental issues. Interviewee A1 remarked:

*The benefit of having a sustainability report on the web is that we are able to determine how many users have accessed the information. In the past, we used to mail 10,000 reports to stakeholders and would receive about 100-200 feedback slips. When you report on the web, you know exactly what people are reading.*

*The web is a far more effective medium if you are looking to gain an understanding of the way people are using the information. We do not know who is looking at it but we know how many people are looking at it in more detail.* (Interviewee A1, February 2004)

The interviewees mentioned that the company used the knowledge gained from the use of tracking software to inform their future disclosure of environmental information on the website. Thus, evidence from the website analysis, coupled with the evidence gained in the interviews, indicates that the externally recordable feature matched management’s organisational needs.

In relation to the computer processable memory feature, the interviewees mentioned that search tools on a website are critical for an organisation. However, in none of the interviews was analytical tools regarded by them as important. This finding explains the
moderate use of the computer processable memory feature in practice, which was evident from the various website analysis stages.

It was evident from the interviews that the use of the organisational capabilities of web based environmental communication was a process that was directed at stakeholders in general rather than specific stakeholders. For instance, Interviewee A1 stated:

*We have made the decision to communicate to a general audience.*

(February 2004)

*…it (web based communication) is not directed at individual stakeholders.*

(May 2004)

These findings explain the limited use of the personal source feature regarding the use of hyperlinks and menus to target specific stakeholders, as observed during the website analysis.

In summary, the interviewees acknowledged a need for the organisation aspects of web based environmental communication throughout the different interviews at Company A. In line with the website analysis findings, the language variety and externally recordable features were found to be critical, the computer processable memory benefits were restricted to search based tools and the personal source feature had restricted application. Together, the views of the interviewees highlight that the need for presentation and organisation through the web medium was critical. There was, however, variation in relation to the use of specific Media Richness Framework features.

It appeared from the interviews that Company A was content with its existing means of web based communication, which took advantage of some of the presentation and organisational capabilities of the web discussed here. The need for more complex mechanisms on the website was a potential future strategy that they could use once web based environmental communication rose in prominence.

7.5.1.3 Accessibility

Management related the accessibility aspect of communication to the mass communication and global reach advantages offered by the web. Some of the comments
in support of the accessibility benefits provided by the web raised during the different interview phases were as follows:

*We find it (web) is a very effective tool to communicate with a broad range of stakeholders*…(Interviewee A1, February 2004)

*Having information on the website itself allows mass communication of it to numerous stakeholders.* (Interviewee A2, May 2004)

*…if only one person accesses the website, it is worth doing it. It actually provides people with access; whether they use it or not is entirely up to them. The only universally available means of accessing that we have got.* (Interviewee A1, February 2005)

This indicates that the extensive use of the multiple addressability feature of the web, as is evident from the website analysis, was due to management’s critical need for accessible communication via the web medium.

**7.5.1.4 Interaction**

It was mentioned in all the interviews that tools such as emails and feedback forms were useful. The web was perceived as a tool for establishing contact with stakeholders as well as seeking feedback from them. At the very least, email communication assisted in interacting with stakeholders. Interviewee A2 stated that they received numerous emails every week in relation to environmental issues and that they had a seven-day response policy.

In all the interviews, responses to probes regarding the need for certain interactive mechanisms, such as discussion fora, bulletin boards and chatrooms, suggested that these were not perceived by the interviewees to be critical for environmental communication. They were either not aware of these capabilities or were reluctant to utilise them. Section 3.4.5 highlights that sophisticated tools for enabling electronic interaction could extend environmental reporting processes to encompass environmental communication. However, the evidence related to the practice in Company A in the various website analysis stages indicates that the personal source and concurrency features are limited to emails and feedback forms. The interviews highlighted that management has a limited need for interaction through the web.
Interviewee A1 warned that electronic feedback through their website was only from those stakeholders who had access to the web:

*We always use the web to get feedback. But the trouble with that option is that you are not getting a broader understanding of different views – it is only those who have access to the Internet.* (May 2004)

These comments contrast with the comments related to the universality of the web which were raised by the same interviewee and reported in the preceding section. It appears from such responses that even though the company perceived the web as an accessible medium for communication, this benefit was merely limited to one-directional reporting as opposed to two-way interaction. Thus, engagement was not perceived as such a critical aspect of web based environmental communication. This explains the moderate use of the personal source and concurrency features of the web as observed during the website analysis.

In the second series of interviews, the interviewees were asked about the lack of use of email alerts after the restructure of their website. They responded that these were not needed since the company now provided ‘live data’ on the website. These views support the emphasis on reporting rather than engagement in Company A’s web based environmental communication practice.

Interviewee A1 highlighted in the final interview that web based environmental communication had to be complemented by other informal approaches to engagement to realise the full benefits of the web. He stated:

*You can’t have a single means of communicating with people. So we would not only ever use the web because there are some things where the web is very useful and you can do it and provide a good level of disclosure. But if it is important to get information to certain people, you need to ring them as well. You need to have direct communication with them through community relation coordinators. So if we had some important environmental information, we would put it on the web but also ring up key stakeholders and let them know – that is part of our stakeholder engagement process.*

*So we have a stakeholder engagement procedure that says that you have to identify your stakeholders, identify how we impact on them and how they can impact on us, and we have a list of things that we send them routinely and we identify non-routine communication. For instance, for a particular stakeholder, we will send them an email advising them that the website has been updated, and we will explicitly ring them if we have a level 2 or 3 environmental incident.*
It is part of our engagement strategy that this person has to be rung if we have a level 3 environmental non-compliance. Our stakeholder management process kicks in at that point. (February 2005)

In summary, in Company A, the interviewees did not place much emphasis on the need for the interactive capabilities of the web compared to other web based environmental communication requirements. This finding was observed consistently in all the interviews and supports the results of the various website analysis stages in relation to the moderate use of the personal source and concurrency capabilities.

7.5.1.5 Summary

Table 7.4 summarises the impact of management’s web based environmental communication needs on the extent of web usage by Company A. The data clearly highlights that timeliness, presentation and organisation, and accessibility were more critical than the need for interaction during the period of analysis in this study. These findings explain the increasing use of the immediacy, language variety, externally recordable and multiple addressability features and the moderate use of multiple cues computer processable memory, personal source and concurrency in the company’s web based environmental communication practice prior to its takeover.

<table>
<thead>
<tr>
<th>Web based environmental communication need</th>
<th>Evidence</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Timeliness</strong></td>
<td>There was a critical need for this requirement, explaining the extensive use of the immediacy feature by the company.</td>
</tr>
<tr>
<td><strong>Presentation and Organisation</strong></td>
<td>This factor was critical, but there was variation in the need for specific features of the web. This finding explained the extensive use of language variety and externally recordable features, varying use of the multiple cues and computer processable memory features and little use of the personal source benefit by the company.</td>
</tr>
<tr>
<td><strong>Accessibility</strong></td>
<td>This factor was critical and was reflected in the extensive use of the multiple addressability feature.</td>
</tr>
<tr>
<td><strong>Interaction</strong></td>
<td>Interactive capabilities were not regarded as critical, resulting in the use of personal source and concurrency features only in relation to emails and feedback forms. Sophisticated tools such as discussion fora, bulletin boards and chatrooms were not utilised by the company.</td>
</tr>
</tbody>
</table>

Table 7.4: The impact of management’s web based environmental communication needs on the extent of web usage in Company A
7.5.2 Contextual influences

As discussed in Chapter Four, management’s needs for communication through the web medium can be influenced by certain contextual factors. Contextual factors include technological limitations, economic factors, internal organisational factors and external stakeholder influences. The influence of contextual factors on the web based environmental communication practice in Company A explored through the interviews, documentary evidence and website analysis, is discussed in the following subsections.

7.5.2.1 Technological Limitations

As discussed in section 4.3, technological limitations which could impact web based environmental communication include security, poor website design and inadequate promotion, doubts over information authenticity on the website and an overload of information on a website. The potential impact of these limitations on web based environmental communication in Company A was explored.

Interviewee A2 indicated that security issues were not a major problem for the company. The company had sufficient funds available to ensure that hacking and electronic viruses would not affect its website. It was mentioned that because the company had a secure network, it had not experienced major problems in relation to unauthorised access.

The interview responses highlighted that the company regarded website design and promotion as critical. These responsibilities fell under the domain of ‘public affairs’ functions. Much effort was spent on designing the website and ensuring that stakeholders could access the environmental information on it easily. Interviewee A2 said:

*We have a website that is user friendly, simple to use, clear, and that people can find information easily.* (May 2004)

*Our labelling of menu items is very clear so that people can find what they are looking for.* (May 2004)

Interviewee A2 stated that simple presentation features and clear hyperlinks and menu items were used to present and organise information. This evidence is also supported by
the use of multiple cues and language variety capabilities on its website, as observed throughout the website analysis.

Feedback on the website was also sought from users. The interviewees mentioned that the company carried out a review of its website every year by seeking feedback from users. A thorough review of the continuous environmental communication web portal was also planned for the future.

The need for the website to be advertised and promoted was acknowledged by the interviewees. They stated that, in the past, the hard copy annual reports and social and environmental reports had reference to the environmental information on the website. Emails and a media release were used to inform stakeholders of its move to a continuous environmental communication web portal.

The interviewees indicated that the authenticity of information on the web could always be questioned by stakeholders. Interviewee A2 remarked:

_There is also the perspective that the web is not formal and reliable. Anything in print is read and believed to be verified._ (May 2004)

The interviews highlighted that adherence to W3C standards was used to provide credibility to the company’s environmental communication. The company also clearly differentiated information on its website from that provided on external websites:

_We also make an effort to differentiate internal and external links as external sites are hosted by other parties._ (Interviewee A2, May 2004)

Moreover, the interviewees revealed that as the company moved to a continuous communication strategy, they were also concerned about the independent attestation of such information. As discussed in section 7.4.1, the company decided that it would archive its website at the end of every year (31 December) and have it verified by independent auditors. This website would then be presented as a separate web portal, clearly indicating that the information on it related to a particular year’s continuous communication. The postscript stage of the longitudinal website analysis confirmed these comments. These findings have implications for other companies that seek to undertake web based environmental communication. They highlight that continuous
communication can also be audited at a particular point in time. This means that stakeholders can rely on the environmental information that is communicated on a regular basis.

The issue of information overload through web based environmental communication was also raised by the interviewees. It was recognised that even though the web had the opportunity to provide disaggregated information, they needed to be careful about overloading their stakeholders with too much information. Interviewee A2 remarked:

Too much information or too less information is always problematic so we have to have a cut-off. Our goal is to communicate any significant environmental issues affecting our company. (May 2004)

Table 7.5 provides a summary of the impact of technological limitations on Company A’s web based environmental communication practice during the period of analysis.

<table>
<thead>
<tr>
<th>Technological Limitation</th>
<th>Evidence</th>
</tr>
</thead>
<tbody>
<tr>
<td>Security issues</td>
<td>Not a major problem for the company.</td>
</tr>
<tr>
<td>Website design and promotion</td>
<td>Website design was perceived as critical, with much effort placed on designing webpages and seeking feedback for the website. The need for promotion of the website was recognised, with media releases, emails, and references to the website in hardcopy reports being utilised.</td>
</tr>
<tr>
<td>Information authenticity</td>
<td>This factor was recognised as a critical issue, with the periodic audit of the continuous environmental communication web portal, distinction between company specific and external information and adherence to W3C standards for website design being utilised.</td>
</tr>
<tr>
<td>Information overload</td>
<td>Perceived as a critical issue but managed through having a ‘balance’ in the information to be communicated.</td>
</tr>
</tbody>
</table>

Table 7.5: Technological limitations that impacted Company A’s web based environmental communication practice

The data indicates that technological limitations were managed effectively by the company, as is evident from the consistent responses throughout all the interviews. Therefore, technological factors did not appear to limit management’s web based environmental communication needs. An increasing emphasis was placed on overcoming these limitations rather than restricting existing communication needs.
7.5.2.2 Economic factors

The cost-benefit nature of web based environmental communication was mentioned at different stages of the interviews:

Move to electronic based sustainability communication is cheaper in the long run. (Interviewee A1, February 2004)

Web based environmental communication is a much cheaper option – you do not pay so much for printing, mailing and design costs. (Interviewee A2, May 2004)

….for the web, the building process is expensive but once set up, costs are very low. (Interviewee A2, February 2005)

The interviewee responses suggest that initial costs for website development and maintenance were compensated by the cost reductions in printing and mailing and the efficiency brought about by web based environmental communication. However, economic constraints led to limited use of advanced stakeholder interactive mechanisms such as bulletin boards, chatrooms and discussion fora. Interviewee A1 explained this restriction:

My response in relation to forums and chatrooms is it is extraordinarily expensive to do it - you have to man it. [Sic] (February 2005)

Thus, as indicated by the website analysis findings in relation to the use of interactive capabilities on websites, a restricted need for interaction could be partially explained by economic factors. However, as discussed earlier, economic factors enhanced the other web based environmental communication needs.

7.5.2.3 Internal organisational factors

As discussed in section 4.3, corporate attitudes towards environmental issues, stakeholders and the communication medium, coupled with the strategic considerations in relation to the use of the web for environmental communication, are internal organisational factors that could impact web based environmental communication. The potential impact of these factors on the practice in Company A was explored.
The archived web portal for social and environmental issues for 2004 included a statement from the CEO of Company A which stated:

*Our commitment to sustainability is now a feature of every aspect of our management approach.*

As indicated in prior social and environmental reports, responsibilities for social and environmental issues were spread throughout the organisation. The board, senior managers as well as line managers and functional staff in the company had extensive social and environmental responsibilities.

In addition to the emphasis on the management of environmental issues as discussed here and in section 7.3, corporate attitudes towards stakeholder issues were also raised in the interviews. The importance placed on stakeholders by the company is exemplified in the following quotes:

... Our licence to operate is dependent to a great degree on the reputation we have with a range of stakeholders. (Interviewee A1, February 2004)

For [Company A], securing our licence to operate is critical to accessing and being able to process and sell mineral resources. Our reputation as a good corporate citizen – as being responsive to broader stakeholder expectations while acting responsibly in the long-term interests of our shareholders, employees and the communities within which we operate – has a strong influence on securing such a licence. (Company A’s 2002 Social and Environmental report)

Given the corporate attitude towards environmental issues and the need to be transparent and open with stakeholders, Company A had an increasing need to communicate with them. The interviewees stressed the need to communicate with their stakeholders in order to gain societal approval for their operations:

*Our prime motivation for communicating environmental information is to provide a balanced, accurate and complete report on our environmental performance. We seek our public reporting to be very open and transparent.*

...We certainly want to provide to stakeholders a true, clear and immediate understanding of our environmental performance. (Interviewee A1, February 2004)
Thus, the company’s history of acknowledging environmental and stakeholder issues as critical had an impact on its environmental communication practice. The evolving nature of environmental communication media suggests that the web was a potential tool that the company could utilise to effectively communicate with a range of stakeholders. This finding is supported by the following quotes from the interviewees at Company A in the later series of interviews:

*The web is a very, very effective means of providing external people with information about your business and we will continue to utilise it to provide it for that purpose. [Sic] (Interviewee A1, May 2004)*

*We use it (the web) to get out in front – when things don’t go according to what we want them to go in terms of some of the operational issues, we get them on the website pretty quickly and acknowledge the issue we have got. We are very positive about the benefits of the use of the web. [Sic] (Interviewee A1, February 2005)*

*The web is a pretty effective system for us. We are pretty happy with it. (Interviewee A2, February 2005)*

Moreover, an email that was sent to stakeholders in order to inform them of the availability of the archived web portal for social and environmental issues for 2004 stated that continuous web based environmental communication evolved in response to stakeholder expectations and the company’s own drive for results. In addition to mentioning the communication potential of the web for environmental communication, the email stated:

*The website also provides increased transparency in the management of the environmental and social issues, outlines our governance processes, approach to external verification and internal controls. (April 2005)*

These findings indicate that Company A considered the web to be a useful tool for communicating its increasing emphasis on environmental and stakeholder issues.

Company A also perceived a leadership role for environmental communication:

*{Company A} continues to help shape sustainable development policies and practices for the minerals industry and sustainability reporting in general. We have again been ranked among industry leaders in the 2001 Dow Jones Sustainability Index. (Company A’s social and environmental report, 2002)*
Being one of the first companies in Australia to undertake environmental reporting, the evolution of environmental communication in the company, as highlighted in section 7.3, suggests that it was expected to also play a leading role in the next wave of environmental communication—web based environmental communication. This matter was clearly summarised in its media release:

_The 2004 approach is a continuation of a ten year reporting journey begun with the release of the 1994-95 Environmental Progress Report, a first for Australia’s Resources sector._ (March 2004)

When Company A moved towards producing summary reports and having detailed information on its website in 2001, a statement in its social and environmental report highlighted that:

_Hopefully, other mineral companies, particularly those with fewer resources, will be encouraged to follow this path by reporting publicly, improved performance and enhancing the mineral industry’s reputation._

Moreover, when the company was about to make the transition to continuous web based environmental communication, Interviewee A1 stated:

_One of the reasons why we are keen for web based communication is that [Company A] was one of the first Australian companies to release a health safety and environment report and we are the leaders in public reporting for quite a time._

_We think that public disclosure is very important. We can understand that when companies had to produce a hardcopy sustainability report, the responsibilities were beyond the capacity of a lot of the smaller companies. We are keen to go down the World Wide Web path because it does demonstrate that there is actually a better way of communication. It is probably within the reach of everyone. We are certainly very keen to communicate our environmental performance and hope this will encourage smaller companies to undertake such communication. We have a leadership role._ (February 2004)

Interviewee A1 indicated that social responsibility analysts were probably the only group that read every page of their social and environmental reports. The company treated social responsibility ratings as critical and used them to highlight its leadership role. For instance, it emphasised its membership of the Dow Jones sustainability index quite extensively and compared its rankings with other leading companies in the minerals industry through its social and environmental reports and website. Improved
ratings in these indices were contingent on the company’s environmental communication. The interviewees stated that the web provided the opportunity for the company to enhance its environmental communication. Therefore, it moved towards web based communication in order to take advantage of its numerous benefits.

The preceding discussion indicates that the use of the web for environmental communication also played a strategic role for the company. Company A aspired to be a strategic leader in web based environmental communication. The interviewees mentioned that by being a leader in web based environmental communication, the company could distinguish its environmental communication from that of its peers. This would enable stakeholders to assess its enhanced transparency and accountability on environmental issues.

In summary, positive corporate attitudes towards environmental issues, stakeholders and the web and a strategic intent in relation to web based environmental communication, as ascertained from documentary evidence and the various interview phases, affected management’s web based environmental communication needs. These findings explain the extensive use of the web for environmental communication, as observed during the website analysis. However, even though most web based environmental communication needs were enhanced by internal organisational factors, a need for interaction was not enhanced.

7.5.2.4 External stakeholder influences

The interviewees revealed that Company A had a range of stakeholders. The local community was regarded as a very important stakeholder for the environmental performance of the company. Other key stakeholders that were mentioned in the interviews included governments and regulatory bodies, non-governmental organisations, employees and shareholders.

The interview responses indicated that the local community appeared to be concerned with environmental issues at the site level while non-governmental organisations and shareholders were regarded concerned about overall environmental performance. Shareholders were mentioned by the interviewees as a critical stakeholder for general environmental issues, especially for financially related matters. Conversely,
governments and employees (local governments and authorities, mining workers) were perceived as being concerned about both mine site environmental performance and general environmental issues. An analysis of the company’s social and environmental reports verified the stakeholders of each company. This indicates that the interviewee responses were consistent with what was discussed in these reports about stakeholders and their importance to the corporation.

The interviewees indicated that an external advisory group was formed in 1997 to provide insights into Company A’s social and environmental disclosure in reports. Thus, the company did not simply undertake environmental reporting but also engaged with its stakeholders in order to provide information geared to their needs in social and environmental reports. However, there was no evidence to suggest that such engagement was systematically undertaken through the use of web based tools.

The interviews highlighted that one of the primary influences on Company A’s decision to undertake continuous web based environmental communication was demand from its stakeholders. Stakeholder demand was clearly articulated in its media release announcing the company’s move towards continuous web based environmental communication:

*Over recent years, our communities have told us that annual reporting is not enough.* (March 2004)

Moreover, Interviewee A2 stressed:

*Stakeholders require relevant, timely information in addition to annual reporting.* (May 2004)

The interviewees also indicated that the company engaged with its external advisory group in order to assess the support for its web based environmental communication strategy. Support from this group paved the way for its continuous web based environmental communication. Interviewee A1 remarked:

*We went through a very long process of an externally advisory group, which shed us the path on the level of communication. This group is a specifically chosen representative body of opinion leaders and stakeholders. The approach to environmental communication is the same but how we communicate has changed.* (May 2004)
The interviewees also indicated that they sought the support of non-governmental organisations (NGOs) and social responsibility analysts through their web based environmental communication. They indicated that these stakeholders required increasing environmental information and that, by having such information on their website, they were able to enhance their reputation in relation to social and environmental issues.

The Australian minerals industry also influences the web based environmental communication practice of companies in its industry. As discussed in section 6.2, an unstructured interview with its sustainable development officer suggested that the industry association was encouraging companies to undertake web based environmental communication because this activity could enhance their communication with stakeholders. The interviewees acknowledged that the MCA encouraged the electronic communication of environmental issues by its member companies.

The critical importance attached to NGOs, social responsibility analysts and the MCA by Company A provides empirical evidence of the management of stakeholder networks (Rowley, 1997) by organisations. Corporations rely on these to gain the support of a broad range of stakeholders that have a relationship with such networks.

The interviewees mentioned in the last interview that the only feedback they received after the continuous web based environmental communication practice became operational was from regulators satisfied with the company’s practice. Interviewee A1 indicated that the company was considering undertaking community perception surveys in the future in order to gain an understanding of stakeholder experiences in relation to continuous web based environmental communication.

Stakeholder preference and competence was considered in the interviews. The interviewees contended that in some instances or in relation to certain stakeholders print media was the preferred medium for communication. Interviewee A2, however, stated that the limitations of electronic media were not always critical given that the distinction between the web and print media is not as rigid as it used to be:

*It depends on access and preference – some people like to have something straightaway – however, with the ease with which web documents can be printed*
As indicated earlier, the company considered stakeholder preference and competence when designing its website. This consideration included limiting presentation features that could impede access speed, having clear hyperlinks and menus that are easy to navigate and enabling the downloading and printing of information. Stakeholder feedback was also often sought for the website.

Stakeholder preference and competence was regarded by the interviewees as critical to the use of the interactive capabilities of the web. Interviewee A1 mentioned that the traditional means of engaging with stakeholders were more useful than utilising web based tools:

*The website is just one medium we use. For some of our stakeholders, the most effective way of getting feedback is one-on-one conversations – they do not read things, they do not access the web but they will sit down and talk to somebody.*

(February 2005)

This statement highlights that even though the web was critical to Company A’s environmental communication, there was general reluctance to utilise its interactive benefits due to the needs of certain stakeholder groups. As highlighted in section 7.5.1.4, traditional means of engagement with stakeholders was considered appropriate for web based environmental communication in the company.

In summary, the evidence from the various phases of the interviews presented here suggests that stakeholder demand affected management’s web based communication needs. This led to an increasing need for timeliness, accessibility, and presentation and organisation capabilities. However, it appears that the impact of stakeholder demand on interaction was minimal. This led to the restricted need for interactive capabilities associated with web based technologies. Moreover, stakeholder preference and competence limited the need for interaction.

The findings in relation to external stakeholder influences are in line with the extent of web usage for Company A as observed during the website analysis. Stakeholder demand for timely communication led the company to adopt continuous web based environmental communication from March 2004. Other needs for web based
environmental communication also appeared to be enhanced by stakeholder influences. The exception was interaction. The interviewees perceived that stakeholder preference and competence restricted the need for interaction, even though these factors did not restrict the disclosure of environmental issues on its website. This impediment led to the limited use of the personal source and concurrency features, as observed during the various website analysis stages.

### 7.5.2.5 Summary

<table>
<thead>
<tr>
<th>Contextual influence</th>
<th>Evidence</th>
</tr>
</thead>
<tbody>
<tr>
<td>Technological limitations</td>
<td>These were effectively managed by the company and did not impede current web based environmental communication practices.</td>
</tr>
<tr>
<td>Economic factors</td>
<td>The web was perceived as a cost beneficial medium for environmental communication. Savings could arise from placing information such as reports on the website and limiting the hardcopy distributions. However, economic issues constrained the use of advanced tools for electronic interaction.</td>
</tr>
<tr>
<td>Internal organisational factors</td>
<td>Positive attitudes towards environmental issues, stakeholders and evolving nature of communication provided an impetus for undertaking continuous web based environmental communication. The company also perceived a strategic leadership role in relation to web based environmental communication. Being a leader in environmental reporting, it aspired to be a leader in the evolution of environmental communication through the web.</td>
</tr>
<tr>
<td>External stakeholder influences</td>
<td>Stakeholder demand assessed through its external advisory group and from its stakeholder networks, as well as industry association encouragement, led to continuous web based environmental communication. Stakeholder preference and competence for web based environmental communication was perceived as an issue that could be managed in relation to most of the communication requirements, the exception being interaction.</td>
</tr>
</tbody>
</table>

**Table 7.6: The impact of contextual influences on web based environmental communication in Company A**

Table 7.6 summarises the contextual influences on Company A’s web based environmental communication practice. Technological limitation had a minimal impact on web based environmental communication. Economic factors, internal organisational factors and external stakeholder influences enhanced management’s web based environmental communication needs in relation to timeliness, accessibility, and
presentation and organisation. Interaction was, however, restricted by economic factors and external stakeholder influences.

7.5.3 Emerging themes

Two critical influences were identified from the ‘field’. These are referred to as the double-edged sword and change in management philosophy.

7.5.3.1 Double-edged sword

The double-edged sword implies that even though the communication potential of the web is beneficial in many instances, these same benefits can be limitations in other instances. A number of issues raised in the interviews suggest that the communication potential of the web could not be realised in all situations.

Interviewee A2 mentioned that the benefit of having timely communication could be negated by getting immediate feedback from stakeholders:

A strength of the web, which is also a limitation, is that it is responsive – you get immediate feedback. (May 2004)

The interviewees stated that expectations from stakeholders for real-time communication due to the web’s timeliness capabilities cannot be continually managed by companies. Therefore, immediacy in communication is not always desirable from a corporate perspective. The companies were not equipped to handle real-time communication within the context of environmental communication.

It was also highlighted in the interviews that the accessibility potential of the web could not be realised if stakeholders did not have access to the web:

With Internet communication, there is less of an issue of identifying stakeholders. We communicate to everyone. Having said this, you may disadvantage some people who do not have access to the Internet.

The biggest challenge is assuming that the web is far-reaching. We still need to go out and meet people on a one-to-one basis, irrespective of how good the website is and how regularly information is updated.
If you sit back and assume that everyone is accessing the web and using the information, then you are kidding yourself. (Interviewee A1, May 2004)

Thus, the interviews at Company A highlight that even though a need for timeliness and accessibility was critical for its web based environmental communication practice, the interviewees were also aware of the downside to recognising these needs. The double-edged effect of web based environmental communication was, however, controlled by the company. This is evident from the increasing use of the multiple addressability feature, observed during the various website analysis stages, and the use of the immediacy feature from the second stage of the longitudinal website analysis.

### 7.5.3.2 Change in management philosophy

A change in management philosophy also had an impact on web based environmental communication practice. Company A had a change in management in early 2003 when its long-serving CEO retired (Social and Environmental Report, 2003). Another change in management occurred in 2005 as a result of the company’s takeover (Company A media release, 2005). Its CEO and board resigned and were replaced by the takeover organisation’s management. The company’s identity ceased to exist after the takeover because its operations were incorporated into the takeover company’s.

An analysis of documents associated with the minerals industry and Company A highlighted that positive corporate attitudes towards environmental issues and stakeholders were led by their former CEO. In the company’s 2001 social and environmental report, the former CEO of the company stated:

> We have clearly moved from a world of ‘tell me’ to ‘show me’ and now to one of ‘involve me’.

The interviewees highlighted that this individual was responsible for transforming the company’s approach towards environmental management and stakeholders and placing an increasing emphasis on economic, social and environmental issues within the organisation.

It appeared that the new CEO continued to maintain the high standards of environmental management and transparency for the company. This finding is supported by evidence of the company’s commitment to environmental communication.
This is indicated by the similarity of the social and environment reports and website before and after 2003.

As discussed in section 7.4.2.3, the company continued to seek to be a leader in environmental communication by adapting to the changing role of media and undertaking continuous web based environmental communication. The interviewees revealed that there was support from top management for web based environmental communication, enabling the online continuous strategy to be undertaken. Interviewee A1 remarked:

_They are obviously for it – if they were not for it, we would not do it. They are very supportive of this and they see the benefits of doing this. This was part of a broad improvement strategy and they came on board pretty quickly._ (February 2005)

Thus, this change in management did not lead to a change in the environmental communication philosophy. However, the takeover in June 2005 and the resulting change in management did result in a change to the corporate communication philosophy.

After the completion of the data collection for this research, Company A was taken over. The interviews indicate that the company was subject to a takeover bid. However, the interviewees felt that this bid would not affect its web based environmental communication practice. They stated that ‘it was business as usual’ (February 2005). However, as established in the postscript stage of the longitudinal website analysis, the company’s website no longer exists. Thus, the impact of the takeover for Company A was similar to that of the other local company that was taken over during the general website analysis. These companies have not retained their organisational identity. Therefore, their web based environmental communication practices ceased42.

Documentary evidence and the postscript stage of the longitudinal website analysis suggested that the change in management was accompanied by a completely different philosophy to environmental communication. Environmental communication needs for Company A were merged into the overall company’s approach to environmental communication. This led to an abandonment of the continuous web based 

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42 Requests for an interview with the new management to explore the impact of the takeover on web based environmental communication were turned down.
environmental communication practice. Environmental issues associated with Company A became part of its parent company’s environmental communication in hardcopy and web based formats.

7.6 Summary

This chapter has highlighted that Company A undertook continuous environmental communication through its website in the period from March 2004 to April 2005. Its experience in relation to web based environmental communication provides useful insights into contemporary practices. The extensive use of immediacy (from the second longitudinal website analysis stage onwards), language variety, multiple addressability, and externally recordable features, together with some use of multiple cues and computer processable memory features, characterised its web based environmental communication. Personal source and concurrency features of the web were also moderately utilised by the company. This led to electronic interaction only through emails and feedback forms.

Management’s web based environmental communication needs in relation to timeliness, accessibility, and presentation and organisation explained the extent of web usage. These needs were enhanced through economic factors; positive corporate attitudes and a strategic intent in relation to web based environmental communication; and external stakeholder demand. Economic factors and stakeholder preference and competence, however, constrained the need for interaction. Even though technological limitations and the double-edged sword nature of communication needs were managed by the company, a change in management philosophy explains the company’s abandonment of the web based environmental communication practice. Figures 7.5 and 7.6 summarise the factors that affected Company A’s web based environmental communication practice.
Figure 7.5: Factors impacting Company A’s web based environmental communication practice prior to its takeover
Figure 7.6: Major factor impacting Company A’s web based environmental communication practice after its takeover
Chapter Eight: Web based environmental communication in Company B

8.1 Introduction

This chapter presents the findings in relation to Company B. Section 8.2 discusses the specific data sources for this case. The next section focuses on the contextual background for the case by providing an overview of the company’s environmental issues and environmental communication practices. Section 8.4 addresses the first research theme—the extent of web usage—through an analysis of the data collected from the initial interviews, documents and longitudinal website monitoring. Media Richness Framework features are used to assess the extent of web usage. Section 8.5 addresses the other research themes—management’s web based environmental communication needs, contextual factors and emerging themes—in order to establish the factors influencing the extent of web usage. Interviews and documents, which were supported by the website monitoring findings, were used in this analysis. In section 8.6, the findings for this case are interpreted in terms of the research model and extensions to this model are suggested.

8.2 Data Sources

As highlighted in section 5.5, longitudinal website monitoring, interviews and documents were used to collect data for the company specific phase of the research. These data were analysed in relation to the research objectives for this study; the extent of web usage and factors influencing this usage. The specific research themes outlined in section 4.4 guided the analysis.

The longitudinal website analysis for the company was organised in several stages. The initial structure of the website on 31 December 2003 provided the basis for ascertaining the changes made to the website over the year. Company B had its website taken offline on 31 January 2004. Even though the website was online from 15 February 2004, limited information was provided on it in relation to environmental issues.
situation persisted until a restructure of its website took place on 8 March\textsuperscript{43}. Therefore, details of the developments on the website at the end of January, its restructure and subsequent changes on the website until the end of the year represented the second stage of the website analysis. The timelines for the longitudinal website analysis for Company B were 31 December 2003–30 January 2004, and 31 January 2004–31 December 2004.

The general website analysis findings in relation to Company B, as discussed in Chapter Six, were used in conjunction with the longitudinal website analysis results to assess the extent of web usage. However, a postscript stage (1 January 2005–September 2007) was used to identify any significant issues related to web based environmental communication arising after the longitudinal website monitoring ceased at the end of 2004. This enabled a complete account of the company’s practice to be ascertained.

<table>
<thead>
<tr>
<th>Interviewee</th>
<th>Position</th>
<th>Job responsibilities in relation to environmental communication</th>
</tr>
</thead>
<tbody>
<tr>
<td>B1</td>
<td>Manager Environment</td>
<td>Assisted the general manager environment with environmental communication.</td>
</tr>
<tr>
<td>B2</td>
<td>Manager - Communications</td>
<td>Used to coordinate the public environmental communication process. More recently, had to liaise with personnel at the parent company headquarters.</td>
</tr>
<tr>
<td>B3</td>
<td>General Manager Environment</td>
<td>Provided environmental information for communication purposes.</td>
</tr>
</tbody>
</table>

Table 8.1: Company B Interviewee Profiles

Table 8.1 provides details of the profiles of the interviewees for this study. The environmental and communication sections were in charge of web based environmental communication in Company B\textsuperscript{44}. Emphasis in this research was on seeking the views of those personnel who had a critical role in web based environmental communication. An initial interview with the Environment Manager (Interviewee B1) also led to an interview with the Manager Communications (Interviewee B2), largely due to her critical role in the company’s environmental communication practice. These initial interviews were followed by additional interviews with both Interviewee B2 as well as the General Manager Environment (Interview B3). Interviewee B3 had overall

\textsuperscript{43} Both Companies A and B had a restructure of their website on 8 March 2004. However, this was merely coincidental and was in no way related to any major event in the minerals industry.

\textsuperscript{44} Further details are provided in section 8.4.1.
responsibility for social and environmental issues in the company. He also had a role in the web based environmental communication practice. A total of six interviews were held at Company B from February 2004 to January 2005—one with Interviewee B1, three with Interviewee B2 and two with Interviewee B3.

The initial interview data provided an overview of web based environmental communication in Company B. The analysis of data from all three interview phases focused on the factors influencing the use of the web for environmental communication. This was guided by the extent of web usage identified through the general and longitudinal website analysis. If any factors explained the events of the postscript stage, these were also discussed.

- Annual Report, Local Company, 2001
- Annual Report, Parent company, 2002-2004
- Social and Environment Report, Local Company, 2001
- Parent company Social and Environmental Report, 2002-2004
- Environmental Policy, Local and Parent company (2004).

Figure 8.1: Documents accessed in Company B

Figure 8.1 lists the documents that were accessed in relation to Company B. All the documents were publicly available on the company’s website. These documents provided a contextual background for the case in section 8.3, enabling useful insights to be gained in relation to the critical environmental and stakeholder issues for the company. The documents were also used in some instances to corroborate evidence from the other data collection sources—namely, website monitoring and interviews.

The company’s annual reports and social and environmental reports were available from 2001. As the company was taken over in 2002, reports after 2002 were available for the parent company. These contained some information related to local operations. All these reports were analysed, as discussed in section 5.6.2. Social and environmental policies and standards were available for the local company and these were compared to those of the parent company. In 2003, a paper was presented on environmental reporting in Company B at the Minerals Council of Australia (MCA) sustainable development
conference. This paper was also analysed because it provided useful insights into the company’s environmental communication practice.

8.3 Contextual Background

The social and environmental reports indicate that the company’s mining operations affect the land and biodiversity and create waste rocks and tailings. The reports also highlight that these operations use vast amounts of natural resources, such as water and energy, and can potentially produce water and air pollution. Rehabilitation of mine sites is another environmental issue of concern to the company, as identified in these reports. In addition, the gold mining process utilises cyanide. Its management is critical for the company in order to avoid other potentially serious environmental impacts being created through the use of cyanide (Social and Environmental Report, 2001).

The social and environmental report for 2001 reveals that the company responded to its social and environmental challenges by establishing a management system for all its mining sites. This is referred to as a five-star integrated management system. This management system was based on the International Standards Organisation (ISO) and AA1000 standards and was adopted from 1998. Every site was required to manage its social and environmental issues effectively. A five-star assessment system was used by external assessors to evaluate their performance. A ranking scale from one to five was used, with five representing ideal performance. The system required continuous improvement. All sites were provided specific social and environmental performance targets for successive periods.

The five-star assessment system required the management of all critical environmental impacts (MCA conference proceeding, 2003). Eco-efficiency in relation to water and energy usage was an integral part of this assessment. The system also required a ranking of environmental incidents in relation to their severity. A scale of one to five was used for this purpose. Mine closure and reclamation were regarded as critical issues in addition to the management of cyanide.

As indicated by the social and environmental reports of the parent company, Company B’s five-star assessment system was adopted by its parent company after the takeover.
Thus, the local company influenced its parent company’s approach towards environmental management.

The company also had an annual director’s environmental awards incentive to encourage the various mine sites to improve their environmental performance (Social and Environmental Report, 2001). In addition to the prestige associated with winning this award, it encouraged improvement in environmental performance at the various mine sites.

The social and environmental reports revealed that Company B was involved in a number of mandatory and voluntary environmental initiatives in addition to its increasing emphasis on its internal environmental management structures. These initiatives included the National Pollutant Inventory, Greenhouse Challenge program and the Cleaner Production initiative of the Western Australian government. The company was a participant in the Global Mining Initiative and the mining certification evaluation program. It had also signed up to the MCA environmental management code and its successor, Enduring Value. The company was the only Australian mining company to develop its own cyanide management standard. This standard was based on the international cyanide management code developed by the United Nations Environmental Program (UNEP) and the International Council of Metals and the Environment (ICME) in response to the highly publicised disaster that occurred at the Baia Mare mine site in Romania in 2000 (UNEP, 2000).

The MCA conference proceeding (2003) highlighted that Company B placed much emphasis on its annual social and environmental report, which was prepared from 1998 onwards as part of the obligations for the MCA’s code of environmental management. It was mentioned that the approach towards environmental communication was to produce a general corporate report that provided information on the overall environmental performance of the company in conjunction with individual reports of every mining site, which could target local stakeholders. An overview of the parent company’s social and environmental reports indicated that this process was also adopted by the parent company after the takeover. This suggests that it realised the benefits of this approach in communicating with stakeholders.
Company B was one of the Australian mining companies regarded as having data rich social and environmental reports in the Peck and Sinding (2003) paper. This indicates the critical importance it placed on environmental disclosure. It was also highly ranked in the ‘Ore or Overburden’ survey (WWF, 2000), which was discussed in section 5.3.

8.4 The Extent of Web Usage

Company B’s extent of web usage for environmental communication was explored through the initial interviews, documents and website analysis. The interviews and documentary evidence were used to establish the role of the corporate website in environmental communication and identify the personnel and processes involved in web based environmental communication. The longitudinal website analysis was used to ascertain the extent of web usage for environmental communication over time.

8.4.1 An overview of web based environmental communication

It was indicated in the initial interviews that Company B’s environmental communication was primarily through its periodic social and environmental reports, which were hosted on the website. The website provided additional environmental information in relation to environmental policies and initiatives. For instance, the 2001 corporate report for social and environmental information had references to the website, where further information could be obtained for specific social and environmental issues. This evidence suggests that the company was considering an increasing use of the web for environmental communication.

The initial interviews highlighted that the Manager Communications (Interviewee B2) played a vital role in the web based environmental communication practice. This role extended beyond merely providing support to the environmental personnel. She actually coordinated the environmental communication practice. Moreover, she was the first point of contact for stakeholders who had queries about the social and environmental reports. The Environment Manager (Interviewee B1) stated that environmental staff under the leadership of the General Manager Environment (Interviewee B3) provided information for environmental communication. The interviewees revealed that as Company B is a branch of a multinational, the parent company personnel were also involved in web based environmental communication.
Interviewee B1 stated that Interviewee B3 and other corporate environmental staff were extensively involved in providing information for environmental communication. They liaised with site managers and passed the environmental information to communications staff, who, under the control of Interviewee B2, ensured that the environmental information could be easily understood by stakeholders. Staff involved in corporate communications also included those involved in website design and information technology support.

The interviewees indicated that, in addition to these routine processes for web based environmental communication, the headquarters in the US played an instrumental role in relation to what appeared on the website. Information to be communicated on the local website went through a thorough vetting process. Interviewee B2 (February 2004) stated:

Quite stringent vetting processes are in place. For any change or addition to the website, we have to fill out a form. A person at headquarters who is responsible for the websites coordinates the sign-offs by the relevant interest groups within the organisation. For example, the legal department, industrial relations department or environment department have to finalise the content that relates to them and, once they have signed off to the addition or change to the website, it can be loaded on the website. So it is quite a rigorous process. A formal process where forms have to be filled, then it goes through the heads of the relevant departments who have to sign it off, indicating their approval, before it goes on the website.

The interviewee revealed that, for periodic communication, the board of directors of the parent company were also involved.

Figure 8.2 summarises the web based environmental communication process in Company B, as established in the initial interviews. The figure highlights the extensive involvement of the communications and environmental personnel in web based environmental communication. This supports the selection for interview of those in charge of these processes. However, even though these personnel had extensive involvement, the control over what appeared on the website rested with the parent company. Parent company personnel declined requests for an interview.
Figure 8.2: The web based environmental communication process in Company B (February 2004)
8.4.2 Longitudinal website analysis

8.4.2.1 Stage one – 31 December 2003–30 January 2004

8.4.2.1.1 Initial Structure –31 December 2003

Company B utilised the web for local environmental communication even though it had been taken over by a foreign multinational. It had a specific section on its website entitled ‘Social Responsibility’, where the communication of environmental issues was quite prominent (see Figure 8.3). A specific section entitled ‘Caring for the Environment’ provided extensive details on environmental issues.

<table>
<thead>
<tr>
<th>Our social responsibility</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Information and link to most recent social and environmental report</td>
</tr>
<tr>
<td>• Information and link to Safety, Health and Environment awards</td>
</tr>
<tr>
<td>• Link to 2001 Safety, Health and Environment Awards with hyperlink provided to information on it being ranked fifth among top 50 in the world by UN’s sustainability investment research institute</td>
</tr>
<tr>
<td>• Information and link to information on the winning of an environmental excellence award by one of its operations</td>
</tr>
<tr>
<td>• Information and link to its multimedia and training program, ‘Bridging Cultural Gaps with niCCi’</td>
</tr>
<tr>
<td>• Information and hyperlink provided to information on the company’s nomination for sustainable company awards with mention of it as the only Australian company being nominated</td>
</tr>
<tr>
<td>• Information on the takeover of the Australian operations</td>
</tr>
<tr>
<td>• General information on social responsibility</td>
</tr>
<tr>
<td>• Hyperlinks for In the Community, Caring for the Environment, Indigenous People, Employee Wellbeing and Recruitment Opportunities</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Caring for the environment</th>
</tr>
</thead>
<tbody>
<tr>
<td>o Policy and standards</td>
</tr>
<tr>
<td>o Audit and assessment</td>
</tr>
<tr>
<td>o Performance reporting</td>
</tr>
<tr>
<td>o Good news and awards</td>
</tr>
<tr>
<td>o Eco-efficiency</td>
</tr>
<tr>
<td>o Greenhouse/energy management</td>
</tr>
<tr>
<td>o NPI data</td>
</tr>
<tr>
<td>o Comments and feedback</td>
</tr>
<tr>
<td>o Related links</td>
</tr>
</tbody>
</table>

Figure 8.3: The structure for Company B’s environmental information contents on its website as at 31 December 2003
The company did not have a specific web portal for its social and environmental report. However, it had an archived section which provided corporate and site level social and environmental reports. In addition to environmental policies, standards, performance and initiatives, the company provided information on audits and assessments as well as environmental news such as environmental awards.

A comments and feedback section enabled electronic feedback for its annual social and environmental report to be obtained. This section also provided contact details (including an email address) for the company’s General Manager Environment. Moreover, a link provided information on the company’s scorecard in relation to the World Wide Fund for nature (WWF) ‘Ore or Overburden’ survey. This highlights that the company was willing to share such information with its stakeholders.

8.4.2.1.2 Changes during 1 January–30 January 2004

No major changes occurred during this period. Company B’s website structure was static. The initial interviews therefore attempted to gain insights into potential future developments in relation to the company’s website.

8.4.2.2 Stage two – 31 January–31 December 2004

8.4.2.2.1 Change and restructure of website – 31 January–8 March 2004

On 31 January 2004, Company B’s website was taken offline. Whenever the URL of the company’s website was typed, the parent company’s website would open. This situation persisted until 15 February, when the local website was back online. However, the new local website had restricted information. The website had two key hyperlinks—a link to the global website and a link for graduate recruitment opportunities in the local company. The site was restructured on 8 March 2004 to include financial, social and environmental issues. However, there was a significant reduction in the information being communicated compared to the information on its website at the beginning of the year.

Much of the social and environmental information appeared on the global website. This represented the entire operations of the company. This information included environmental policies and standards, audit and assessment, general environmental
performance information, and past reports and other key documents. There were some references to this information on the local website through hyperlinks to the global website. Figure 8.4 provides details of the restructured local website.

<table>
<thead>
<tr>
<th>Safety and Health</th>
</tr>
</thead>
<tbody>
<tr>
<td>Community Relations</td>
</tr>
<tr>
<td>Environmental Management</td>
</tr>
<tr>
<td>- Initiatives</td>
</tr>
<tr>
<td>- Case Studies</td>
</tr>
<tr>
<td>- Awards</td>
</tr>
<tr>
<td>Employee Wellbeing</td>
</tr>
</tbody>
</table>

**Figure 8.4: The contents of Our Social Responsibility section of Company B’s new website from March 2004**

A feedback form for the social and environmental reports on the local website was the only mechanism that could be used by stakeholders to contact the company. However, all information provided in the feedback form went to the global headquarters rather than local personnel.

An interesting feature of Company B’s overall website was the appearance of major sections for legal and privacy issues. It seems that these sections were developed because the website and its contents were now representative of the entire global group. These elements of the local website are indicative of the change in emphasis for information dissemination. It suggests that legal and privacy issues were of critical importance to the parent company.

8.4.2.2.2 Changes to website – 9 March 2004–31 December 2004

Company B’s website remained stagnant after its site restructure in March 2004. Table 8.2 provides specific details of the limited changes that took place during the year.
<table>
<thead>
<tr>
<th>Date</th>
<th>New Information</th>
<th>Issue</th>
</tr>
</thead>
<tbody>
<tr>
<td>21 May 2004</td>
<td>• The 2003 social and environmental reports of the parent company as a whole and all its divisions (including Australia) are provided on the global website.</td>
<td>General environmental</td>
</tr>
</tbody>
</table>
| 22 September 2004    | • A direct link within the local main page to social and environmental reports had the most recent reports as well as archived reports available.  
• The latest news section on the local website had an archive of social and environmental presentations of the company. | General environmental |

Table 8.2: Changes on Company B’s website in relation to environmental issues – March – December 2004

A major change occurred in May, when the parent company released its social and environmental reports.\(^{45}\) Reports on the Australian operations were available for download on the global website. These were later available on the local website.

Towards the end of the year, the company provided information on the social and environmental presentations made by corporate executives in Australia. It appears that the company had a number of restrictions on information dissemination through its website. It attempted to resolve this limitation by providing annual social and environmental reports about Australian operations for download and making social and environmental presentations to its various stakeholders. These were later archived on its website. However, the social responsibility or environmental sections were not updated to reflect these changes. There were also no hyperlinks from these sections to the sections of the website where associated changes were made.

\(^{45}\) The initial interview indicated that Company B’s annual social and environmental reports were released in May. Thus, the parent company’s website was also monitored in this month, given that the website analysis from March had highlighted that a lot of the general environmental issues were being communicated on the global website.
8.4.3 Overall web usage

Having explored the web based environmental communication practice, the extent of web usage can be ascertained. Media Richness Framework features were applied to the findings related to Company B’s practice, as observed during the general website analysis (Chapter Six) and the two stages of the longitudinal website analysis. Table 8.3 summarises the extent of web usage in relation to the Media Richness Framework features. These are discussed subsequently.

<table>
<thead>
<tr>
<th>Media Richness Framework feature</th>
<th>Evidence</th>
</tr>
</thead>
<tbody>
<tr>
<td>Immediacy</td>
<td>Web based environmental communication was primarily restricted to release of periodic reports, with some ad hoc changes taking place on the website. The immediacy of environmental information declined during the period of analysis.</td>
</tr>
<tr>
<td>Multiple Cues</td>
<td>Presentation flexibility mainly limited to pictures and graphics. Multimedia and animation features were not evident.</td>
</tr>
<tr>
<td>Language Variety</td>
<td>Hyperlinks and menus were used to organise environmental information on the website. A separate web portal did not exist for environmental issues.</td>
</tr>
<tr>
<td>Personal Source</td>
<td>Email alerts existed for corporate issues. Hyperlinks were not used to provide specific information for each stakeholder. Emails and feedback forms were primarily used to enable a personal source for stakeholders but their usage declined during the period of analysis.</td>
</tr>
<tr>
<td>Multiple Addressability</td>
<td>The mass communication and global reach of the web was utilised by the company to store critical environmental information such as periodic reports.</td>
</tr>
<tr>
<td>Externally Recordable</td>
<td>Current and prior reports were available on the website and these could be printed and downloaded.</td>
</tr>
<tr>
<td>Computer Processable Memory</td>
<td>A search engine was available on the website. Analytical tools were not utilised.</td>
</tr>
<tr>
<td>Concurrency</td>
<td>Emails and feedback forms facilitated interaction with stakeholders but their usage declined during the period of analysis.</td>
</tr>
</tbody>
</table>

Table 8.3: The extent to which the web was utilised for environmental communication by Company B in relation to the Media Richness Framework features, as at 31 December 2004

The findings from the general website analysis and the first stage of the longitudinal website analysis (31 December 2003–30 January 2004) highlight that the company was not undertaking web based environmental communication on a regular basis. This finding was also confirmed in the second stage (31 January–31 December 2004). The company’s environmental communication through the use of its website was ad hoc.
The website mainly provided periodic reports. It was observed during the second stage of the longitudinal website analysis that there was a delay in making these reports available on the local website. Thus, the immediacy feature had limited use and gradually declined in usage over the period of analysis.

As is evident from the website analysis stages (general website analysis and both stages of the longitudinal website analysis), graphics were used on a small scale and multimedia and animation features were not utilised. This evidence highlights that the company had limited use of the multiple cues feature.

The company utilised its website primarily to organise environmental information. Hyperlinks and menus were used extensively for environmental communication, as initially observed during the general website analysis and the first stage of the longitudinal website analysis. However, their usage declined after the restructure of the company’s website due to the reduction in the environmental information that was communicated. A specific web portal for social and environmental reports did not exist. Thus, the language variety feature was utilised moderately.

The various website analysis stages indicated that the company’s web based environmental communication was directed at general stakeholders. It did not provide specific information geared to the needs of different stakeholder groups through the use of hyperlinks and menus. Email alerts mainly existed for corporate rather than environmental issues. The only personal source features available on its website were its email and feedback forms facility, as observed during the general website analysis and the first stage of the longitudinal website analysis. There was only a feedback form to its headquarters in the US, as observed in the second stage of the longitudinal website analysis. Thus, the personal source feature had limited use and declined in usage over the period of analysis.

The use of the web for environmental communication was primarily to provide access to the company’s social and environmental reports. Thus, the multiple addressability of the web was extensively used to communicate environmental issues to numerous stakeholders, as observed during the various website analysis stages.
Social and environmental reports were available for download and printing on the local website. These were available for the period 2001 onwards, highlighting that archived information was available. Thus, the website analysis stages highlight that the externally recordable feature was utilised extensively for web based environmental communication.

A search engine was available for the company’s overall website. Analytical tools, such as electronic tools which could enable stakeholders to analyse the existing environmental information on the basis of their different information needs, were not available on the website. These findings highlight a moderate use of the computer processable memory feature, as observed consistently during the various website analysis stages.

As initially observed during the general website analysis and the first stage of the longitudinal website analysis, emails and feedback forms were utilised by the company. Email facilities on the global website and feedback forms on the local website (under the control of the corporate headquarters) were primarily used to enable electronic engagement with stakeholders in the second stage of the longitudinal website analysis. Other means of electronic interaction with stakeholders was not evident from the website analysis. These findings highlight that concurrency had a low usage and that this gradually declined over the period of analysis.

8.4.4 Postscript – 2005–September 2007

Certain events took place beyond the detailed period of analysis which had implications for this study. Company B’s website continued to have limited communication of environmental issues, as initially observed during the longitudinal website monitoring in 2004. More recently, the company’s local website was taken offline. This finding was confirmed by Interviewee B2. The only possible avenue to access social and environmental information for Company B was through the parent company’s website, which had a section on the operations of each of its subsidiaries. Social and environmental information could be obtained here in addition to other corporate information.
8.5 Factors Influencing Web Based Environmental Communication

Having established the extent of web use for environmental communication, the factors that could explain this usage were investigated. The research model and themes guided this process but, in line with the case study approach, findings from the field had the potential to extend the model. Management’s web based environmental communication needs are considered before contextual influences are discussed. Emerging themes were identified that extended the research model, and they are also discussed.

8.5.1 Management’s web based environmental communication needs

Management’s needs for environmental communication through the web medium were identified through the interviews with the interviewees B1, B2 and B3. The impact of these needs on the extent of the use of the web, established through the website analysis (general and longitudinal), was then ascertained.

8.5.1.1 Timeliness

In the initial interviews, the interviewees acknowledged the benefit of providing timely and updated information through the web. For instance, Interviewee B1 remarked:

*It is starting to get to a point where we can communicate performance on an ongoing basis rather than annual. We can update performance information or anything of relevance any time. Reporting timeframe is starting to change and will change.* (February 2004)

Interviewee B2 stated:

*The World Wide Web is instantaneous, real-time and the first point of contact for anyone.* (February 2004)

The initial interviews therefore indicate that it was possible for Company B to undertake regular environmental communication through its website in the future, given the acknowledgement by management of the potential offered by the web for enabling timely communication.

Despite this, responses from the second and third series of interviews suggested that managers at the company did not need timely communication through the web. It was
felt that periodic and ad hoc information was sufficient for the needs of stakeholders and that the web could be used to release such information, thereby enabling immediacy in information dissemination at that time. Interviewee B2 remarked:

*Environmental information actually goes on the web once a year and that is in the format of a sustainability report, which provides details of the performance of our mine sites in a calendar year.*

*Certainly with quarterly report presentations, they would go on the day it happens and, again, they could include environmental information. Environmental information is not specifically communicated on an ongoing basis.*

*The information on our website related to the environment is more about policy issues and ongoing programs so there is really not a great need to update them on a regular basis.* (July 2004)

This viewpoint reflected the company’s web based environmental communication practice, especially during the second stage of the longitudinal website analysis whereby even periodic social and environmental reports had time lags in relation to their dissemination on the website. Thus, timeliness was not that critical to Company B’s web based environmental communication needs. This explains the low usage of the immediacy feature.

### 8.5.1.2 Presentation and Organisation

The interviewees were cautious about the impact of their web based presentation needs, as is evident from their responses in all the interviews. They stated that certain presentation tools could affect the accessibility of the website. The company therefore did not need all of the multiple cues features. Interviewee B2 posited:

*We use basic features like graphics for the web.* (July 2004)

This finding was reflected in actual practice. The various website analysis stages highlighted that while graphics and pictures were used on a small scale, animation and multimedia features had restricted use. Thus, the need for the web to enhance presentation was limited in the company.
The organisation of information storage on the website was perceived to be an important element in the company’s use of the web for environmental communication. Interviewee B1 remarked:

… the Internet is limitless – you can place a lot of detail on it. (February 2004)

Interviewee B3 stated:

All the information is available in one place on the website. (July 2004)

Hyperlinks and menus were found by the interviewees to be useful in organising environmental information through the website. However, web portals were not needed. Interviewee B2 stated:

All of our website is navigational. We have a section on social responsibility that includes all of our environmental information. (July 2004)

As the company relied on its hardcopy reports, a portable document format (PDF) version was used in place of tools such as web portals. This provided a further means of enhancing the organisation of environmental information. Thus, language variety was useful to the company, as is evident from the views of the interviewees throughout all the interviews. This need was reflected in the company’s web based environmental communication practice, observed during the website analysis.

The dynamic nature of the web was acknowledged in the interviews. Interviewee B2 stated that a benefit of the web was:

We can change information regularly if we want to, unlike in print media. (July 2004)

The benefit of having archived information on the website was perceived as important. The interviewees also mentioned that tracking software was helpful in assessing trends in the use of the website by stakeholders. Interviewee B2 remarked:

What we can get from our tracking mechanisms is how many hits we had, where they are from and what pages they have accessed. So we are able to assess what information people are more interested in. (July 2004)
The feedback from the use of tracking software affected the company’s future communication of environmental issues through its website.

The discussion here indicates that the externally recordable feature was useful for the company. This observation is compatible with the findings from the website analysis.

The need for computer processable memory was recognised by the interviewees through search based tools, as is evident from all the interview responses. Analytical tools were not mentioned by them in any interview. These findings support the use of search engines and the non-usage of analytical tools, which was observed during the various website analysis stages.

The interview responses indicated that Company B was reluctant to recognise the need for targeting specific stakeholders through web based environmental communication. Interviewee B2 explained why the company did not utilise hyperlinks to provide information for specific stakeholders:

No. We certainly would not do that and I will tell you why. In the past, this is going back a little while now, corporations have been accused of providing different information to different stakeholder groups, i.e. providing a greater level of information to state governments and regulators and a lesser amount of information to non-governmental organisation (NGO) groups and the general public. Now the argument back then was that why are companies not willing to share all of the information with all of the stakeholders. And that is our point of view. Whatever we would provide to one stakeholder, we would absolutely provide to other stakeholder groups. Therefore, anything we provide on the Internet is for all groups. We certainly would not go through this form of classification in that respect. (January 2005)

Thus, the interviews indicated that the personal source feature in relation to organisation was not needed by the company. This explains its non-usage in practice, as ascertained through the various website analysis stages.

In summary, management required certain web based presentation and organisation capabilities. These findings explain the use of the language variety, externally recordable and search capabilities of computer processable memory, the limited use of multiple cues and the non-usage of personal source throughout the various website analysis stages. The interviews indicate that organisational needs were more critical than presentation.
8.5.1.3 Accessibility

In all the interviews, the interviewees acknowledged the mass communication and global reach offered by the web. Some of the comments in support of these benefits were as follows:

_There are so many people using the web these days that it is a good way of getting information out to people. People can get a taste for the company and what the company is doing in the areas of environmental management and sustainable development [Sic]._ (Interviewee B1, February 2004)

_It is worldwide – anyone with access to the computer can access the information – in that way, it is non-discriminatory._ (Interviewee B2, February 2004)

_The web, however, allows us to provide all of these documents on the website and, therefore, increases the amount of people who have access to the web. And more often than not, we refer people to the website. For access to reports, we would use the website._ (Interviewee B2, July 2004)

_We will use the website to communicate environmental information to most audiences. If we want the information to go to a wider range of audiences, we will use the website._ (Interviewee B3, July 2004)

_We are an international company, and we have 25 operations in five countries. So anyone anywhere in the world can log onto our website and get the same information. In that respect, we have about 25,000 employees, including contractors, and about 10,000 shareholders and they all can get the same information._ (Interviewee B2, January 2005)

This explains the extensive use of the multiple addressability feature, as is evident from the website analysis.

In summary, the accessibility feature of web based environmental communication was critical for Company B. As discussed earlier, presentation features were limited to improve accessibility to the website. The web enabled the accessible communication need to be realised through its multiple addressability feature.
8.5.1.4 Interaction

In relation to the interactive capabilities of the web, Interviewee B1 remarked:

*Websites are more passive and there is more of one-way communication. However, emails are used heavily to communicate and send documents to people.*

(February 2004)

The initial interviews highlighted that emails and feedback forms were primarily utilised for electronic engagement with stakeholders. Interviewee B2 conceded that, in the past, their email usage was quite low. However, 70 per cent of all emails received through the website related to environmental issues.

The later interviews, however, indicated that the need for interaction through the web was not critical for the company. For instance, Interviewee B2 remarked:

*There are not any specific features of the web that we use to interact with stakeholders except that everything that is publicly produced is basically accessible on the web. So it is basically the transparency and accessibility that we use the website for.* (January 2005)

The above indicates that the need for web based interaction in the company declined during the period of analysis. This was matched by developments in use of the personal source and concurrency features on the website, as discovered in the second stage of the longitudinal website analysis.

Interviewee responses throughout all the interviews suggests that discussion fora, bulletin boards and chatrooms were not regarded as important for the environmental communication practice in Company B. When asked about the use of these mechanisms, Interviewee B2 posited:

*Probably not - I wouldn’t think so. We would use those tools internally with our internal stakeholders and we do that from our Intranet as opposed to the Internet, and that is quite useful for information sharing at an internal level.*

*The difficulty, of course, with doing that externally is the ability to control what other people might write or post to your Internet and the liability you have to be responsible for that information. Because of those issues, it is highly unlikely that you would be setting these up online. What we would be doing instead is ask people to have those conversations offline.* (January 2005)
Thus, as highlighted in the various website analysis stages, the personal source and concurrency features of the web were restricted to emails and feedback forms, which also declined in usage over time. Even though the web has the potential to enable extensive engagement with stakeholders, as discussed in section 3.4.5, management’s need for the interactive capabilities of the web was not that critical. Thus, one-directional reporting rather than two-way communication was the focus of Company B’s web based environmental communication practice.

8.5.1.5 Summary

<table>
<thead>
<tr>
<th>Web based environmental communication need</th>
<th>Evidence</th>
</tr>
</thead>
<tbody>
<tr>
<td>Timeliness</td>
<td>The need for this factor declined over time, explaining the lack of use of the immediacy feature.</td>
</tr>
<tr>
<td>Presentation and Organisation</td>
<td>This factor was a critical requirement for communication with focus being mainly on organisational capabilities and limited presentation features. Consequently, multiple cues were limited to graphics and pictures, externally recordable had extensive use, language variety had a moderate use, computer processable memory was limited to search tools and personal source features were barely used.</td>
</tr>
<tr>
<td>Accessibility</td>
<td>This factor was critical, and impacted the increasing use of the multiple addressability of the web.</td>
</tr>
<tr>
<td>Interaction</td>
<td>This capability was not that critical, explaining the use of only emails and feedback forms for enabling personal source and concurrency. The need for these features also declined during the period of analysis. Sophisticated tools such as discussion fora, bulletin boards and chatrooms were not critical to the company, resulting in their non-use.</td>
</tr>
</tbody>
</table>

Table 8.4 summarises the impact of management’s web based environmental communication needs on the extent of web usage in Company B. The data highlights that organisation and accessibility were critical for the company while the need for presentation was limited. The need for timeliness and interaction declined during the period of analysis. These findings explain the increasing use of the externally recordable and multiple addressability features, the moderate use of language variety and computer process memory, and the limited use of immediacy,
multiple cues, personal source and concurrency in the company’s web based environmental communication practice.

8.5.2 Contextual influences

As discussed in Chapter Four, management’s needs for communication through the web medium can be influenced by certain contextual factors. Contextual factors include technological limitations, economic factors, internal organisational factors and external stakeholder influences. The influence of contextual factors on the web based environmental communication practice in Company B, explored through the interviews, documentary evidence and website analysis, is discussed in the following subsections.

8.5.2.1 Technological Limitations

As discussed in section 4.3, technological limitations that could affect web based environmental communication include security, poor website design and inadequate promotion, doubts over information authenticity on the website and an overload of information on a website. The potential impact of these limitations on web based environmental communication in Company B was explored.

The interviewees highlighted that they had experienced problems related to security in the past. However, these problems were controlled and they did not restrict web based environmental communication.

Interview responses suggest that website design was critical for the company. The emphasis was on having an accessible and user friendly website. Interviewee B2 stated:

_We make sure that it (website) is simple, logical, succinct and things are in the right place._ (July 2004)

These comments reflect the actual web based environmental communication practice of Company B observed during the various website analysis stages. As previously discussed, multiple cues were restricted in order to make the use of the website accessible to numerous stakeholders.
The interviewees mentioned that they had received positive feedback from stakeholders about the ease with which their webpage could be navigated. It was highlighted that the local staff had extensive expertise in website design and played an instrumental role in designing the website of the parent company.

The importance of promoting the website was acknowledged by the interviewees. They stated that business cards, banners and flyers were extensively used to promote the website. It was mentioned that special presentations on environmental issues and newsletters were also used to inform stakeholders of the company’s environmental communication through its website. The interviewees also highlighted that hardcopy reports referred to the website.

The interviewees perceived the authenticity of information as a critical issue for environmental communication. It was mentioned that stakeholders such as NGOs were often sceptical of the authenticity of the company’s environmental content on the web and could regard such content as ‘greenwash’.

The interviewees revealed that the company overcame the problem of information authenticity on the website by subscribing to web based standards such as W3C as well as seeking to provide audited information on its website. For instance, the social and environmental report which was available on the website for download was audited. However, other information appearing on its website was not.

The potential for information overload through web based environmental communication was also acknowledged by the interviewees. Interviewee B2 remarked:

*With regard to the GRI and other initiatives, there is an increasing expectation for companies to release every single bit of environmental information that ever existed, and I think that whilst we in the industry and people with a particular environmental interest like to see this information, most of the general public is overloaded with information and really do not have an interest in the amount of information that is required by some of these initiatives.*

*For environmental issues, companies need to identify who their audience is and what is their level of interest rather than bombarding people with every bit of information that existed.* (February 2004)

Interviewee B3 indicated that the company’s response to information overload was to have a balance in the information communicated through the website.
In summary, the data in Table 8.5 indicate that technological limitations, such as security, and website design and promotion, were managed by Company B, as is evident from the responses throughout all the interviews. These limitations did not restrict web based environmental communication. However, the interviews indicate that information authenticity and information overload restrict management’s web based environmental communication needs in relation to timeliness and interaction. These issues partially explain the company’s conservative approach to the use of the web for environmental communication, as observed during the website analysis.

<table>
<thead>
<tr>
<th>Technological Limitation</th>
<th>Evidence</th>
</tr>
</thead>
<tbody>
<tr>
<td>Security</td>
<td>Had some problems with security but this issue was managed.</td>
</tr>
<tr>
<td>Website design and promotion</td>
<td>Website design was perceived as critical, with personnel in the local company possessing sufficient expertise in website design, having designed the global website as well. Website promotion was also recognised with business cards, banners, flyers, newsletters and references in hardcopy reports being used. Special presentations also referred to the company’s website.</td>
</tr>
<tr>
<td>Information authenticity</td>
<td>Perceived as critical for hardcopy reports (audits) and for website design (W3C standards). However, audit of other information on the website was not considered, with suggestions that this matter limited the credibility of current practices.</td>
</tr>
<tr>
<td>Information overload</td>
<td>Perceived as a critical issue which has impacted the expectations for environmental communication.</td>
</tr>
</tbody>
</table>

Table 8.5: Technological limitations that impacted Company B’s web based environmental communication practice

8.5.2.2 Economic Factors

The interviewees in the initial and second series of interviews acknowledged the cost savings associated with providing environmental material online when compared to doing mailouts. Interviewee B2 stated:

*The website obviously saves on the costs and the geographic limitations of hardcopy reports.* (July 2004)

However, the interviewees also indicated throughout all the interviews that the company continued to use hardcopy reports as its primary medium for environmental communication as it did not want to neglect those stakeholders who had restricted or no access to the Internet. As discussed earlier, the company’s approach to the preparation of social and environmental reports was to have a general corporate report and
individual site based reports. Thus, economic factors had a limited impact on management’s web based environmental communication needs.

8.5.2.3 Internal organisational factors

As discussed in section 4.3, corporate attitudes towards environmental issues, stakeholders and the communication medium, coupled with the strategic considerations in relation to the use of the web for environmental communication, are internal organisational factors that could affect web based environmental communication. The potential impact of these factors on the practice in Company B was explored.

Company B perceived environmental issues as critical, as is evident from the discussion in section 8.3. Terms such as ‘transparent’ and ‘social license to operate’ were also mentioned throughout the interviews:

*It is part and parcel of the way that we do business that we have to be environmentally responsible – it becomes a community expectation – it is not something that you decide to have a green badge on and a green badge off [Sic].* (Interviewee B1, February 2004)

*These (importance of environmental issues) contribute to our concept of social licence to operate. we are being transparent about our practices from an environmental perspective and others. We are helping to maintain our social licence to operate.* (Interviewee B2, July 2004)

The interviewees also stressed throughout the interviews the importance of environmental communication in order to gain the support of their stakeholders:

*We try to ensure that information is available to people in relation to how we are managing our environmental issues and what these environmental issues actually are. We try to communicate in a non-technical form.* (Interviewee B1, February 2004)

*Mainly it is about transparency. We are providing honest impacts of our operations and the mechanisms we have to manage our impacts.*

*The main motivation from that perspective is awareness. If stakeholders are aware of what we do and the programs we have to manage our impacts, then it contributes to our social licence to operate. If stakeholders know about what we are doing, we are unlikely to be surprised along the way.* (Interviewee B2, July 2004)
A paper presented at the MCA sustainable development conference on environmental reporting in Company B stated:

_In a climate of greater social accountability, company transparency and stakeholder, environmental and social demands, [Company B] is taking a proactive approach to the public disclosure of its broader social responsibilities._

This evidence suggests that the company considered stakeholder needs as critical and that it placed a lot of emphasis on communicating with stakeholders. This observation is also consistent with the evolution of environmental communication in the company, as discussed in section 8.3.

There was also some support for the use of the web as a medium for environmental communication in the company:

_It has a lot to do with reputation. Communication is multifaceted – heaps of stuff on the web will not improve reputation – we have to do what we say. The worst thing you can do is to let your public relations people go berserk on the website without control and give an impression that you are doing a lot on the ground when you are not. On the other hand, it is stupid to be doing lots of fantastic stuff but not telling anyone. You have to get the balance right [Sic]. (Interviewee B3, July 2004)_

_I think people do want to find out about a company these days, and the most obvious way to know about the company is to click on the web. What the person finds out about your company is only as good as what information you have got on the web. I think it is incredibly important._ (Interviewee B3, January 2005)

However, interviewee responses suggest that the company was reluctant to adapt to the evolving nature of environmental communication through the web immediately. Interviewee B3 explained the company’s position:

_Obviously, the company sees the web as a very important medium for communication. But it certainly is not the only medium. There is a need for a human face to be associated with communication. At the end of the day, everyone would like to talk to someone. For example, as part of your research, you chose to talk to people in addition to looking at company websites._ (July 2004)

The interviewees therefore conceded that communication through its social and environmental reports was the primary approach to environmental communication for the company. However, the web complemented its environmental communication
practice with its emphasis on organisation and accessibility needs. Corporate attitudes therefore enhanced organisation and accessibility web based environmental communication needs. This resulted in the use of the language variety, externally recordable, computer processable memory and multiple addressability features, as is evident from the website analysis.

It was mentioned in the initial series of interviews that the company was considering an increasing use of web based technologies over time. However, the evidence from the second and postscript stage of the longitudinal website analysis suggests that this was not the case. Therefore, other potential factors could explain the current usage of the web for environmental communication in the company.

Given the company’s conservative approach towards the adoption of the web medium, the interview responses suggested that Company B’s strategic consideration in relation to web based environmental communication was to only utilise certain features of the web. This strategic intent contributed to the use of the organisation and accessibility capabilities of the web. It also led to the declining need for timeliness and interaction, explaining the reduction in the immediacy, personal source and concurrency features, as observed during the second stage of the longitudinal website analysis. The presentation capabilities of the company were not considered by the company, so use of multiple cues features was limited.

In summary, corporate attitudes towards environmental and stakeholder issues was critical for Company B. However, these attitudes were transformed into a strategic consideration that involved utilising certain capabilities of the web while limiting others.

8.5.2.4 External stakeholder influences

It appears from the interview responses that Company B had two different sets of stakeholders—those concerned with general issues as well as those affected by environmental performance at the site level. The local community was regarded as being concerned about site level issues while NGOs, suppliers and contractors were regarded as being concerned about general environmental issues. However, the interviewees conceded that this distinction was not clear-cut because some
stakeholders—governments and employees—were concerned with both general and on-site environmental issues. An analysis of the information about stakeholders and their importance in the company’s prior social and environmental reports confirmed the interview findings.

Interviewee B1 revealed that the company identified stakeholders at both the site level and more broadly. At the site level, a formal process of stakeholder identification was carried out and local managers had to be aware of the ‘external social fabric that their operations are on’ (Interviewee B1, February 2004). ‘Broader’ stakeholders, such as NGOs, governments and regulatory bodies, were identified by the General Manager Environment, who had to maintain existing relationships with them.

The interviewees also revealed that the company previously had an external advisory group to engage with its stakeholders. This group was used to seek stakeholder views on the environmental communication process. The external advisory group had a limited role in environmental communication once the company was taken over in 2002.

The interviews at Company B highlighted that stakeholders influenced its environmental communication. Interviewee B3 stated:

*Our communication is driven by stakeholder needs. Stakeholder perceptions shape our views.* (July 2004)

Moreover, Interviewee B2 remarked:

*Yes, they (stakeholders) definitely do (influence environmental communication). For example, the WWF used to develop a scorecard of mining companies and their environmental reports in Australia and give them a score for the quality of their information. So we would get that and have a look at where we scored well and where we have not scored well. This will certainly influence us next year to include greater information in these reports.* (July 2004)

Stakeholder demand also contributed to web based environmental communication, as clearly summarised by Interviewee B2:

*I think there is much more information communicated nowadays because it is easier, cheaper and more dynamic to put information on the web than to print a hardcopy.*
And I think it is also because of the Internet that people’s demand for information is greater. Now they expect more information. Previously, they were happy with a single paragraph in an annual report but with the web, there are no limitations of space. (July 2004)

The interviewees also acknowledged the MCA support for web based environmental communication.

The interviews highlighted that Company B had acknowledged the demand from stakeholders for web based environmental communication. The company, however, focused only on the organisation and accessibility aspects of web based environmental communication. The second stage of the longitudinal website analysis indicated that even though the local website was restructured, language variety, externally recordable, computer processable memory (search tools) and multiple addressability were still utilised.

The interviewees mentioned that one of the primary reasons for Company B’s reluctance to undertake web based environmental communication extensively was that many of their stakeholders did not have access to such technologies and were not competent in utilising them. Interviewee B2 stated:

We have even gone as far as deciding whether we should produce these (social and environmental reports) in hardcopy. But there are some of our stakeholders in remote locations that do not have access to the web and some who do not like using the web but like a hardcopy in their hand. So we are unlikely to stop producing hardcopies. (February 2004)

Stakeholder preference for print media was raised in the second series of interviews. Some of the issues raised in favour of print media were:

The print medium allows people to take something home, something tangible, and quite often, I guess, people get lazy about the Internet. If they have a book that they can physically flick through, they would, but if you ask them to log onto the web, they may not do this. (Interviewee B2, July 2004)

When you are on a bus or train – anything in print medium can be read remotely. At the end of the day, people would like to have something that they can read.

Also, you can write on it (print media). (Interviewee B3, July 2004)

The interview responses therefore suggest that stakeholder preference and competence in relation to web based technologies was instrumental in influencing the extent to
which the web was utilised for environmental communication. This factor affected the presentation and organisation web based environmental communication need. It explains the restricted need for presentation, resulting in the limited use of the multiple cues features, as observed during the website analysis. Moreover, it also provides an understanding of organisational need. The various website analysis stages indicated that tools such as web portals were not adopted by the company.

In summary, the interviews highlighted that Company B acknowledged the demand from stakeholders for web based environmental communication but also considered the competence and preference for the use of the web by certain stakeholders. Thus, stakeholder demand enhanced management’s web based environmental communication needs in relation to organisation and accessibility, but concerns over stakeholder preference and competence restricted presentation and organisation.

8.5.2.5 Summary

<table>
<thead>
<tr>
<th>Contextual influence</th>
<th>Evidence</th>
</tr>
</thead>
<tbody>
<tr>
<td>Technological limitations</td>
<td>Security and website design and promotion were effectively managed by the company. However, information overload and authenticity restricted current practices.</td>
</tr>
<tr>
<td>Economic factors</td>
<td>The web was perceived as a cost beneficial medium for environmental communication. However, hardcopy reports were extensively produced.</td>
</tr>
<tr>
<td>Internal organisational factors</td>
<td>Positive attitudes towards environmental issues and stakeholders but these were not matched with recognition of the evolving nature of communication. The strategic use of the web for environmental communication was therefore limited to certain capabilities whilst other potential tools were not utilised.</td>
</tr>
<tr>
<td>External Stakeholder influences</td>
<td>The company was concerned about the preference and competence of its stakeholders, leading to restrictions in web based environmental communication. However, stakeholder demand for web based environmental communication was acknowledged.</td>
</tr>
</tbody>
</table>

Table 8.6: The impact of contextual influences on web based environmental communication in Company B

Table 8.6 summarises the contextual influences on Company B’s web based environmental communication practice. Technological limitations reduced the need for timeliness and interaction. Economic factors had a minimal impact on web based
environmental communication. Internal organisational factors and external stakeholder influences enhanced management’s web based environmental communication needs in relation to accessibility and organisation. However, the former also restricted the need for presentation, timeliness and interaction (strategic approach to web based environmental communication) while the latter reduced the need for presentation and organisation (concerns over stakeholder preference and competence).

8.5.3 Emerging themes

A number of critical factors were identified from the field which explained Company B’s web based environmental communication.

8.5.3.1 The double-edged sword

*In my four and a half years in this company, I have seen the web develop in leaps and bounds. It has had almost an exponential growth.*

*The web is extremely positive in certain ways but it is also a double-edged sword – if you do a wrong thing, the minute you do this, the four corners of the world knows about this. It can come back and haunt you.* (Interviewee B1, February 2004)

This statement highlights the ‘double-edged sword’ factor. A number of issues raised suggested that the communication potential of the web could not be realised in all situations.

The interviewees highlighted that presentation needs could be detrimental when they impede the access speed of the website for those stakeholders who have limited technological facilities. Thus, web based presentation tools could limit access to the website and have a ‘double-edged’ effect. This limitation was acknowledged by the company because it recognised that some stakeholders had restricted access to web based technologies. Multiple cues were therefore restricted in order to improve access to the website, as is evident from the website analysis findings.

The interviewees mentioned that the benefit of having increased information organised on the web was restricted by confidentiality concerns. The information could also be taken out of context and used against the company. This matter was clearly summarised
by Interviewee B3, who suggested that companies need to strike a balance when undertaking web based environmental communication:

*I think it is really a huge issue because companies these days are talking about being more open and transparent, but it is balancing act. Quite honestly, it is a balancing act between being more open and transparent but not putting stuff out there which is giving people the ammunition to get their guts over. It is too easy for people to take information off a website, take it out of context and use it against you. That is what the lawyers worry about. It really does happen. It happens to us. So you become a bit gut shy after a while.*

*I really think this whole area is a balancing act. On the one hand, we would like to be more open and put more stuff out there, but on the other hand we have to be careful from a legal perspective because we don’t want to give organisations that are out there to attack us information on a platter that they can take out of context. That in a nutshell is the issue [Sic]. (January 2005)*

The problematic nature of accessibility was also recognised at Company B. Interviewee B2 stated:

*We find here in Australia that the things that impede the use of the web are the lack of people online, the lack of people that actually have web facilities and the access times - trying to access things from across the world or across the country can be slow. And certainly, with some of our stakeholders in remote areas or in indigenous communities they just do not have access to the web. (January 2005)*

A comparison of these interview responses with actual web usage in Company B during the period of analysis indicates that the double-edged sword restricted presentation needs and that organisation and accessibility needs were managed by the company. As the company did not have an increasing need for timeliness and interaction through the web medium, the interviewees did not mention the double-edged nature of these needs. Another factor from the field that provides further insights into Company B’s web based environmental communication practice is discussed in the following section.

8.5.3.2 Change in management philosophy

A change in management philosophy was a critical factor that emerged throughout the different phases of the interviews. A chronological overview of this matter is provided.
In its 2001 social and environmental report, the managing director of Company B stated:

> Since the publication of the (social and environmental) performance reports last year, a significant change occurred in the ownership and structure of the Company. The Company’s commitment to providing transparent data on its performance … has not changed.

The discussion in this section indicates that even though the local company’s commitment may not have changed, it was restricted in its environmental communication practice.

An overview of the company’s social and environmental reports from 2001 to 2003 highlights that while in 2001 there was a detailed report for the local company, its representation after its takeover in February 2002 was limited to site based reports for local operations. The interviewees mentioned that there were restrictions on Company B’s environmental communication, even though the parent company adopted the local company’s social and environmental management and communication procedures. The five-star integrated management system, and the social and environmental communication process that focused on an overall corporate report as well as site based reports for all operations of the company, were adopted by the parent company. Whilst these developments indicate that the local company had a positive influence on the parent company’s environmental management and communication, interviewees for the initial series of interviews were of the opinion that Company B’s own environmental communication practice was adversely affected as a consequence. Interviewee B2 stated:

> The general challenge we have for environmental communication is that Australian reporting requirements are different from US reporting requirements. We are an Australian branch of the (parent company) mining corporation, which is based in the US. (February 2004)

The parent company’s approach towards social and environmental issues is clearly summarised by the following quote from its managing director in the 2002 corporate social and environmental report:

> However, as our industry focuses more attention on sustainability and social responsibility, it is important to understand that we can only do so much.
Corporations are not a substitute for government but rather work in partnership with government.

In the second series of interviews, the interviewees acknowledged that the effect of the change in management philosophy was critical for web based environmental communication. This was largely due to the fact that websites are global and, therefore, the entire company was liable for whatever appeared on any of the subsidiaries’ websites. Interviewee B2 stated that, with hardcopy reports, the audience could be limited to local stakeholders. However, this process could not be applied to its ‘universal’ website. All potential global stakeholders had access to the website. The interviewees stressed that this issue was further complicated by web based environmental communication processes being not just periodic but also ad hoc.

The interviewees revealed that any environmental information to be placed on the website had to go through headquarters and that a formal sign-off was required. There was also a need to have information on the local website consistent with information on the parent company website. Interviewee B3 remarked:

There is a strong push from (headquarters) to stop regional offices from having their own websites and to have their own communication. Part of why this has happened is that, with the takeover, we are a parent company and have a single set of values and culture. (July 2004)

The interviewees believed that this restriction limited the ‘creativity and independence’ of the local branch staff and reduced their control over their website. Interviewee B2 remarked:

Our environmental communication has specifically changed a bit in the last 12 months as the responsibility has gone to (headquarters).

And I think the willingness to disclose information is greater in Australia than in the US. They have more legal considerations that they have to make when they publish information so it makes it more difficult to do so. They require more general overview type of information from us whereas, in the past, the information we have put out is far more detailed. Unfortunately, it will go through a vetting process and, with tougher legislative requirements, a lot of detail will be reduced. So, basically, because people have access to so much information on the web, their expectation for the information is heightened. (July 2004)
It was not clear what impact this limitation in communication ability had on the local company’s stakeholders. As discussed in section 8.5.2.4, the need for the external advisory group was limited after the takeover, as decisions relating to Company B’s environmental communication process were primarily made by the parent company.

The second stage of the longitudinal website analysis confirmed the extensive reduction in the environmental information communicated on the local company’s website. The third series of interviews highlighted that this restriction affected the local personnel, who were unable to utilise the benefits of the web for environmental communication. Interviewee B2 remarked:

*Obviously, the website is the most convenient and easily accessed force so we hope in the future to be able to get back to using it as the timely communication force. (January 2005)*

Interviewee B3 stated:

*If we restrict what content we put on it from a (local company) perspective, then I think we are losing some reputational value, in my view.*

*In the US, I think the legal people worry about too much disclosure and I think that impacts on what we can and cannot do, being a US company. When we were an Australian company, we rightly or wrongly had less concerns about it, even though we always had our legal counsel review whatever we put on the website. We seemed to have the ability to convey more information via the website when we were purely an Australian company.*

*I think it has definitely had an impact and hopefully over time we can work through that issue with the headquarters, allowing more information to be put up.* (January 2005)

Interviewee B2 indicated that Company B undertook other approaches to counter the restrictions in its web based environmental communication practice. These approaches included using media releases and making extensive presentations about social and environmental matters. The second stage of the longitudinal website analysis indicated that these presentations were later archived on its website, which also stored social and environmental reports. However, as indicated by the postscript stage, given that Company B now has a small representation on the global website as opposed to having its own website, its ability to communicate environmental issues to stakeholders effectively was reduced.
In summary, the change in management philosophy initially reduced the need for
timeliness and interaction through the web medium. This explained the company’s
conservative approach towards web based environmental communication. It appeared
from the initial interviews that Company B was conscious of the potential benefits of
the web and was considering an increase in using it for environmental communication.
The company balanced this need with the restrictions arising from the change in
management, as highlighted by the findings of the general website analysis and first
stage of the longitudinal website analysis. However, the second stage of the longitudinal
website analysis indicated a restructure of the company’s website in March 2004. The
second and third series of interviews highlighted that a change in management
philosophy led to the limited use of the web for environmental communication. The
implication was that communication needs such as timeliness and interaction had
limited usage. This factor later superseded all of the local management’s web based
environmental communication needs, as is evident from the postscript website analysis
stage, and led to the restricted use of the web for communicating environmental issues.

8.6 Summary

Company B used the web to complement its environmental communication through
hardcopy reports as well as to provide general environmental information. It utilised the
multiple addressability and externally recordable features extensively in conjunction
with the moderate use of language variety and computer processable memory. These
features, however, had limited usage after data collection for this research was
completed in 2004. Multiple cues were not used extensively in any stage of the
company’s web based environmental communication practice. Immediacy, personal
source and concurrency features declined in usage from the general and longitudinal
website analysis initial stage to the second stage. This resulted in their limited usage in
the postscript stage.

Company B’s web based environmental communication needs were initially focused on
organisation and accessibility. Support for these needs was provided through positive
 corporate attitudes and stakeholder demand. External stakeholder influences in relation
to preference and competence reduced the need for presentation and organisation.
Strategic considerations and the double-edged sword factor also reduced the need for
presentation. Technological limitations (information authenticity and overload),
strategic considerations for the use of the web and a change in management philosophy restricted the need for timeliness and interaction.

The change in management philosophy factor was a critical issue that explains the rapid decline in the use of the communication potential of the web by Company B. This resulted in the limited use of the web for environmental communication in the postscript stage. Figures 8.5 and 8.6 provide a summary of the key factors affecting the company’s web based environmental communication practice.
Figure 8.5: Factors impacting Company B’s web based environmental communication practice during the data collection period
Figure 8.6: Major factor impacting Company B’s web based environmental communication practice after the data collection period
Chapter Nine: Web based environmental communication in Company C

9.1 Introduction

This chapter presents the findings in relation to Company C. Section 9.2 discusses the specific data sources for this case. The next section focuses on the contextual background for the case by providing an overview of the company’s environmental issues and environmental communication practices. Section 9.4 addresses the first research theme—the extent of web usage—through an analysis of the data collected from the initial interview, documents and longitudinal website monitoring. Media Richness Framework features are used to assess the extent of web usage. Section 9.5 addresses the other research themes—management’s web based environmental communication needs, contextual factors and emerging themes—in order to establish the factors influencing the extent of web usage. Interviews and documents, which were supported by the website monitoring findings, were used in this analysis. In section 9.6, the findings for this case are interpreted in terms of the research model.

9.2 Data Sources

As highlighted in section 5.5, longitudinal website monitoring, interviews and documents were used to collect data for the company specific phase of the research. These data were analysed in relation to the research objectives for this study—the extent of web usage and factors influencing this usage. The specific research themes from section 4.4 guided this analysis.

The longitudinal website analysis was organised in several stages. The initial structure of the website on 31 December 2003 provided the basis for ascertaining the changes made to the website over the year. Unlike the other two companies, Company C did not restructure its website during 2004. Thus, the timelines for the longitudinal website analysis for the company were 31 December 2003 and 1 January–31 December 2004.

The general website analysis findings in relation to Company C, as discussed in Chapter Six, were used in conjunction with the longitudinal website analysis results to assess the
extent of web usage. However, a postscript stage (1 January 2005–September 2007) was used to identify any significant issues related to web based environmental communication arising after the longitudinal website monitoring ceased at the end of 2004. This enabled a complete account of the company’s practice to be ascertained.

<table>
<thead>
<tr>
<th>Interviewee</th>
<th>Position</th>
<th>Job responsibilities in relation to environmental communication</th>
</tr>
</thead>
<tbody>
<tr>
<td>C1</td>
<td>Vice-President Sustainable</td>
<td>Had the overall responsibility for environmental communication in web based and hardcopy form.</td>
</tr>
<tr>
<td></td>
<td>Development</td>
<td></td>
</tr>
<tr>
<td>C2</td>
<td>Web Content Manager</td>
<td>Placed environmental information on the website and managed the corporate website.</td>
</tr>
</tbody>
</table>

Table 9.1: Company C Interviewee Profiles

Table 9.1 provides details of the profiles of the interviewees for this study. The sustainable development and website design departments had the primary responsibility for web based environmental communication in Company C46. An initial interview was held with the Vice-President Sustainable Development (Interviewee C1). He played a critical role in the company’s web based environmental communication and indicated that the Web Content Manager (Interviewee C2) was also extensively involved in this process. The emphasis in this research was on seeking the views of those personnel who had a critical role in web based environmental communication. Thus, additional interviews were also held with these interviewees. A total of five interviews were held at Company C from March 2004–January 2005—three with Interviewee C1 and two with Interviewee C2.

The initial interview data provided an overview of web based environmental communication in Company C. Moreover, the analysis of data from all three interview phases was focused on the factors influencing the use of the web for environmental communication. This was guided by the extent of web usage identified through the general and longitudinal website analysis. If any factors explained the events of the postscript stage, these were also discussed.

Figure 9.1 lists the documents that were accessed in relation to Company C. All the documents were publicly available on the company’s website. These documents

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46 Further details are provided in section 9.4.1.
provided a contextual background for the case in section 9.3. This enabled useful insights to be gained regarding the critical environmental and stakeholder issues for the company. The documents were also used in some instances to corroborate evidence from the other data collection sources—namely, the website monitoring and interviews.

- Annual Report, 2001-2004
- Summary Social and Environmental Report, 2003, 2004
- Environmental Policy (2004).

Figure 9.1: Documents accessed in Company C

Company C’s annual reports and social and environmental reports were available from 2001. These reports were available in summary and detailed form (as a web portal) from 2003. The reports were analysed, as discussed in section 5.6.2. The environmental policy and social and environmental management standards of the company were also analysed.

9.3 Contextual Background

Company C’s social and environmental reports described its key environmental impacts as greenhouse gas and other gaseous emissions, reductions in water quality, impacts on land associated with land disturbance, alterations to biodiversity and any other potential indirect effects as a consequence of its major environmental impacts. These impacts include the environmental matters associated with the processing of minerals. Waste rocks and tailings, climate change and mine site rehabilitation are also key environmental issues for the company (Social and Environmental Report, 2004).

The documentary evidence highlighted that Company C was involved in a major environmental incident that led to public outrage\(^{47}\). Its social and environmental reports revealed that the company responded to the negative publicity arising from this incident in subsequent years by increasing its emphasis on environmental management. The company publicly stated on its website that it would not be involved in riverine or deep

\(^{47}\) Specific details of this incident are not discussed in order to protect the identity of Company C.
sea tailings disposals\textsuperscript{48} in any of its mining operations. Social and environmental reports also highlighted that there was a business case for being socially and environmentally responsible.

The company established social and environmental management standards in 2001, and these provided a basis for evaluating its social and environmental performance. Specific targets were established for reducing environmental impacts as well as managing other social issues. Mining operations were certified against the ISO 14001 standard and risk management was a critical component of the company’s environmental management process.

The social and environmental reports indicated that an environmental consequence severity system was used to classify the seriousness of environmental incidents (in ascending order) using a scale of one to five. The intention was to reduce these incidents. Governance of social and environmental issues rested within the entire organisation, with responsibilities ranging from the entire board and specific social and environmental functions to line managers and employees (Social and Environmental Report, 2004).

Social and environmental reports highlighted that, in addition to being subjected to the mandatory National Pollutant Inventory, Company C was involved in a number of voluntary initiatives. The company was a signatory to the Minerals Council of Australia (MCA) code for environmental management and its successor, Enduring Value. It was also a participant in the Greenhouse Challenge program and the mining certification evaluation program. Internationally, the company was a founding member of the Global Mining Initiative. Company C was committed to upholding the principles of the UN Global Compact and was included in a number of social responsibility indexes.

The company produced environmental reports from 1997. These were extended to incorporate social and environmental issues in 2000 (Social and Environmental Report, 2001). In 2001, a group report was prepared to represent the merger, but combined data were not included; the report merely had information for each of the two merged companies. Combined reports were prepared from 2002 onwards. The Australian

\textsuperscript{48} These involve the disposal of liquid waste (tailings) into nearby rivers or the sea.
company approach to environmental reporting was primarily adopted for its report format and content.

The company’s primary means of environmental communication from 2003 involved providing a summary of its social and environmental report in hardcopy form in conjunction with the detailed report presented as a web portal on its website. Company C also provided a compact disc containing the full report on the web portal (Social and Environmental Report, 2003). The company was identified as one of the leading Australian mining companies in the ‘Ore or Overburden survey’ (WWF, 2000) and in the Peck and Sinding (2003) and Jenkins and Yakovleva (2006) social and environmental reporting studies, which were discussed in section 5.3.

9.4 The Extent of Web Usage

Company C’s extent of web usage for environmental communication was explored through the initial interview, documents and website analysis. The interview and documentary evidence were used to establish the role of the corporate website in environmental communication and to identify the personnel and processes involved in web based environmental communication. The longitudinal website analysis was used to ascertain the extent of web usage for environmental communication over time.

9.4.1 An overview of web based environmental communication

The Vice-President Sustainable Development (Interviewee C1) asserted that the company’s approach from 2003 onwards was to provide detailed environmental information on its website in order to complement summary social and environmental reports in hardcopy form. Extensive environmental information was stored on a web portal for those stakeholders who required further details. An analysis of the relevant documents, as discussed in the preceding section, confirmed this assertion. The interviewee also stated that the website could be used to communicate ad hoc issues.

Interviewee C1 was involved in overseeing the web based environmental communication practice for Company C. He was assisted by the Web Content Manager (Interviewee C2). Interviewee C1 indicated that there was also a project team involved in periodic web based communication. This included, in addition to the environmental
and website design (including information technology support) personnel, communications staff, outside contractors who were in charge of designing the web portal and representatives of the various business units. The interviewee revealed that the legal team and board of directors had responsibilities for vetting the periodic information communicated on the website.

The preparation of the web-based portal for the company’s annual social and environmental report involved the project team. The Vice President Sustainable Development (Interviewee C1) was in charge of preparing this report, and the team agreed upon the way in which the information should be communicated on the web portal:

*I coordinate the process and we have people who assist us in converting a written report to a web-based interactive report.*

*The way we do it is that we have a steering committee that has representatives from all of the businesses. This team contributes to what will work well and what won’t, what sort of information is best represented in a particular way. We basically decide what the material disclosures are, ensuring that these are accurate.* (Interviewee C1, March 2004)

Following this process, the legal team and board of directors had to sign off on these reports before they were released. The initial interview also revealed that for ad hoc communication, requests for environmental information to be uploaded on the website went through Interviewee C1, who initiated changes on the website by instructing the website design department (managed by Interviewee C2) to place environmental information on the corporate website.
Figure 9.2 summarises the web based environmental communication practice in Company C, as established from the initial interview. The figure highlights the critical role of the sustainable development section and website design team in web based environmental communication and highlights that, for periodic communication, a project team was also involved. These insights support the selection of the Vice
President Sustainable Development and Web Content Manager for the interviews in this research.

9.4.2 Longitudinal website analysis

9.4.2.1 Stage one - Initial Structure – 31 December 2003

Company C had a specific section called health, safety, environment and community (HSEC) on its website, the details of which are provided in Figure 9.3. Environmental information was extensively communicated on its webpage.

- Highlights
- HSEC governance
- Policies and key documents
- Reports
- Health
- Safety
- Environment
- Community
- HSEC news
- Corporate Social Responsibility
- Contact details

Figure 9.3: Company C’s website structure for environmental information content as at 31 December 2003

As discussed earlier, Company C presented its social and environmental report as a web portal and only had the summary report in hardcopy form. Reports for the various mine sites were available for download on its reports section. Archived reports were also provided in this section.

In addition to providing social and environmental reports, environmental policies, performance initiatives and governance information were communicated. Similarly, the company provided details of the major environmental incident that it was involved in, even though several years had elapsed since it had occurred.
The company provided a separate section for HSEC news items. It also had a section for contact details, where a general HSEC email address was provided. Other means of electronic interaction with stakeholders included electronic feedback for its periodic social and environmental reports.

9.4.2.2 Stage two - Changes to the website in 2004

Table 9.2 provides specific details of the changes that took place on the environmental section of Company C’s website in 2004. No major changes occurred on the website in the first half of the year. In February, an update on the HSEC news indicated that the company had won a community award.

<table>
<thead>
<tr>
<th>Date</th>
<th>Information Content</th>
<th>Issue</th>
</tr>
</thead>
<tbody>
<tr>
<td>5 February</td>
<td>The HSEC news component of the sustainable development section provided details on the community business partnership award won by the company.</td>
<td>Social (Community)</td>
</tr>
<tr>
<td>16 September</td>
<td>The company’s 2004 social and environmental report was available on the website. At the same time, certain sections of the website were updated.</td>
<td>General social and environmental</td>
</tr>
<tr>
<td>13 October</td>
<td>HSEC briefing was webcasted from London. A PowerPoint presentation was also available, which was later archived with a transcript of the presentation.</td>
<td>General social and environmental.</td>
</tr>
</tbody>
</table>

Table 9.2: Changes on Company C’s website in relation to environmental issues in 2004

In the second half of the year, there were two major changes on the website. In September, the company released its social and environmental report on its website. Only the summary report was in hardcopy form; the detailed report was presented and organised as a web portal. Stakeholders could also email the company and request the detailed report to be sent to them. This facility enabled the company to potentially interact with its stakeholders, albeit electronically.

The other major change on the company’s website in the second half of 2003 was the HSEC briefing, which was webcasted from London. The presentation and its transcript were later archived on the website.
## 9.4.3 Overall Web Usage

Having explored the web based environmental communication practice, the extent of web usage could be ascertained. Media Richness Framework features were applied to the findings about Company C’s practice, as observed during the general website analysis (Chapter Six) and the two stages of the longitudinal website analysis. Table 9.3 summarises the extent of web usage in relation to the Media Richness Framework features. These are discussed subsequently.

<table>
<thead>
<tr>
<th>Media Richness Framework feature</th>
<th>Evidence</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Immediacy</strong></td>
<td>Realised through the release of periodic social and environmental reports and ad hoc communication of social and environmental issues.</td>
</tr>
<tr>
<td><strong>Multiple Cues</strong></td>
<td>Presentation flexibility included pictures and graphics. An annual webcast demonstrated the use of multimedia.</td>
</tr>
<tr>
<td><strong>Language Variety</strong></td>
<td>Hyperlinks and menus were used to organise environmental information. A separate web portal hosted the ‘detailed’ social and environmental reports.</td>
</tr>
<tr>
<td><strong>Personal Source</strong></td>
<td>Email alerts existed for corporate issues. Hyperlinks were not used to provide specific information for each stakeholder. Emails were primarily used to enable a personal source for stakeholders and these were extensively utilised when periodic reports were released.</td>
</tr>
<tr>
<td><strong>Multiple Addressability</strong></td>
<td>The mass communication and global reach of the web was utilised by the company, especially in relation to periodic release of social and environmental reports.</td>
</tr>
<tr>
<td><strong>Externally Recordable</strong></td>
<td>Current and prior reports were available on the website, and these could be printed and downloaded.</td>
</tr>
<tr>
<td><strong>Computer Processable Memory</strong></td>
<td>A search engine was available on its website. The web portal for social and environmental reports also had a specific search engine to assist in the navigation of information. Analytical tools were not utilised.</td>
</tr>
<tr>
<td><strong>Concurrency</strong></td>
<td>Emails and feedback forms facilitated interaction with stakeholders.</td>
</tr>
</tbody>
</table>

Table 9.3: The extent to which the web was utilised for environmental communication by Company C in relation to the Media Richness Framework features, as at 31 December 2004

In the general website analysis, and the first stage of the longitudinal website analysis (31 December 2003), it appeared that Company C’s web based environmental communication practice was primarily based on the release of its annual social and environmental reports. The second stage (1 January 2004–31 December 2004) confirmed this finding. This highlights that timely information was mainly provided
during the release of its social and environmental reports. An annual webcast of its social and environmental briefing also took place around this time. This enabled stakeholders to receive environmental information immediately. It was also observed that ad hoc changes took place during the year, such as the notification of the environmental award won by the company in the early part of 2004. Thus, the company made moderate use of the immediacy feature.

The website analysis stages (general website analysis and the two stages of the longitudinal website analysis) indicated that pictures and graphics were increasingly used for web based environmental communication. The second stage of the longitudinal website analysis indicated that audio and video tools were utilised in the annual webcast of social and environmental briefings. Thus, multiple cues were extensively utilised.

The website analysis stages indicated that the company utilised hyperlinks and menus to organise environmental information on its website. A web portal hosted the periodic social and environmental reports. The portal also made use of menus and hyperlinks to assist in browsing the report and to integrate the various components of the report. These findings suggest that language variety was extensively utilised.

As observed in the various website analysis stages, an email alert for corporate issues was available. Hyperlinks and menus were not used to provide information for specific stakeholders. Only the HSEC email address provided a personal source for the company’s stakeholders. Thus, personal source had moderate usage.

The company utilised the mass communication and global reach potential of the web, as observed during the website analysis. For instance, the second stage of the longitudinal website analysis indicated that the company undertook a webcast of its social and environmental briefing to take advantage of the web’s accessibility benefits in addition to its immediacy and multiple cues capabilities. Thus, multiple addressability was extensively utilised.

It was observed during the various website analysis stages that the most recent social and environmental reports for the company were organised as a web portal as well as provided in portable document format. Earlier reports also used similar formats, and
they enabled them to be downloaded and printed easily. Thus, the externally recordable feature was extensively utilised.

A search engine existed for the entire website. Similarly, the social and environmental web portal had a search engine. Analytical tools, such as electronic tools that could enable stakeholders to analyse the existing environmental information on the basis of their different information needs, were not evident on the company’s website. These findings were consistently observed during the various website analysis stages and indicate that computer processable memory had moderate use.

The website analysis stages highlights that electronic interaction was facilitated through emails and feedback forms for periodic social and environmental reports. The use of sophisticated mechanisms such as bulletin boards, chatrooms and discussion fora were not observed during the website analysis. These findings support the moderate use of the concurrency feature.


Certain issues were communicated on the company’s website beyond the detailed period of analysis which reinforced this study’s findings. The website had the same structure as that observed through the website monitoring in 2004. A web portal continued to be used to provide detailed periodic social and environmental reports. Company C also undertook a webcast of its health, safety and environment briefing in subsequent years.

9.5 Factors Influencing Web Based Environmental Communication

Having established the extent of web use for environmental communication, the factors that could explain this usage were investigated. The research model and themes guided this process. However, in line with the case study approach, findings from the field had the potential to extend the model. Management’s web based environmental communication needs are considered before contextual influences are discussed. Certain emerging themes were identified, and they are also discussed.
9.5.1 Management’s web based environmental communication needs

Management’s web based environmental communication needs were identified through the interviews with interviewees C1 and C2. The impact of these needs on the extent of the use of the web, established through the website analysis (general and longitudinal), was then ascertained.

9.5.1.1 Timeliness

The interviewees identified that a critical benefit of web based environmental communication was that timely information could be provided. Interviewee C1 offered the following remarks:

*It (the web) is reasonably quick… and readily updateable – can be done at any time [Sic].* (March 2004)

*Generally the ability to communicate in a more timely manner…* (June, 2004)

Interviewee C2 stated:

*It (the web) obviously gives you the ability to put things on straightaway if anything happens. [Sic] (June, 2004)*

However, even though regular communication was possible through the web, the interviewees mentioned that periodic and ad hoc communication through the web was a more critical and vital part of their web based environmental communication. Interviewee C1 remarked:

*our web based environmental communication is primarily on an annual basis. We currently do not have any real-time data.*

*Certainly in relation to ongoing communication, if there are significant incidents, we will disclose these.* (June, 2004)

Interviewee C2 posited:

*We are always looking at ways of improving the web and the information that we have on it. As far as the HSEC information is concerned, it comes back to the sustainable development group – if they wanted real-time communication, we would see that happening. But I don’t think they have been looking at it. I would not be surprised, though, to see this happening in future.* (January 2005)
In summary, even though the potential for timely communication through the web was acknowledged in the interviews, the views of the interviewees at Company C also highlighted a reluctance to undertake web based communication on a regular basis. The various website analysis stages confirmed that the immediacy feature only had moderate use. These findings suggest that a need for timeliness through the web medium was not critical to the company.

**9.5.1.2 Presentation and Organisation**

In all the interviews, the interviewees regarded web based presentation capabilities as vital. They did not mention stakeholder accessibility as a critical issue for restricting the use of more sophisticated technological tools in any interview. This explains the increasing use of multiple cues by the company, as is evident from the second stage of the longitudinal website analysis, whereby multimedia accompanied pictures and graphics.

Interviewee C2 described the company’s web portal as a ‘one stop shop where people can get all the information they want’ (June, 2004). In addition to the web portal, hyperlinks, menus and different file formats were perceived by the interviewees to be critical in organising and integrating the detailed environmental information on its website. For instance, Interviewee C2 stated:

> We use hyperlinks and PDFs to organise information in a logical fashion and try to give people the opportunity to link to various areas. (June, 2004)

These findings explain the extensive use of the language variety feature, which was observed during the various website analysis stages.

The interview responses indicated that, in addition to the language variety benefits, the dynamic nature of the web was also a critical part of the company’s organisational processes. Interviewee C1, for instance, remarked:

> The web does provide an opportunity to amend information so you could have updated information. (June, 2004)
In addition to these benefits, stakeholder usage of the website enabled through tracking software was perceived by the interviewees to be a critical attribute for web based environmental communication. Interviewee C1 remarked:

*It (the web) provides a role in evaluating what stakeholders are doing – it gives you some idea of how relevant they are – it provides an opportunity to assess their significance.* (June, 2004)

Interviewee C2 revealed:

*We look at type of hit rates and where people are going. Mainly after we have released something like the HSEC report and that is just general sort of data for ourselves and for our own interests and perhaps to look at how we can structure things next year. But that would be generally how we use it, to know where people are going.* [Sic] (January 2005)

The need for all these capabilities explains the extensive use of the externally recordable feature, as is evident from the website analysis.

The need for computer processable memory was recognised in all the interviews via reference to search based tools. However, in the final interview, Interviewee C1 also indicated that analytical tools could be used for environmental communication. He remarked:

*What we are looking for at the moment is whether we can move to an even greater method of web based communication such that people who come to the website can effectively manipulate that data and look at the trends itself, compare production against emissions or something that they can use to manipulate the dataset, to view what it is in whatever form they want. So it looks like the next step for us.* [Sic] (January 2005)

Thus, even though the website analysis indicated that the computer processable memory feature was limited to search tools, it was possible that analytical tools could be utilised in future.

The interview responses indicate that general communication was the focus of Company C’s web based environmental communication. Interviewee C1 stated that the emphasis was on indexing information appropriately through hyperlinks and menus so that stakeholders could navigate the website and obtain information relevant to their particular needs. This finding supports the lack of use of the personal source feature, as observed during the various website analysis stages.
In summary, the interviews indicate that presentation and organisation was a critical web based environmental communication need for Company C. These findings explain the extensive use of the language variety, externally recordable, multiple cues and search based tools associated with the computer processable memory feature. The company was also considering an increasing use of the analytical tools associated with computer processable memory. However, the lack of need for the personal source feature contributed to its non-usage.

9.5.1.3 Accessibility

As is evident from the following comments throughout all the interviews, the web was perceived as a useful tool for enabling accessibility:

*There are access benefits. You can potentially reach more people which you may not be aware of previously – you can make information available to people who may otherwise struggle to find it.* (Interviewee C1, March 2004)

*Our entire report is on the website and we allow people to contact us via the website, which makes it easier for people to access this (environmental information) at any point in time.* (Interviewee C2, June, 2004)

*People can get information around the world easily – they do not have to wait for an office to open and get a copy of the report.* (Interviewee C2, June, 2004)

*It is about accessibility, isn’t it – you can reach an enormous number of people. With all the search engines out there, people should be able to identify issues that interest them and come to your site pretty quickly. I think that is the key advantage.* (Interviewee C1, January 2005)

Interviewee C1 also elaborated on why the company had started to utilise webcasts in its environmental communication:

*Well, it’s really just an efficiency issue. It means that people can effectively participate in meetings without being there in person. It is convenient for them and it means that we do not have to go and have another meeting in Johannesburg or Sydney. We can do the one webcast at a reasonable time that people can log on.* (January 2005)

In summary, the discussion in this section highlights that the extensive use of the multiple addressability feature of the web by Company C, as observed during the website analysis, was driven by management’s critical need for accessible web based environmental communication.
9.5.1.4 Interaction

Interview responses suggested that the interaction attribute in relation to web based technologies was recognised by the company through emails and feedback forms. This confirmed the findings of the various website analysis stages. Interviewee C1 highlighted:

*It (the web) is interactive. At the minimum, the web is used for email communication. Also by having environmental information on our website and having feedback mechanisms, we do get some stakeholder contact.* (June, 2005)

Interviewee C2 stated:

*We have our HSEC email address, where people can contact us and address issues of concern.* (January 2005)

The interviewees indicated in the third series of interviews that web based mechanisms were useful for the periodic release of social and environmental reports as they enabled electronic engagement. It was mentioned that the company often received emails and feedback from stakeholders around such major events. The company also received numerous email requests for printouts of the detailed social and environmental report provided on the web.

A need for more sophisticated mechanisms for web based interaction was not evident from the responses of interviewees. Thus, as indicated by website analysis, personal source and concurrency features were moderately utilised. This finding highlights that the company was reluctant to extensively utilise the potential offered by web based technologies for extending its reporting process to incorporate interactive communication. A need for interaction through the web was therefore not that critical for Company C.

9.5.1.5 Summary

Table 9.4 summarises the impact of management’s web based environmental communication needs on the extent of web usage. The data highlight that presentation and organisation as well as accessibility were critical for the company. Timeliness was considered by the company. However, it currently did not have a critical need for this
interaction feature. Interaction was also not considered to be as critical as the other needs. These findings explain the increasing use of the multiple cues, language variety, externally recordable and multiple addressability features and the moderate use of immediacy, computer process memory, personal source and concurrency in Company C’s web based environmental communication practice.

<table>
<thead>
<tr>
<th>Web based environmental communication need</th>
<th>Evidence</th>
</tr>
</thead>
<tbody>
<tr>
<td>Timeliness</td>
<td>This attribute was not that critical for the company, leading to moderate use of the immediacy feature.</td>
</tr>
<tr>
<td>Presentation and Organisation</td>
<td>This factor was critical to the company’s needs, with language variety and externally recordable features being prominent. Multiple cues also had an increasing use, computer processable memory had moderate use, while personal source had a restricted use.</td>
</tr>
<tr>
<td>Accessibility</td>
<td>This factor was a critical element of the company’s web based environmental communication, leading to an extensive use of the multiple addressability feature.</td>
</tr>
<tr>
<td>Interaction</td>
<td>This issue was not regarded as such a critical aspect of environmental communication, thereby explaining the moderate use of the personal source and concurrency features. Emails and feedback forms were merely used. Sophisticated tools such as discussion fora, bulletin boards and chatrooms were not utilised by the company.</td>
</tr>
</tbody>
</table>

Table 9.4: The impact of management’s web based environmental communication needs on the extent of web usage in Company C

9.5.2 Contextual influences

As discussed in the Chapter Four, management’s needs for communication through the web medium can be influenced by certain contextual factors. Contextual factors include technological limitations, economic factors, internal organisational factors and external stakeholder influences. The influence of contextual factors on the web based environmental communication practice in Company C, explored through the interviews, documentary evidence and website analysis, is discussed in the following subsections.

9.5.2.1 Technological Limitations

As discussed in section 4.3, technological limitations that could impact web based environmental communication include security, poor website design and inadequate promotion, doubts over information authenticity on the website and an overload of
information on a website. The potential impact of these limitations on web based environmental communication in Company C was explored.

Interviewee C2 indicated that Company C had invested heavily in its information and communication technology infrastructure. Emphasis was placed on preventing hacking and the spread of electronic viruses. Therefore, security was not perceived as an issue that could restrict the company’s web based environmental communication.

The interviewees were conscious of the importance of website design. Interviewee C2 remarked:

We try to make the (environmental) information easy, clear and as accessible as possible. (June, 2004)

Interviewee C1 stated:

We try to make sure that what we put on the web is accessible to pretty low grade computer specifications and web browsers. We don’t put stuff up that is not suitable for general home basic computer usage. We put quite a lot of effort into usability issues such as style guides for printouts. (January 2005)

As discussed in section 9.4.1, a project team was involved in web based environmental communication. The website design team focused on aspects of design that would allow stakeholders to easily navigate the website and access critical information. Feedback was also sought from stakeholders about the design of its website. The critical importance placed on website design was reflected in the actual web based environmental communication practice, as observed in the various website analysis stages.

The interviewees revealed that Company C used media releases and emails to inform stakeholders of major changes on its website, such as the release of social and environmental reports. The summary social and environmental report had a reference to the detailed report on the website. The interviews also indicated that the company provided a compact disc with its business cards which provided links to the social and environmental report on the website. Therefore, other media for communication was often utilised to promote web based environmental communication.
The interviewees perceived information authenticity to be a critical issue. The company subscribed to W3C standards and had its periodic, detailed social and environmental report audited. However, other social and information on its website was not audited.

The interviewees also recognised information overload as an issue. They countered this limitation by producing summary reports in hardcopy form and providing detailed information on the corporate website, as observed during the website analysis. It was clearly indicated in summary reports that the detailed information on the website was only for those with specific interests and that general information was provided in such reports.

In summary, the responses from all the interviews indicated that technological limitations were managed effectively by Company C. The data in Table 9.5 highlight that these limitations did not restrict management’s web based environmental communication needs.

<table>
<thead>
<tr>
<th>Technological Limitation</th>
<th>Evidence</th>
</tr>
</thead>
<tbody>
<tr>
<td>Security</td>
<td>Not a major problem for the company.</td>
</tr>
<tr>
<td><strong>Website design and promotion</strong></td>
<td>Website design was critical. A project team was involved in designing the web portal for social and environmental reports. The website design team maintained its website. Website promotion was also important, with emails, media releases, references in social and environmental hardcopy reports and compact disc version of reports being utilised.</td>
</tr>
<tr>
<td><strong>Information authenticity</strong></td>
<td>Recognised through audit of periodic social and environmental reports, and by adherence to W3C standards. The need for an audit of other information on the website was not considered.</td>
</tr>
<tr>
<td><strong>Information overload</strong></td>
<td>A critical issue managed through having summary and detailed versions of the annual social and environmental reports available to stakeholders.</td>
</tr>
</tbody>
</table>

Table 9.5: Technological limitations that impacted Company C’s web based environmental communication practice

9.5.2.2 Economic factors

It was mentioned in all the interviews that the web was a cost effective medium for environmental communication. This finding is clearly summarised in the following quote:
Another advantage of the web is that it is relatively cost effective and allows you to reach stakeholders that you may not have known. You can also have a report mailed to addresses you know of, while the web can in one contact you and readily get that information for you without having to do a lot of work. [Sic] (Interviewee C1, June, 2004)

In the final series of interviews, the interviewees were asked to relate how the cost effective nature of web based communication applied to their own practice (observed through the website analysis). They highlighted that the preparation of a summary report enabled the company to save printing and publication costs. The amounts spent on making available the hardcopy detailed report to certain stakeholders was meagre when compared with publishing detailed glossy reports:

Well, there are cost savings, of course. It is easier and less costly if we have a big environmental report, like the one we do to put it on the website, than print thousands of copies. (Interviewee C2, January 2005)

However, the interviewees also indicated that sophisticated mechanisms for electronic interaction were restricted by economic issues. Interviewee C1 summed up this issue in the final interview:

…a resource issue managing it and, as a result, we have not tried it (use of bulletin board, discussion fora or chatrooms). So I can see that it may be useful in some instances but it is quite a labour intensive way to go – you have to monitor chatrooms, etc. We have not felt it necessary or appropriate to go down that path. (Januray 2005)

In summary, economic factors enhanced management’s web based environmental communication needs in relation to presentation and organisation as well as accessibility. These findings partially explain the company’s current approach to web based environmental communication, as observed during the various website analysis stages. However, Company C was not prepared to invest in more advanced interactive mechanisms for engaging with stakeholders, such as discussion fora, bulletin boards and chatrooms, as these were not perceived to be cost beneficial. Thus, economic factors restricted interaction. This explains the non-usage of the associated web based mechanisms, as is evident from the various website analysis stages.
9.5.2.3 Internal organisational factors

As discussed in section 4.3, corporate attitudes towards environmental issues, stakeholders and the communication medium, coupled with the strategic considerations in relation to the use of the web for environmental communication, are internal organisational factors that could impact web based environmental communication. The potential impact of these factors on the practice in Company C was explored.

It was mentioned in the interviews that the company had been increasingly conscious of its need to manage environmental issues and gain the support of its stakeholders, especially since the major environmental incident. In relation to the environmental incident, Interviewee C1 stated:

“This is still very much of a live issue – people still raise it and want to talk about it with us … In fact, it is still very much of an issue and will probably be for the next 10 years. People will continue to want to know what had happened in ...(place of environmental incident). (January 2005)

A senior position for environmental issues—Vice-President Sustainable Development, Interviewee C1—existed within Company C. There was emphasis given to social and environmental governance in the organisation. As discussed in section 9.3, there was an extensive focus on the management of environmental issues in the company.

The interviews also highlighted the importance of addressing stakeholder needs for the company. Interviewee C1 offered the following remarks:

“...I guess at the end of the day what we are trying to do is to be open and honest in our communication and, therefore, build trust with a range of stakeholders … (March 2004)

We obviously try to be responsive to stakeholder needs – that is the rationale for producing public reports. So it makes sense in engaging with them so that we know what we are doing is as efficient as possible. (June, 2004)

Moreover, the social and environmental report of 2004 stated:

“We are committed to maintaining and promoting dialogue with stakeholders in the resource industry and remaining responsive to the global community’s concerns and aspirations. The Company recognises the importance of
accountability to stakeholders, and we seek to be transparent in relation to our communications and documentation.

Thus, the interviews highlighted that the company took environmental and stakeholder issues seriously and placed an increasing emphasis on its environmental communication. These findings are consistent with the evolution of environmental communication in Company C, as discussed in section 9.3.

The views of the interviewees also suggested that the company regarded the web as a critical medium for disseminating environmental issues:

... (web based environmental communication) shows that we are open and transparent about our environmental matters. (Interviewee C2, June, 2004)

And there is also that perception that if it (environmental information) is all on the website, then we are being open about it – it is a public document and people can easily get to it if they are connected to the web, and even if they are not, it is still available easily because it is on the website. (Interviewee C1, January 2005)

Interviewee C1 indicated that the company could have utilised the web effectively at the time when it was implicated in the major environmental incident. The web was not extensively used for corporate issues at this time. However, the interviewee stressed that if the incident had occurred at the time of the interview, the company would have utilised the web to provide information to its stakeholders:

We did not handle communications around... (place of incident) .... very well. I think if we had web based technology back then, we would have done a better job with that. [Sic] (Interviewee C1, January 2005)

Interviewee C1 also highlighted the need for utilising the web for communicating significant environmental issues such as environmental incidents:

The motivation for this is to be transparent and allow stakeholders to come to an informed view rather than leaving it in a vacuum, which results in people getting misconceptions on what is going on. (January 2005)

The preceding discussion indicates that Company C regarded the web as a tool for enhancing its transparent environmental communication process with stakeholders. It also provides support for the evolving nature of environmental communication, with the medium having increasing importance over time. The company appeared to be prepared
to incorporate the benefits of the web into its environmental communication process. The interviewees stressed in the final series of interviews that there was always a possibility of expanding the company’s present web based environmental communication approach if the need arose.

Interview responses also suggested that Company C had a strategic intent for web based environmental communication. The company was cognisant of the changing nature of environmental communication and was seeking to incorporate the use of the web into its communication activities. The interviewees acknowledged that other companies in the industry were moving towards such a form of communication. Interviewee C1 posited:

*I think that the web based approach is definitely the way to go. We are strongly moving in that direction; so are a number of our peers.* (March 2004)

However, the interviewees stated that the company was not willing to engage in regular web based environmental communication but was willing to play a ‘waiting game’. The company did not wish to undertake strategic leadership in this area but relied on adopting proven practices. Thus, even though corporate attitudes towards environmental issues, stakeholders and the web was a critical factor that explained web based environmental communication in Company C, the company took a conservative strategic approach towards web based environmental communication.

In summary, the responses from the various interview phases suggests that corporate attitudes and strategic considerations enhanced management’s web based environmental communication needs in relation to presentation and organisation as well as accessibility. However, given that Company C’s strategic intent was conservative, timeliness and interactive needs were restricted by internal organisational factors. The company did not necessarily seek to be a leader in environmental communication and fully adapt to the changing nature of environmental communication. These findings matched the company’s web based environmental communication practice, as observed during the various website analysis stages.

**9.5.2.4 External stakeholder influences**

Interviewee C1 explained the company’s approach towards the identification and prioritisation of its stakeholders:
We do make a judgement about those stakeholders that are core and those that are, I guess, peripheral. So the way we represent this is we have some sort of a stakeholder rope where we have some core stakeholders that we view as most important – shareholders, employees, local and indigenous communities, customers, and then there is the external rope around that core that includes governments, NGOs (non-government organisations) etc. (March 2004)

Thus, Company C assessed stakeholders on the basis of their relevance to its environmental agenda. This assessment was undertaken both proactively by the company as well as through awareness of any ‘new’ stakeholders that could contact the company directly.

This approach towards the identification of stakeholders was also outlined in Company C’s social and environmental reports. The social and environmental reports of the company had a detailed assessment of who its stakeholders were, the relationships the company had with them and how it engaged with them. This information was first communicated in the 2003 report, and further development of this content occurred in subsequent reports.

Company C had a committee consisting of senior internal staff as well as external opinion leaders to provide advice on engagement with stakeholders (Social and Environmental Report, 2004). This committee interacted with key stakeholders. Moreover, Interviewee C1 revealed that the company carried out a survey of its stakeholders each year and the feedback gained from these surveys was used to inform its future engagement processes. The company’s social and environmental report for 2003 also provided details of the stakeholder survey.

Stakeholders also influenced the company’s web based environmental communication, as highlighted in the initial interview. Interviewee C1 revealed:

*I think the business drivers for doing that (web based environmental communication) are pretty clear. But we use that for reaching a range of audiences – employees, NGOs, SRI (socially responsible investment) community, governments, customers, local communities, and the list goes on. One of the reasons for doing that is that a lot of different people are interested in our performance.* (March 2004)
The interviewees revealed that their recent stakeholder survey paved the way for web based environmental communication. Interviewee C1 remarked:

*We did a survey of the report (social and environmental report) last year and the feedback we got from our stakeholders is that while they appreciated all the detailed information that we provided, they did not always require this information. They preferred having specific information provided on the website. So we have moved to a summary hardcopy report and detailed information on the web as a result of this.* (June, 2004)

When queried about the stakeholder perceptions of their approach to web based environmental communication in the final interview, Interviewee C1 replied:

*I think the results of the latest survey confirm that we are on the right track – that the approach we are taking with having most of the data on the web with a relatively slim executive summary is hitting the mark. And people seem very comfortable with that.* (January 2005)

The interviewees also perceived social responsibility analysts and the MCA to be critical stakeholders that influenced their web based environmental communication. The company sought to gain the support of these parties because they had an important role in shaping the perception of the company for other stakeholders. Thus, stakeholder networks (Rowley, 1997) were managed by the company.

Stakeholder preference and competence in relation to web based technologies was raised at the interviews with the Company C interviewees. Interviewee C1 believed that this issue was not such a critical problem for companies in the developed world:

*It is an issue in developing countries, when people may not have access to the web.*

*I think that it is less of an issue here because as long as people can read English, they would probably be able to access the web if they want to get information. Obviously, indigenous people in some locations are illiterate and would not have access to the web, but they would not be able to read the hardcopy report anyway. I think access and preference is an issue, but it is not the main issue.* (March 2004)

Thus, the company considered stakeholder preference and competence but regarded these as issues which could be managed easily. For instance, it was mentioned in the final series of interviews that the company provided a hardcopy version of the web based detailed social and environmental report if it were requested by stakeholders.
In summary, responses from the various interview phases indicates that stakeholder influences also positively contributed towards management’s web based environmental communication needs in relation to accessibility, and presentation and organisation. This supports the evidence of Company C’s extent of web usage observed during the website analysis. These influences, however, were not instrumental in encouraging a need for timeliness and interaction.

9.5.2.5 Summary

<table>
<thead>
<tr>
<th>Contextual influence</th>
<th>Evidence</th>
</tr>
</thead>
<tbody>
<tr>
<td>Technological limitations</td>
<td>These were managed effectively by the company and did not impede current web based environmental communication practices.</td>
</tr>
<tr>
<td>Economic factors</td>
<td>The web was perceived as a cost beneficial medium for environmental communication. Summary social and environmental reports were only produced in hardcopy form. However, economic constraints on use of bulletin boards, chatrooms and discussion fora were mentioned.</td>
</tr>
<tr>
<td>Internal organisational factors</td>
<td>Positive attitudes towards environmental issues, stakeholders and the evolving nature of communication provided an impetus for undertaking web based environmental communication. However, the company’s strategic consideration involved adopting only established practices.</td>
</tr>
<tr>
<td>External stakeholder influences</td>
<td>Stakeholder demand assessed through surveys, and the influence of ‘critical’ stakeholders such as the industry association and social responsibility analysts led to its current web based environmental communication approach. Stakeholder preference and competence in relation to web based environmental communication was managed.</td>
</tr>
</tbody>
</table>

Table 9.6: The impact of contextual influences on web based environmental communication in Company C

Table 9.6 summarises the contextual influences on Company C’s web based environmental communication practice. Technological limitation had a minimal impact on web based environmental communication. Economic factors, internal organisational factors and external stakeholder influences enhanced management’s web based environmental communication needs in relation to accessibility as well as presentation and organisation. Interaction was, however, restricted by economic factors. The strategic intent for web based environmental communication also led to a restricted the need for both interaction and timeliness.
9.5.3 Emerging themes

The double-edged sword nature of the web was mentioned during the interviews. The company also had a change in management in 2001 as a result of its merger. However, the interviewees revealed that this factor did not lead to a change in its environmental communication philosophy. Interviewee C1 was probed in the final interview about whether the extensive changes in the company’s approach to environmental communication from 2001 onwards, as discussed in section 9.3, was a result of the merger. He replied:

> Well, environmental communication evolves all the time. We have changed our reporting and communication practice on a very regular basis in response to community expectations and interests... So I am not sure if it is directly linked to the merger. It is reflective of the fact that this is a dynamic agenda. (January 2005)

9.5.3.1 The web as a double-edged sword

A number of issues raised throughout the interviews at Company C suggested that the communication potential of the web could not be realised in all situations. These issues accorded with descriptions of the ‘double-edged sword’ factor.

The interviewees recognised that the accessibility benefit of the web could not be realised in all situations. Interviewee C1’s views throughout the interviews summed up this issue:

> ... how much time people have to surf the web. If you send them a hardcopy report, it winds up in their in-tray, they have a physical reminder. People will only go to the web if they are looking for something specific. The web is very passive; you need to rely on people coming to the web. (March 2004)

> I think that the main negative is that there are so many websites out there and people don’t have the time to go through them all, so you need to be aware that it is a fairly passive form of communication. If you really want someone to read something, you still need a hardcopy in their in-tray that would grab their attention. (June 2004)

> But the bottom line is that if you are not connecting with people, then it is a waste of time. (January 2005)
The interviewees mentioned that another problem associated with the need for accessibility through the web was that companies could not always precisely identify who the (potential) stakeholders were. Interviewee C1 perceived that there was always a ‘risk’ of not exactly being aware of who the stakeholders were when communicating through the web. He mentioned:

… probably you don’t know who you are communicating with. With hardcopy distributions, we have a mailing list, but with the web, you have no idea. You can track the users and the areas they are interested in but you can’t really identify them, so that is the key challenge. (March 2004)

In this instance, the interviewee was referring to the use of tracking software. Tracking software can be used to identify the Internet protocol address of a computer, thereby providing possible insights into users, such as their institutional affiliation and country of origin. However, detailed information that could identify the individual accessing a website cannot be obtained due to privacy concerns. Thus, in some instances, the multiple addressability feature was also perceived as problematic.

In summary, only the accessibility web based environmental communication need was perceived as having a dual role. The company was, however, able to manage the problematic nature of this need, as is evident from the website analysis findings. As Company C did not extensively require timeliness and interaction through the web, a double-edged view of these needs was not raised in the interviews.

9.6 Summary

Company C used the web as an integral part of its environmental communication. Detailed information was provided on its website and ad hoc communication of environmental issues could also take place on it. Language variety, multiple addressability, multiple cues and externally recordable features were critical in its web based environmental communication practice. The company moderately utilised immediacy and computer processable memory. Personal source and concurrency were primarily utilised in relation to emails and feedback forms during the release of detailed periodic social and environmental reports on the company’s website.

Company C’s web based environmental communication needs centred on the presentation and organisation and accessibility features. Economic factors, corporate
attitudes towards environmental issues, stakeholders and the web medium, strategic considerations and stakeholder demand enhanced these needs. However, even though the company was able to manage the technological limitations and double-edged nature of the communication potential of the web, it was not keen on being a leader in web based environmental communication. It took a conservative approach towards web based environmental communication and mainly relied on adopting proven practices. This conservative strategic approach explains the lack of emphasis on the timeliness and interaction communication needs. Moreover, economic factors also reduced the need for interaction through the web. Figure 9.4 provides a summary of the critical factors affecting Company C’s web based environmental communication practice.
Figure 9.4: Factors impacting Company C’s web based environmental communication practice
Chapter Ten: Cross-Case Analysis

10.1 Introduction

This chapter relates the evidence collected for this study to its objectives via a cross-case analysis. In section 10.2, emphasis is placed on the extent of web usage by companies in the Australian minerals industry and the factors explaining web based environmental communication in the three cases. The current study’s results are also compared to prior studies discussed in the literature review in order to contextualise the current findings. These discussions will enable the central research question for this thesis to be addressed.

The findings of this study extended the research model. The details of this are provided in section 10.3. The research themes are revised and converted into specific research propositions. These represent the analytical generalisations of the research.

10.2 The Research Question and Objectives

10.2.1 The first research objective – the extent of web usage by companies in an environmentally sensitive industry

The first research objective was addressed through a research theme focused on the extent web usage for environmental communication by companies in a particular industry.

10.2.1.1. Research theme one – Extent of web usage

The overview of the Australian minerals industry in section 5.3 indicated that companies can benefit from web based environmental communication. The results of this study, however, indicate that there was variation in the extent of web usage by companies in this industry. The general website analysis in Chapter Six indicated that six companies appeared to be using the web medium more extensively than their counterparts. Of these six companies, two were multinationals whilst another local company went into voluntary administration. Accordingly, the remaining three companies were selected for a detailed analysis in the second phase of this study. The
initial interview data, documentary evidence and longitudinal website analysis highlighted that there were differences in the extent to which the web was utilised by these companies.

In relation to the literature, the initial results of this research support the common finding of section 3.5.1 that a majority of companies are not utilising the web extensively for environmental communication. This study went beyond the general website analysis to assess in depth the extent of web usage for environmental communication by three specific companies in the Australian minerals industry. This analysis highlighted that these companies have sought to increasingly utilise the web for environmental communication.

Company A was a leader in web based environmental communication and undertook continuous communication from March 2004. This development led to the disclosure of general environmental issues, environmental initiatives, quarterly environmental performance data, and environmental incidents on a regular basis throughout the year. Engagement tools included emails and feedback forms. However, immediately after the completion of the primary data collection for this research, this company was taken over by a multinational and its web based environmental communication practice ceased.

Company B initially used the web extensively for environmental communication. However, its website was restructured in March 2004 in order to align it with its parent company’s global website. This development led to a reduction in environmental disclosure and engagement mechanisms on the local website. The company’s web based environmental communication practice was restricted to providing access to annual social and environmental reports and archiving local presentations on social and environmental issues. After the completion of the primary data collection for this research, it was found that Company B’s website was taken offline. It had only a small representation on the parent company’s website.

Company C used the web to communicate detailed environmental issues. Its web based environmental communication practice centred on providing summary annual social and environmental reports and having in-depth details of these on the website. An annual webcast of its social and environmental briefings was also undertaken, and electronic engagement took place through emails and feedback forms. Additional information on
environmental issues was updated either during this time or on an ad hoc basis if these were significant at a particular time.

Table 10.1 illustrates the extent to which the various Media Richness Framework features were utilised by the three companies in relation to their web usage, as explored through the general and longitudinal website analysis. These features are classified on the scale of high, medium or low usage in order to provide a comparative basis for the three companies’ web based environmental communication practice. This classification was informed by each company’s web based environmental communication practice during the period of analysis for this study (July 2003–31 December 2004) and a comparison of their practices, as informed by the cross-case analysis. A comparison with the literature, as discussed in section 3.5.2, was also made.

<table>
<thead>
<tr>
<th>Feature</th>
<th>Company A</th>
<th>Company B</th>
<th>Company C</th>
</tr>
</thead>
<tbody>
<tr>
<td>Immediacy</td>
<td>High</td>
<td>Low</td>
<td>Medium</td>
</tr>
<tr>
<td>Multiple Cues</td>
<td>Medium</td>
<td>Low</td>
<td>High</td>
</tr>
<tr>
<td>Language Variety</td>
<td>High</td>
<td>Medium</td>
<td>High</td>
</tr>
<tr>
<td>Personal Source</td>
<td>Medium</td>
<td>Low</td>
<td>Medium</td>
</tr>
<tr>
<td>Multiple Addressability</td>
<td>High</td>
<td>High</td>
<td>High</td>
</tr>
<tr>
<td>Externally Recordable</td>
<td>High</td>
<td>High</td>
<td>High</td>
</tr>
<tr>
<td>Computer Processable Memory</td>
<td>Medium</td>
<td>Medium</td>
<td>Medium</td>
</tr>
<tr>
<td>Concurrency</td>
<td>Medium</td>
<td>Low</td>
<td>Medium</td>
</tr>
</tbody>
</table>

Table 10.1: The extent of web usage for environmental communication in relation to the Media Richness Framework features as at 31 December 2004

Company A’s use of the immediacy benefit of the web differentiated its practice from the other two companies. It undertook continuous web based environmental communication and utilised a noticeboard to inform stakeholders of changes made to its website. The longitudinal website analysis highlighted that extensive changes in relation to environmental information were made to its website.

The other two companies did make some use of the immediacy feature. Company C used the web for periodic and ad hoc communication. This approach was also observed in Company B’s web based environmental communication practice prior to the restructure of its website.
Adams and Frost (2004) highlighted in their study that companies were not undertaking environmental communication on a regular basis. The current study suggests that while this finding also applied to a majority of companies in the Australian minerals industry, as ascertained through the general website analysis in Chapter Six, the longitudinal website analysis indicated that a particular company sought to utilise the immediacy feature quite extensively. Moreover, while Unerman and Bennett (2004) did not focus specifically on the immediacy criterion, their findings in relation to Shell’s use of its discussion forum do indicate that timely communication was undertaken by the company. Hence, there is potential for companies to incorporate the immediacy feature into their environmental communication practice.

The multiple cues feature used by all companies primarily related to graphics. Company B however made limited usage of the presentation flexibility of the web. These findings are aligned with the industry findings (ascertained through the general website analysis) as well as work by Jones et al. (1999), Rikhardsson et al. (2002) and Andrew (2003). SustainAbility/UNEP (1999, 2001) and Adams and Frost (2004) have also highlighted that companies primarily utilise graphics for web based environmental communication and limit the use of advanced tools such as multimedia and animation. However, in the current study, Company C used audio and video tools for its periodic social and environmental communication when it undertook a webcast of its social and environmental briefing.

The language variety feature was extensively utilised by two companies. Conversely, Company B made moderate use of this feature. Hyperlinks and menus were used to organise and integrate environmental information. These findings are compatible with those for the entire industry. SustainAbility/UNEP (1999, 2001), Jones et al. (1999), Rikhardsson et al. (2002), Andrew (2003) and Adams and Frost (2004) also found an increasing use of hyperlinks and menus by companies. The current study’s findings regarding the use of web portals by two companies supports the results of the SustainAbility/UNEP (2001) study, which is that limited companies have started to utilise specific tools such as web portals as a means of organising environmental information on websites. The general website analysis results also indicate that one other company utilised web portals.
There was moderate use of the personal source features of the web by two companies. Moreover, Company B’s usage of these features declined during the period of analysis. Hyperlinks and menus were not utilised to provide information geared to the needs of different stakeholder groups. However, there was some evidence from the website analysis to suggest that general email alerts were used by the three companies. These findings were also observed during the general website analysis; some of the other companies also utilised general email alerts. SustainAbility/UNEP (2001), Rikhardsson et al. (2002) and Cooper (2003) found a limited use of hyperlinks to provide customised information. Moreover, Adams and Frost (2004) found that email alerts were used by a limited number of companies. Thus, the observations regarding the use of the personal source feature by the companies in this study are consistent with those reported in the literature.

The three companies utilised the multiple addressability of the web. Their website was accessible to any stakeholder who had access to the Internet. No company used mechanisms such as passwords to restrict access to specific components of the environmental section of their website. Thus, the mass communication and global reach of the web was utilised effectively by the three case study companies. This observation is in line with the findings associated with the entire industry. The results support findings from studies by SustainAbility/UNEP (1999, 2001), Jones et al. (1999), Cooper (2003), Unerman and Bennett (2004), and Adams and Frost (2004). These studies also found that the multiple addressability of the website was a critical factor in the uptake of web based environmental communication.

Externally recordable facilities were also widely utilised by the case study companies. These included the ability to download and print current and archived environmental information as well as the use of tracking software to assess the usage of the website by stakeholders. The degree to which all three case study companies and a majority of companies in the general website analysis enabled the printing and downloading of information from websites suggests that, over time, these features have become critical. Earlier studies (SustainAbility/UNEP, 1999, 2001, Rikhardsson et al., 2002) suggested that a limited number of companies were providing such facilities on websites. The use of tracking software by the three companies accords with the findings of the limited literature (Jones et al., 1999, Adams and Frost, 2004) on this subject, which has
highlighted that some companies utilise these mechanisms for their web based communication.

The use of computer processable memory by the three case study companies was focused on search based tools. These results support the general industry findings and prior studies by SustainAbility/UNEP (1999, 2001), Jones et al. (1999), Rikhardsson et al. (2002), Andrew (2003) and Adams and Frost (2004). However, none of the companies used tools that would enable stakeholders to analyse environmental information. This result explains the limited coverage of analytical tools in prior research.

Concurrency was represented by the use of emails and feedback forms for the three companies as well as some of the companies in the general website analysis. However, Company B’s usage of these mechanisms declined during the period of analysis. Sophisticated tools for enabling electronic engagement with stakeholders, such as bulletin boards, discussion fora and chatrooms, were also not evident from the various stages of the website analysis. These results accord with those for the entire industry.

In line with the findings of studies by SustainAbility/UNEP (1999,2001), Jones et al. (1999), Rikhardsson et al. (2002), Cooper (2003) and Adams and Frost (2004) but in contrast to the Unerman and Bennettt (2004) findings, this research found no evidence to suggest that companies were systematically using the web for engaging with their stakeholders. Electronic engagement with stakeholders was restricted to environmental reporting. Limited ad hoc interaction was undertaken through emails and feedback forms. Thus, in line with the recommendations by Adams and Frost (2004), corporations could utilise more sophisticated mechanisms to engage with stakeholders in order to realise the potential benefits of the web for environmental communication. Such engagement could enable companies to enhance their accountability to stakeholders regarding environmental issues.

Even though the literature suggests that the web has the potential to extend environmental reporting to incorporate interactive mechanisms, this study revealed limited evidence of companies using the web to engage with stakeholders. The restricted use of the personal source and concurrency features highlights that
environmental reporting was primarily the focus of web based communication. This indicates that the communication potential of the web was not fully utilised in practice.

Table 10.1 highlights that there are differences in relation to the immediacy and multiple cues criteria across all three companies. There are also differences in the use of language variety, personal source and concurrency between Company B and the other two companies. These variations in the extent of web usage are influenced by a number of factors, which are discussed in the following section.

10.2.2 The second research objective – factors impacting web based environmental communication

The factors that can explain web based environmental communication were established theoretically through the development of the research model and empirically through an investigation of two major research themes—management’s needs for environmental communication through the web medium and contextual influences on these needs. Interviews and documentary evidence were used to interpret the findings from the various website analysis stages. The factors specified in the initial research model were primarily supported, and two other factors emerged from the field.

10.2.2.1 Research theme two – Management’s web based environmental communication needs

Table 10.2 summarises the pattern of relationships between management’s web based environmental communication needs and the actual usage of the web, as evaluated through the Media Richness Framework. It can be seen that the relationships are largely as expected. This supports the premise argued in this research that the extent of use of the features of a medium correspond to environmental communication needs.

The need for the accessibility and organisational capabilities of the web led to extensive use of multiple addressability, language variety and externally recordable features by all three companies. The interviewees acknowledged that the accessibility need could be fulfilled through the mass communication potential of the web and the organisational needs were met by hyperlinks, menus and the tracking capabilities provided by web based technologies. Interviews at companies A and C also indicated that web portals
were critical for web based environmental communication. Tracking software had a critical role in the three companies in assessing the usage of the website by stakeholders, as highlighted by the interview responses.

<table>
<thead>
<tr>
<th>Need</th>
<th>Company A</th>
<th>Company B</th>
<th>Company C</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Importance</td>
<td>Web Usage</td>
<td>Importance</td>
</tr>
<tr>
<td>Timeliness</td>
<td>Critical</td>
<td>High Immediacy</td>
<td>Non-Critical</td>
</tr>
<tr>
<td>Accessibility</td>
<td>Critical</td>
<td>High Multiple Addressability</td>
<td>Critical</td>
</tr>
<tr>
<td>Interaction</td>
<td>Non-Critical</td>
<td>Medium Personal Source and Concurrency</td>
<td>Non-Critical</td>
</tr>
</tbody>
</table>

Table 10.2: Management’s web based environmental communication needs and resulting impact on the extent of web usage as at 31 December 2004

The interviews revealed that organisational needs were also satisfied by search capabilities. This led to extensive use of computer processable memory. However, analytical facilities associated with the computer processable feature were not needed by all three companies. The interviewees perceived analytical tools as something which could be utilised as web based environmental communication evolved.
The interviews indicated that the need for presentation through the web was met by simple features such as graphics. Interviews at two of the companies indicated that Company B and, to some degree, Company A were reluctant to recognise a need for multimedia and animation. This need was critical for Company C, as indicated by the interview responses. This explains the varying use of multiple cues across all three companies.

As discussed in section 3.4.4.2, the presentation flexibility and visibility provided by the web can enhance the way environmental information is presented. For instance, audio and video tools can provide multiple cues for presenting environmental information when compared with a hardcopy report. However, the lack of need for presentation through the web for at least one of the companies suggests that presentation tools are not as critical as the organisational capabilities of the web. Moreover, analytical tools were not perceived to be critical for organising environmental information.

The interviews highlighted that Company A was the only company that recognised the need for timeliness through the web medium. This led to extensive use of the immediacy feature through its continuous web based environmental communication. The interviewees at other companies acknowledged the timeliness benefit provided by the web but were reluctant to adopt this feature in their web based environmental communication practice. Company B’s declining need for timeliness during the period of analysis explained its variation in use of the immediacy feature when compared with Company C.

All three companies were reluctant to recognise the need for interaction through the web. This explains the limited use of the personal source and concurrency features for web based environmental communication. Tools for interacting with stakeholders were acknowledged by the interviewees, but their responses indicated that their companies were not proactively incorporating engagement considerations in their environmental communication strategies. The companies’ web based environmental communication was directed at general stakeholders. Company B’s need for interaction also declined during the period of analysis, resulting in low usage of the personal source and concurrency features.
The interviews highlighted that there was also reluctance by all three companies to recognise more sophisticated means of engagement with stakeholders. Tools such as discussion fora, chatrooms and bulletin boards were not needed by any of the companies. As discussed in section 10.2.1.1, it appeared that web based environmental reporting rather than web based environmental communication was practiced by the three companies.

The lack of a need for interaction through the web by all three companies suggests that traditional means of engaging with stakeholders were more useful to these companies. Given that the primary stakeholders for these companies were the local community, face-to-face communication or direct contact with stakeholders was more useful than web based technologies.

The lack of a need for some of the critical capabilities of web based communication such as presentation, timeliness and interaction by these companies suggests that not all the extensions brought about by the new media (McLuhan, 1964)—namely the web—were incorporated in current web based environmental communication practices. Contextual influences provide an understanding of why certain web based environmental communication needs were critical while others were not. Certain emerging themes also explained current web based environmental communication practices.

10.2.2.2 Research theme three – Contextual influences

The impact of contextual influences on web based environmental communication was explored through their effect on enhancing or constraining management’s web based environmental communication needs. In some instances, some of these factors had no impact on web based environmental communication. Accordingly, the term ‘no effect’ is used to describe this finding. This classification is similar to that used for analysing management’s web based environmental communication needs, with the findings for each case and the cross-case analysis being utilised. Comparisons with the research discussed in section 4.3 are also made. Table 10.3 summarises the effect of the various contextual influences.
<table>
<thead>
<tr>
<th>Company A</th>
<th>Company B</th>
<th>Company C</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Technological Limitations</strong></td>
<td>No effect</td>
<td>Constrained Timeliness and Interaction</td>
</tr>
<tr>
<td><strong>Economic factors</strong></td>
<td>Enhanced Timeliness, Presentation and Organisation, Accessibility</td>
<td>Enhanced Presentation and Organisation, Accessibility</td>
</tr>
<tr>
<td></td>
<td>Constrained Interaction</td>
<td>Constrained Interaction</td>
</tr>
<tr>
<td><strong>Internal Organisational factors</strong></td>
<td>Enhanced Timeliness, Presentation and Organisation, Accessibility</td>
<td>Enhanced Presentation and Organisation, Accessibility</td>
</tr>
<tr>
<td></td>
<td>Enhanced Organisation, Accessibility</td>
<td>Constrained Presentation, Timeliness and Interaction</td>
</tr>
<tr>
<td></td>
<td>Constrained Interaction</td>
<td>Enhanced Presentation and Organisation, Accessibility</td>
</tr>
<tr>
<td><strong>External Stakeholder Influence</strong></td>
<td>Enhanced Timeliness Presentation and Organisation, Accessibility</td>
<td>Enhanced Presentation and Organisation, Accessibility</td>
</tr>
<tr>
<td></td>
<td>Enhanced Organisation, Accessibility</td>
<td>Constrained Presentation and Organisation</td>
</tr>
<tr>
<td></td>
<td>Constrained Interaction</td>
<td>Enhanced Presentation and Organisation, Accessibility</td>
</tr>
</tbody>
</table>

Table 10.3: The impact of contextual influences on management’s web based environmental communication needs as at 31 December 2004

Interviews indicated that extensive funding was available for investment in information and communication technology in the three companies. Thus, technological limitations such as security (Ashbaugh et al., 1999; Trites, 1999) and website design and promotion (ACCA 2001b) were not a major problem for these companies. The interview responses indicated that there was an extensive emphasis on enhancing security features on websites coupled with a focus on effective website design and promotion.

The interviews also highlighted that the other possible technological limitations were managed by two of the companies. Most of the environmental content on websites was audited and considered to be relevant for the general needs of a range of stakeholders. However, authenticity (Ashbaugh et al., 1999; Trites, 1999; FASB, 2000; Ettredge et al., 2001; SustainAbility/UNEP, 2001) and overload of information (Lymer et al., 1999; Trites, 1999) were perceived as problematic by the interviewees at Company B. These
were managed by limiting the need for timely and interactive web based environmental communication features.

The explanation of current web based environmental communication practices of companies was also influenced by other contextual factors. These included economic factors, internal organisational factors and external stakeholder influences.

In line with Ullmann (1985), economic issues had an impact on web based environmental communication. The interviews highlighted that the focus was on the costs and benefits of matching communication needs with web based technologies. Economic factors provided an impetus for undertaking web based environmental communication in Companies A and C. Studies such as those by Ashbaugh et al. (1999), Trites (1999), Lymer et al. (1999), FASB (2000) and Ettredge et al. (2001) have also found that the web is perceived to be a cost effective communication medium. The interview responses, however, suggested that Company B’s web based environmental communication practice was not influenced by economic issues.

Conversely, economic factors also restricted the use of more advanced means of interaction in companies A and C. This finding is synonymous with the findings of the study by Adams and Frost (2004), which highlighted that economic factors could in fact restrict web based environmental communication. However, with the exception of timeliness for Company C and interactive needs for companies A and C, other web based environmental communication needs were enhanced by economic factors in two companies.

The Adams (2002) finding on internal organisational factors in relation to corporate attitudes and processes was a critical factor which explained web based environmental practices. All three companies had positive attitudes towards the environment and stakeholders. This was evident from the interview responses and their social and environmental reports. The interviews also highlighted that these corporations considered the web to be a useful medium within the evolving nature of communication. Companies A and C sought to utilise the web extensively for environmental communication. Conversely, it appeared from the interviews that Company B’s attitude towards the web medium was more conservative. This finding also explains to some
extent the differences in the web based environmental communication practice of the three companies.

The interviewees in all the three companies perceived that by having environmental information communicated through the website, companies would be regarded as transparent by stakeholders. Varying levels of strategic intent were evident in the web based environmental communication practice of the three companies.

Company A was a leader in web based environmental communication until it was taken over. This was reflected by its web based environmental communication practice of 2004. It had a corporate emphasis on being a leader in environmental communication, as highlighted by the documentary evidence. The views of the interviewees suggested that the company sought to set an example for other companies in the minerals industry by undertaking continuous web based environmental communication.

Company B made limited use of some of the features of the web, as highlighted by the longitudinal website analysis. This conservative strategic position led to a focus only on the organisation and accessibility needs for web based environmental communication.

Company C’s strategic approach was conservative and relied on only adopting proven practices. It is interesting to note that its approach to web based environmental communication from 2003 onwards (summary reports with specific details on website) was similar to the approach Company A started in 2001 before it adopted continuous web based environmental communication.

Company A’s approach to the use of the web suggests that, as is the case with leaders in environmental communication in the print media, as identified by SustainAbility (2000, 2002, 2004), leaders in web based environmental communication can be identified. The conservative use of the web was highlighted by the practices of companies B and C. Adams and Frost (2004) also found that many companies in their study were not willing to adopt all the tools provided by the web for environmental communication.

The strategic use of the web for environmental communication by the companies in this study also indicates that the web can be used for impression management. This was found in research by Campbell and Beck (2004), which was discussed in section 3.5.1.
Web usage for environmental communication is also prompted by strategic internal organisational factors. This highlights that companies are able to portray to their stakeholders that they are transparent, thereby enabling them to manage stakeholder impressions.

In summary, in relation to internal organisational factors, corporate attitudes enhanced the need for accessibility and organisation through the web for all three companies and the need for presentation for companies A and C. Company A’s strategic intent in relation to web based environmental communication also enhanced its timeliness need. Moreover, a conservative strategic intent in relation to companies B and C led to a constraint on the timeliness and interaction web based environmental communication need in both companies and a constraint on presentation in Company B.

In line with the arguments of Ullmann (1985), the interview findings suggest that stakeholder influence was a critical factor that explained the existing practice of the three companies. The interviews and documents highlighted that stakeholder issues influenced the three corporations’ environmental communication, leading to varying degrees of web usage across the companies. The Minerals Council of Australia (MCA) and non-governmental organisations (NGOs) were examples of stakeholder networks (Rowley, 1997) that encouraged web based environmental communication. The interviews revealed that Company A also liaised with its external advisory group while Company C undertook a stakeholder survey. The feedback from these encouraged an increase in the use of the web for environmental communication.

Stakeholder demand enhanced the web based environmental communication needs for organisation and accessibility in all three companies, presentation in companies A and C, and timeliness in Company A. Concerns over stakeholder preference and competence were raised at companies A and B and these restricted the need for interaction in Company A, and presentation and organisation in Company B. These findings are compatible with findings by SustainAbility/UNEP (1999, 2001) and ACCA (2001b), which have indicated that stakeholder preference and accessibility can restrict the use of the web for environmental communication.
10.2.2.3 Research theme four - Emerging themes

It was found that the use of the web was affected by certain critical factors, which were uncovered from the field. These have been referred to as the double-edged sword and a change in management philosophy.

Management’s web based communication needs can have a double-edged effect. This critical factor, which emerged from the interviews, has been largely unexplored in the literature. The double-edged sword concept has the potential to restrict web based communication. This finding suggests that companies had to carefully consider how they were going to utilise the benefits of the web for environmental communication and overcome its potential dual negative effects. The double-edged sword nature of the web can also explain the limited use of the web by certain companies in the Adams and Frost (2004) study. The results of that study highlighted that the companies were not willing to use the web strategically for environmental communication.

The problems with realising the accessibility need was raised by all the interviewees. It was therefore acknowledged that the web was not always accessible to all stakeholders. Moreover, interviewees at Company B recognised that web based presentation needs can also be detrimental as they can impede stakeholder accessibility. Organisational needs can also be detrimental, as highlighted from interviews in Company B. This results in a balanced approach towards web based environmental communication.

The problematic nature of timely communication through the web, as identified by Interviewee A2, can explain the reluctance by companies B and C to undertake continuous web based environmental communication. It appeared that these companies were not equipped to handle immediate feedback from their stakeholders. Moreover, the double-edged sword factor can also explain the unwillingness by the three corporations to utilise the interactive benefits of the web. Electronic interaction with stakeholders can result in a company being subjected to unnecessary stakeholder pressure. Further, selective electronic interaction with certain stakeholders can also lead to criticism from other stakeholders. This leads to the current ‘general’ web based interactive approach employed by the three companies.
The onus was on companies to successfully use the web for environmental communication, given the dual effect of its communication potential. Company A was able to realise the communication potential of the web (especially its timeliness feature) and incorporate it into its environmental communication more effectively than the other two companies.

In summary, the double-edged sword is a critical factor that has the potential to constrain management’s web based environmental communication needs. While the interviews indicated that this factor restricted the need for presentation through the web in Company B, a broader application of this principle suggests that it could explain the lack of need for timeliness in two companies and the low emphasis given to interactive capabilities in all three companies.

The change in management philosophy finding in this research was also raised in the study by Campbell (2000), which was discussed in section 2.5.4. The change in chairman of Marks and Spencer influenced its social and environmental disclosure at certain times. The evidence related to the change in management philosophy presented here suggests that this factor is critical because it has the potential to restrict web based environmental communication.

Company A was one of the leaders in web based environmental communication which had an abrupt halt to its practice, as identified in the postscript stage of the longitudinal website analysis. The company had two changes in management over a few years. Whilst the earlier change maintained its need to be a leader in environmental communication, the later change, as a result of the takeover, led to the abandoning of its web based environmental communication practice.

Company B was also restricted in its web usage for environmental communication. The longitudinal website analysis and interviews highlighted that this company had to restructure the environmental section of its website and was later only able to communicate environmental issues through the parent company’s website. The change in management philosophy initially reduced the need for timeliness and interaction through the web in the company and later led to its abandoning of its local website for environmental communication, as highlighted by the postscript stage of the longitudinal website analysis.
Even though there was a change in management in Company C through the merger of two companies, the interview responses suggested that this issue did not restrict its web based environmental communication practice. The interviewees mentioned that the Australian company approach towards environmental communication was a fundamental aspect of the combined company’s environmental communication process. This finding was also confirmed through an analysis of the social and environmental reports of Company C, as discussed in section 9.3. It appeared that because the company was involved in a merger rather than being taken over, the adverse impacts on environmental communication did not eventuate.

In summary, the prima facie evidence indicates that a change in management philosophy was a crucial factor that had the potential to override both management’s existing web based environmental communication needs and contextual influences and to cease existing practices. It appeared that this factor was critical if the change in management occurred as a result of a takeover. Other changes in management, as occurred in Company A (a change in CEO) and Company C (a merger of two companies), did not lead to changes in the environmental communication philosophy.

10.2.3 Central Research Question revisited

The central research question for thesis, as discussed in the first chapter, is as follows:

What are the factors that influence the extent to which the web is utilised by corporations in an environmentally sensitive industry to communicate with their stakeholders in relation to environmental issues?

Given that the research objectives and associated themes have been addressed, the central research question can now be addressed. Table 10.4 summarises the various factors that influence the extent to which the web is utilised for environmental communication. It shows the findings that matched the research model and those which emerged from the field.

Timeliness through the web medium was critical only to Company A. This need was enhanced by economic factors, internal organisational factors and external stakeholder influences. On the other hand, the lack of a need for timeliness in the other two
<table>
<thead>
<tr>
<th><strong>Factor</strong></th>
<th><strong>Impact</strong></th>
<th><strong>Evidence</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Timeliness</strong></td>
<td>As model suggests, affects the extent of use of the immediacy feature.</td>
<td>Explained the varying degrees of immediacy in the three companies.</td>
</tr>
<tr>
<td><strong>Presentation and Organisation</strong></td>
<td>As model suggests, affects the extent of use of multiple cues, language variety externally recordable, computer processable memory, and personal source features.</td>
<td>Explained the use of multiple cues, language variety, externally recordable and computer processable memory features in all the companies. But need for organisation did not lead to an increase in the use of analytical tools (computer processable memory) and the personal source feature in any company.</td>
</tr>
<tr>
<td><strong>Accessibility</strong></td>
<td>As model suggests, corresponds to the use of the multiple addressability feature.</td>
<td>Explained increasing use of the multiple addressability feature in all three cases.</td>
</tr>
<tr>
<td><strong>Interaction</strong></td>
<td>As model suggests, impacts the use of personal source and concurrency feature.</td>
<td>Explained moderate use of personal source and concurrency in two companies and the declining use of these features in one company.</td>
</tr>
<tr>
<td><strong>Technological Limitations</strong></td>
<td>Model suggested that security problems, poor website design and promotion, information overload and information authenticity could restrict current practices.</td>
<td>Only information authenticity and overload restricted the need for timeliness and interaction in one company.</td>
</tr>
<tr>
<td><strong>Economic Factors</strong></td>
<td>Model indicated that this factor could both enhance and restrict web based environmental communication practices.</td>
<td>Explained web usage in two of the companies. Enhanced the need for presentation and organisation, and accessibility, and restricted need for interaction in both companies. Enhanced the need for timeliness in one of these companies.</td>
</tr>
<tr>
<td><strong>Internal Organisational Factors</strong></td>
<td>Model highlighted that corporate attitudes towards environmental issues, stakeholders and the web could enhance web based environmental communication. Posited that strategic use of the web could lead to variation in web based environmental communication across companies.</td>
<td>Corporate attitudes enhanced need for organisation and accessibility in all three companies and presentation in two. This factor and strategic considerations enhanced need for timeliness in one company. Strategic considerations restricted the need for timeliness and interaction in the other two and presentation in one company.</td>
</tr>
<tr>
<td><strong>External Stakeholder influences</strong></td>
<td>Model suggested that stakeholder demand could both enhance and restrict web based environmental communication (lack of demand). Stakeholder preference and competence could also restrict web based environmental communication according to the research model.</td>
<td>Stakeholder demand enhanced organisation and accessibility in all companies, presentation in two companies and timeliness in one company. Stakeholder preference and competence restricted interaction in one company, and presentation and organisation in another company.</td>
</tr>
<tr>
<td><strong>Double-edged sword</strong></td>
<td>Field result that suggests web based environmental communication needs could be a double-edged sword.</td>
<td>Restricted presentation in one company and could explain reduced need for timeliness in two companies and interaction in all three companies.</td>
</tr>
<tr>
<td><strong>Change in management philosophy</strong></td>
<td>Field result that suggests change in management philosophy could impact web based environmental communication.</td>
<td>Restricted the entire web based environmental communication practice in one company. Another company had reduction in timeliness and interaction initially and later restrictions in the entire web based environmental communication practice.</td>
</tr>
</tbody>
</table>

Table 10.4: The factors affecting the extent to which the web was utilised for environmental communication
companies can be explained through constraints imposed by internal organisational strategic processes and the double-edged sword factor. Technological limitations and the initial change in management philosophy also reduced the need for timeliness in Company B. These factors explained the varying use of immediacy across all three companies.

The need for presentation and organisation through the web medium in the three companies varied. Company B required a need only for organisation whilst the other two companies required both presentation and organisation. Internal organisational factors and external stakeholder influences enhanced the need for organisation in all three companies. Economic factors also enhanced this need in companies A and C. Moreover, economic factors, internal organisational factors and external stakeholder influences enhanced the need for presentation in companies A and C. On the other hand, the double-edged sword effect, internal organisational factors and external stakeholder influences constrained the need for presentation in Company B. These factors explained the use of multiple cues, language variety, externally recordable and computer processable memory features, as observed in each company’s web based environmental communication practice during the period of analysis. However, a need for organisation did not translate into the use of personal source or the analytical tools associated with computer processable memory in any of the companies.

A need for accessibility through the web was enhanced by internal organisational factors and external stakeholder influences in all three companies. Economic factors also enhanced accessibility in companies A and C. These factors explain the increasing use of the multiple addressability feature in all three companies.

There was a limited need for web based interaction in all three companies. The double-edged sword factor explained the lack of need for interaction in all three companies. External stakeholder influences restricted this need for interaction in Company A while economic factors restricted interaction in companies A and C. Technological limitations and the initial change in management philosophy also reduced interaction in Company B, in conjunction with internal organisational factors, which reduced this need for Company C as well. Thus, these factors explain why personal source and concurrency did not have extensive use in any of the companies.
Organisation and accessibility were therefore the most critical web based environmental communication needs in this study. They were enhanced by a number of contextual factors. Given that local communities are critical stakeholders for mining companies, the double-edged sword and certain contextual factors reduced the need for timeliness, presentation and interaction through the web for most of the companies in the minerals industry. However, the increasing need for timeliness in Company A and presentation in Company C (incorporation of audio and video tools) suggests that there has been a gradual adoption of the communication potential of the web in this industry, albeit by a few companies which were able to manage the double-edged sword factor and contextual influences on their web based environmental communication needs. Moreover, the change in management philosophy factor was the critical factor that explained the events of the postscript phase in companies A and B.

In summary, the web based environmental communication needs identified in the initial research model primarily explained the extent of web usage in relation to the Media Richness Framework characteristics. However, the study provided insights into the effect of contextual influences on management’s web based environmental communication needs. These varied across all three companies. Moreover, certain emerging themes also had an impact on web based environmental communication. Given the findings highlighted here, the research model can be extended and specific research propositions can be formulated.

10.3 Revised Model and Propositions

This research utilised the case study approach (Hagg & Hedlund, 1979; Yin, 2003a, 2003b; Scapens, 2004), whereby an initial research model based on prior theoretical constructs was used to analyse the data for this study. As discussed in the preceding section, the model provided an explanation for a majority of the findings. However, two findings which were not specified in the initial model also partially explained the web based environmental communication practice. Consequently, in line with case study research (Otley & Berry, 1994; Humphrey & Scapens, 1996; Yin, 2003a, 2003b), findings from the field extended the research model for this study, as is illustrated in Figure 10.1. This model represents the analytical generalisations of this study.
Figure 10.1: The revised research model

Management’s Web based Environmental Communication Needs

- Timeliness
- Presentation and organisation
- Accessibility
- Interaction

Contextual Factors

- Technological Limitations
- Economic Factors
- Internal Organisational Factors
- External Stakeholder Influences
- Change in Management Philosophy

Extent of Web usage

- Immediacy
- Multiple Cues
- Language variety
- Personal Source
- Multiple Addressability
- Externally recordable
- Computer Processable memory
- Concurrency

Change in Management Philosophy

Double-edged sword
The analytical generalisations that characterise this research indicate that environmental communication through the web medium is a complex process that requires the management of web based environmental communication needs and associated contextual influences. The communication needs that require web usage need to be assessed in relation to particular contexts so that the double-edged sword effect of the web does not lead to undesirable consequences. Contextual influences also need to be considered so that the communication potential of the web is effectively utilised and the associated limitations managed. However, a change in management philosophy is a particular factor that has the potential to supersede all other factors and lead to restricted use of the web.

The findings from the field revised and extended the themes for this thesis. They can now be stated as propositions. These propositions are as follows:

*Research Proposition 1*

The extent of the use of the web for environmental communication can be established through an assessment of the use of the communication potential of the web. The criteria for assessing the communication potential of the web consists of immediacy, multiple cues, language variety, personal cues, multiple addressability, externally recordable, computer processable memory and concurrency.

*Research Proposition 2a*

Management’s web based environmental communication needs affect the extent of web usage. These needs include timeliness, presentation and organisation, accessibility, and interaction. The use of the potential of the web therefore requires management’s recognition of these factors as critical components of their communication needs.

*Research Proposition 2b*

The use of the web for environmental communication can be a doubled-edged sword because web based communication needs can lead to undesirable
consequences in some instances. Thus, the double-edged role of communication needs has to be managed in order for the potential of the web to be utilised in practice.

Research Proposition 3

Contextual factors influence management’s web based environmental communication needs and consequently affect the extent of web usage. These include technological limitations, economic issues, internal organisational factors, external stakeholder influences and a change in management philosophy.

Research Proposition 4

A change in management philosophy is a critical issue which has the potential to override management’s existing web based environmental communication needs and contextual influences and thereby restrict web based environmental communication.

Research Proposition 5

Management’s web based environmental communication needs, the double-edged nature of these needs, contextual influences and a change in management philosophy are critical in influencing the extent to which the web is utilised for environmental communication.

10.4 Summary

This chapter reports the results of a cross-case analysis used to develop analytical generalisations. In relation to the first research objective, it was found that there was variation in the extent to which the web was utilised by the three companies. These differences can be attributed to the use of specific Media Richness Framework features. The findings also indicate that environmental reporting was the primary focus of web based environmental communication and that there was the restricted use of engagement mechanisms by the three companies.
The findings in relation to the second research objective suggest that management’s web based environmental communication needs were primarily linked to the extent to which the web was utilised for environmental communication. In line with the extent of web usage, these factors varied among the three companies. Company A required timeliness in addition to the accessibility, and organisation, requirements of the other two companies. Presentation was also critical for companies A and C when compared with Company B. A lack of need for interaction in all three companies explained the primary focus on environmental reporting in current web based environmental practices.

These web based environmental communication needs were influenced by contextual factors. While technological limitations were not such a major contextual issue for two companies, internal organisational factors and external stakeholder influences for all the companies, and economic issues for two companies, were critical in explaining the variation in the extent of web usage by these companies. Moreover, emerging themes such as the double-edged sword effect and a change in management philosophy were critical influences on web based environmental communication.

A comparison with prior studies indicated that this study has contributed to the literature on web based environmental communication through its analysis of current practices in the Australian minerals industry. The research model was revised and a number of propositions were developed.
Chapter Eleven: Conclusion

11.1 Introduction

This section provides a general overview of the preceding chapters of this thesis. The structure for the current chapter is then articulated.

This thesis commenced with the following research question:

_What are the factors that influence the extent to which the web is utilised by corporations in an environmentally sensitive industry to communicate with their stakeholders in relation to environmental issues?_

The central research question was related to two specific objectives in the first chapter. These sought to establish the extent of web usage for environmental communication in the Australian minerals industry and to ascertain the factors which can explain the web based environmental communication practices of specific companies in the Australian minerals industry. Chapter One also provided details on the scope of this research and its justification as well as the theoretical perspective and methodological issues related to addressing the research objectives.

This study’s theoretical perspective was expanded further in the next three chapters. The critical importance of environmental issues and the ensuing relationship between corporations and stakeholders was discussed in Chapter Two. Environmental communication was perceived as a possible approach that could be utilised by corporations to manage stakeholders in relation to environmental issues. This process was taken to include environmental reporting as well as engagement with stakeholders. The theoretical perspectives in relation to environmental communication were then reviewed. It was highlighted through an analysis of prior literature that the widely utilised stakeholder and legitimacy theory perspectives have focused primarily on environmental reporting and provide limited insights into the medium for environmental communication.

Chapter Three addressed the gaps in the environmental communication literature identified in the previous chapter by developing the Media Richness Framework and
applying it to the medium for environmental communication. The potential of the web for extending the capabilities of the traditional environmental communication media was highlighted. Media Richness Framework extends the literature on web based environmental communication by providing a basis for assessing the extent of web usage for environmental communication. Whilst this framework provides the means for assessing the communication potential of the web, the use of this potential in practice is influenced by a number of factors. This is another issue that has not been explored in depth in past research.

Chapter Four developed the research model for this study by incorporating the Media Richness Framework to assess the extent of web usage. It also identified management’s web based environmental communication needs and contextual influences as potential factors that could explain this usage. Specific themes were developed on the basis of this model to guide the research process.

Chapter Five justified the case study approach and context for this research and developed the research design. Website monitoring, interviews and documentary evidence were the research methods for this study. The data collection through the use of these methods involved a general research phase followed by a company specific phase. The data were analysed on an individual and cross-case basis through the pattern matching approach. Research soundness was also critical to this study. The cases were compiled into a multiple case report, whereby individual cases were initially discussed before a cross-case analysis was undertaken. Potential limitations in relation to the chosen methodology and the use of specific methods were also highlighted in this chapter.

The next four chapters presented the findings of the two phases of this research. A general overview of web based environmental communication in the Australian minerals industry in Chapter Six was used to select three companies as cases for the second phase of this study. Chapters seven to nine reported the results of interviews, documents and the longitudinal website analysis to highlight the web based environmental communication practice of each company.

The penultimate chapter of this thesis provided a cross-case analysis of the results of this study. This study was also compared to the literature on web based environmental
communication. Extensions to the research model were identified and research propositions were developed.

Section 11.2 summarises the significance of the major findings of this study. Section 11.3 reports the contributions of this study. Section 11.4 identifies the limitations of the current research and these provide scope for future research. Future research opportunities are discussed in section 11.5. Section 11.6 concludes the thesis by arguing for an increasing emphasis to be placed on the medium of environmental communication.

11.2 Significance of Research Findings

11.2.1 The first research objective – the extent of web usage

This study has developed the Media Richness Framework to provide a basis for assessing the extent to which the communication potential of the web is utilised by corporations for communicating environmental issues to stakeholders. As discussed in section 1.1, the web has the potential to enhance the corporate communication process (Newhagen & Rafaeli, 1996; Richardson & Scholz, 2000; Ihator, 2001; Walther et al., 2005). It is argued in this research that the web is a comparatively rich medium for communicating environmental issues when compared with other media for environmental communication because it extends the capabilities of the traditional media (McLuhan, 1964). The Media Richness Framework characteristics therefore provide the means to assess the usage of the ‘extended capabilities’ of the web medium in actual practice.

This study has implications for future research on web based environmental communication. It highlights that in order to assess the extent to which the web is utilised for communicating environmental issues to stakeholders, researchers should assess the communication potential of the web rather than merely assessing the extent of environmental information content conveyed on websites. Whilst the studies discussed in section 3.5 indicate that there is variation in the assessment of the communication potential in academic literature, these lack a consistent framework that could capture the extent of web usage. The Media Richness Framework therefore provides a basis for
future studies that seek to assess the extent to which the web is utilised for environmental communication in different contexts.

The findings associated with the first research objective suggest that even in an environmentally sensitive industry with extensive stakeholder pressures, not all of the potential capabilities of the web are utilised in practice. These results in relation to the entire minerals industry as well as the three companies indicate that the richness of the web medium is not the sole criterion for explaining the use of the web for communicating with stakeholders about environmental issues. A number of factors can explain the extent of web usage in practice.

11.2.2 The second research objective – factors impacting web based environmental communication

This research has argued that while the web has communication potential, the extent of use of this potential is determined by management’s web based environmental communication needs. It is further argued that these needs are influenced by contextual factors.

Timeliness, presentation and organisation, accessibility and interaction web based environmental communication needs can have varying impacts on the use of the web medium. These needs affect the extent to which the capabilities of the web, conceptualised through the Media Richness Framework, are utilised in practice. This study has established through its analytical generalisations that the organisational and accessibility web based environmental communication needs are more pronounced than other needs. The positive influence of economic, internal organisational and external stakeholder issues overrides the constraints imposed by technological limitations and the double-edged sword effect. Conversely, presentation, timeliness and interaction through the web are not always needed. These are affected by economic factors, internal organisational factors, external stakeholder issues, technological limitations and the double-edged sword factor. Moreover, a change in management philosophy factor could supersede all of management’s existing web based environmental communication needs and lead to limited or no use of the web medium.

These findings affect future research and show that web based environmental communication is affected by a range of potential factors. Prior research suggests that
legitimacy theory provides a sound theoretical basis for the understanding of current environmental communication practices (Deegan, 2002). This study, however, posits that the effect of the use of a particular medium for environmental communication is such that existing theories are inadequate for understanding current practices. Stakeholder and legitimacy considerations partially represented the internal organisational (corporate attitudes) and external stakeholder influences in this research model. However, communication and technological considerations (communication needs, technological limitations), Ullmann’s stakeholder framework (economic factors, stakeholder influence and strategic posture) and Adams’ internal organisational factors (corporate attitudes and resulting processes) provided the foundations for a research model that was able to capture the factors influencing web based environmental communication in a particular environmentally sensitive industry. Findings from the field included the double-edged sword effect and a change in management philosophy. These also explained current web environmental communication practices.

Future research into environmental communication should consider the impact of the use of particular medium. The evidence in this thesis suggests that the use of a particular communication medium—the web—is affected by a range of factors that have the potential to explain current practices. Thus, theoretically informed research should consider that explanations related to the use of a particular medium have the potential to explain current environmental communication practices. A need therefore arises for expanding present theoretical perspectives on environmental communication.

11.3 Research Contributions

This research responds to calls by Gray (2002) to embrace more thorough and useful scholarship into environmental issues that will assist in enhancing species survival and improving the quality of life for future generations. The critical nature of environmental issues, as highlighted in section 2.2, is not only supported by recent scientific insights such as Flannery (2005) and the report of Intergovernmental Panel on Climate Change49 but also includes political (Gore, 2006) and economic (Stern, 2006) arguments. Thus, there is an increasing emphasis on the need for interdisciplinary research in relation to environmental issues.

The study examined a mechanism—web based environmental communication—which has the potential to enhance the corporate accountability of environmental issues to stakeholders and contribute to sustainable business practices. This research has made theoretical and methodological contributions and has implications for practice and policy.

11.3.1 Theoretical

This study has developed the notion of environmental communication to highlight that environmental reporting is often accompanied by engagement with stakeholders. The research literature (see for example, Roberts, 1992; Gray et al., 1995; Deegan & Gordon, 1996; Neu et al., 1998; Deegan et al., 2002) has primarily emphasised environmental reporting and given limited consideration to the interactions between a company and its stakeholders. The use of the web extends this notion further by highlighting that the medium can facilitate communication with stakeholders rather than merely enabling reporting.

As indicated in the earlier chapters, there is limited literature on web based environmental communication. The emphasis in prior studies has been primarily on environmental reporting through conventional print media such as annual reports or social and environmental reports (Roberts, 1992; Gray et al., 1995; Deegan & Gordon, 1996; Neu et al., 1998; O'Donovan, 1999, 2002a; Deegan et al., 2002). This study has addressed the evolving nature of environmental communication. It has highlight that, over time, the importance of environmental issues and increasing stakeholder pressures on corporate environmental performance has led to a need for a medium that can extend the capabilities of traditional communication media. The web has the potential to facilitate such environmental communication. This study sought to address the extent to which this potential was utilised in practice and the factors that influenced actual usage. Thus, the study advances the literature on environmental communication and provides an impetus for further studies in this area.

Existing studies on web based environmental communication are general, descriptive and lack a theory to explain current practices (Jones et al., 1999; Craven & Otsmani, 1999; Williams & Pei, 1999; Patten, 2002; Rikhardsson et al., 2002; Andrew, 2003; Cormier & Magnan, 2003; Adams & Frost, 2004). The majority of these studies has
focused on information content and how such information is disclosed on websites. The present study went further. It developed and revised a research model to establish the factors which influence the extent to which the web is utilised in practice for environmental communication.

As discussed in section 2.5.4, the literature has utilised stakeholder and legitimacy theory to explain environmental communication practice. Whilst these theoretical positions have been applied extensively in a majority of studies, they do not provide in-depth insights into the impact of a particular medium on environmental communication. Media richness theory (Daft & Lengel, 1984, 1986; Sproull, 1991; Valacich et al., 1993) addresses this gap in the literature by focusing on the medium for communication.

Most media richness theory studies to date have focused on internal communication, whereby emphasis is on communication within an organisation. The use of the web as an external communication medium has largely been unexplored. Prior studies have also not incorporated additional criteria for media richness which can explain the potential of modern communication technologies (see for example, D’Ambra, 1998; Dennis & Kinney, 1998). This study addressed these research gaps by developing the Media Richness Framework to outline specific criteria that can enable comparison of the ‘richness’ of the various media for external communication.

The Media Richness Framework provides a means for assessing the extent to which the potential provided by the web for environmental communication is actually utilised in practice. It was used to develop the research model, which provided an explanation of the factors which influence the extent to which the web was utilised to communicate environmental information to stakeholders in a particular industry. As such, it expands existing literature on web based environmental communication. The research model used in this study can be replicated and even extended in other studies so that the salient factors that contribute to web usage for environmental communication in different contexts can be captured.

Llewelyn’s (2003) five levels of theorising can be used to highlight the theoretical contributions of this research. Her classification of theories involves a continuum of metaphor, differentiation, conceptualisation, context bound and grand theorising. A metaphor is the lowest level of theorisation. It creates meaning and significance through
the development of particular descriptive notions. Differentiation extends this notion by considering the categories and contrasts that underpin particular notions. Conceptualisation, as the name suggests, creates specific concepts that have significance and meaning. An example could be the notion of accountability, a concept that is widely accepted in society. Context dependent theorising develops an in-depth understanding of specific settings. This form of theorising can include, for example, the major organisation theories such as legitimacy and institutional theory. The highest level of theorisation is a grand theory, which is an overall general theory for societal structures. This can be found in the work of, for example, Habermas and Marx.

The development of the notion of environmental communication and the Media Richness Framework in this research reflect conceptual theorising. These concepts can be used in various contexts to address the issues related to the communication of environmental issues, to assess the richness of the communication medium and to describe the extent of use of the web for environmental communication. Conversely, the revised research model for this study is a context dependent theory which provides an understanding of the factors influencing the use of the web in an environmentally sensitive industry with extensive stakeholder pressures.

11.3.2 **Methods**

Currently, there is a lack of published literature on the methods that can be utilised for analysing environmental communication through the web. This study has developed specific methods for web based environmental communication by undertaking an in-depth study of present practices in the Australian minerals industry. The current study has potential implications for the methods to be used in future research on web based environmental communication.

The majority of existing studies analysing environmental disclosure through the web have applied techniques similar to those used for the content analysis of print media reports (Craven & Otsmani, 1999; Williams & Pei, 1999; Patten, 2002; Cormier & Magnan, 2003; Patten & Crampton, 2004). This study extends the work of Adams and Frost (2004) by focusing on the communication potential of the web. The Media Richness Framework was utilised to assess the use of the web medium for communication rather than to content analyse environmental information on websites.
Further, most prior studies have studied environmental communication at a particular point in time (Jones et al., 1999; Craven & Otsmani, 1999; Williams & Pei, 1999; Patten, 2002; Rikhardsson et al., 2002; Andrew, 2003; Cormier & Magnan, 2003; Patten & Crampton, 2004). In line with Adams and Frost (2004), this research acknowledged the dynamic nature of information dissemination through the web. It explored web based environmental communication on a longitudinal basis through a continual monitoring of specific corporate websites.

The extensive changes in the web based environmental communication practice of the three companies in this study could be captured only through a longitudinal analysis. A cross-sectional study would not have been effective in highlighting how specific events such as the decision to undertake continuous environmental communication, change in management and webcasts impacted web based environmental communication. Thus, continuous website monitoring enabled an in-depth and specific understanding to be gained of web based environmental communication practices.

This study also posits that the entire website of a company should be monitored in order to capture the changes made in relation to environmental issues. It is not sufficient to merely analyse the environmental or social responsibility sections, as environmental issues could be communicated with other corporate issues on a website. The general and longitudinal website analysis for this study provided evidence of a number of instances where environmental issues were communicated with other corporate issues.

Most studies on environmental communication have undertaken a content analysis of reports or websites on an ex post basis. Conversely, this study adopted a similar approach to that undertaken in studies by SustainAbility/UNEP (1999), Jones et al. (1999) and Adams and Frost (2004), as discussed in section 3.5.1. It used multiple methods comprising website monitoring, interviews of key corporate personnel and documentary evidence to gain an in-depth understanding of the current practice of web based environmental communication. This study supports recent literature (Adams & Larrinaga-Gonzalez, 2007), which stresses the need for social and environmental accounting researchers to engage with the practice.

This study has highlighted that web based environmental communication is a multi-disciplinary approach. Therefore, it is critical to determine the personnel involved in this
process. In the current study, even though initial interviews were held with environmental/sustainability staff, an attempt was made to identify the relevant personnel involved in this activity. Thus, interviews in future research on web based environmental communication should be held not only with environmental/sustainability staff but also other personnel, such as those involved in corporate communications.

Prolonged engagement was a critical part of the research process for this study. The in-depth data gathered for this study provides support for this approach. Data were collected in relation to the general and company specific phases. The website analysis was held over the general, longitudinal and postscript stages and documents were analysed throughout the research. These methods informed the in-depth interviews, which were held over three different phases. Such engagement in the field over a considerable period provided an in-depth understanding of current practices. It indicates that the evidence collected to support research themes were not restricted to a snapshot of current practices but encompassed a comprehensive account of the practice.

11.3.3 Practice

In practice, whilst there have been numerous initiatives and guidelines for environmental communication, such as, for instance, the global reporting initiative, AA1000 and the guidelines for triple bottom line reporting in Australia, as is discussed in section 2.5.1, these have not identified the role a medium has in the environmental communication practice. The emphasis in these guidelines has been on disclosure through conventional print media. Thus, a need arose for a study into the present practice of web based environmental communication, with the Australian minerals industry providing a useful context for the research. The in-depth study indicated that the web was a useful medium which extends the capabilities of traditional communication media and that there were specific companies in the Australian minerals industry which were increasingly utilising the web for environmental communication.

The findings of this research assist practitioners by providing an in-depth understanding of the existing practice of environmental communication in the Australian Minerals Industry. Whilst these findings are limited to the particular companies whose practices were studied, the current study offers useful insights for web based environmental
communication practices through its analytical generalisations. This research is beneficial to those companies seeking to engage in the practice of web based environmental communication as it enables an understanding of the factors that influence the use of the web for environmental communication.

The current study suggests that accessibility and organisation web based environmental communication needs can be realised by most companies that intend to complement their existing environmental communication practice with the use of the web medium. On the other hand, timeliness, presentation and interaction web based communication needs will be dependent on the extent to which the companies are willing to extend their present practices to take advantage of the potential of the web. An understanding of technological limitations, the double-edged sword effect, economic factors, internal organisational factors, external stakeholder influences and change in management philosophy will enable managers to assess their web based environmental communication needs in different contexts and ensure that the selection of the web is aligned with corporate needs (Hendersen & Venkataraman, 1997). In essence, this research suggests that practitioners should consider the extent of web usage for environmental communication on the basis of their environmental communication needs and contextual factors.

Moreover, an understanding of the present practice of web based environmental communication in the Australian minerals industry is beneficial to stakeholders. They can gain insights into the critical impact of the web on environmental communication and its current constraints and become aware of the effect of them on their existing communication relationship with companies. Certain stakeholders such as non-governmental organisations (NGOs), industry associations or even regulators could also apply the understanding gained from this study for their own use of the web for environmental communication. Thus, this study has implications for environmental communication for companies and stakeholders in most industries.

11.3.4 Policy

Investigation of the use of an alternative medium for corporate environmental communication can be of interest to regulators, policy makers and other stakeholders. The findings of this research signify to governments and industry associations the
usefulness of the web medium for environmental communication and the constraints on its current usage. They can play a vital role in relation to the development of mandatory and voluntary initiatives, which can facilitate the use of the web for corporate environmental communication. Stakeholders such as NGOs can also lobby for initiatives and guidelines that enable web based environmental communication. These initiatives can guide companies in relation to the different contexts in which the web can be used to communicate environmental information and how the existing deterrents to web based communication can be managed.

The policy implications for this research can apply to other industries. The study has broader policy implications in relation to issues such as effective use of web based technologies and the accessibility of such technologies to various stakeholders. For instance, to enable effective use of the multiple cues offered by the web (such as audio and video tools), the existing communication network in Australia could be upgraded. The availability of web based technologies in remote locations is another issue that needs to be addressed. Thus, in addition to benefiting practitioners, this research is useful to policymakers and other stakeholders.

11.4 Limitations of the Research

This study was primarily focused on environmental issues in order to provide a specific context for this research. Corporate communication through the web, however, does not always distinguish between social and environmental issues. The environmental focus does not limit the value of this research because communication processes are the same regardless of whether social or environmental issues are communicated. The evidence for this research clearly highlighted that environmental issues dominate communication on the web.

This research was primarily focused on the use of the web for environmental communication. Recent research indicates that companies use a range of media to communicate environmental issues (Frost et al., 2005). Whilst this study did make comparisons with other communication media, data collection was primarily focused on the use of the communication potential of the web in order to address the central research question for this study. This thesis aimed to provide an in-depth understanding of the corporate use of the web medium through an analysis of the factors that influence
web usage. As a consequence, the findings of this study are restricted to the use of the web medium.

Given that the scope of this study was restricted to the communication of environmental issues through the web, the overall corporate communication process in organisations was not explored. The use of the web for communicating environmental issues is part of an organisation’s overall corporate communication process (Adams & Frost, 2004). However, the data from the interviews in this study highlighted that web based environmental communication for the three companies was a critical component of each organisation’s corporate communication and that this practice provided sufficient scope for an in-depth study. As discussed in sections 1.3 and 5.3, the environmentally sensitive nature of the Australian minerals industry highlights that environmental communication has a critical role in the corporate communication process of companies in this industry. The web can be a useful tool for enabling corporate environmental communication as opposed to merely marketing.

This study focused on the use of the web as an environmental communication medium; it placed limited emphasis on web content. Therefore, one cannot assess whether the environmental disclosure on websites was related to critical issues or was merely an attempt to improve the public relations of a company. As argued in this section, this study had a clearly defined context and theoretical perspective. The incorporation of content issues would have made it difficult to manage this project.

This research was focused on a corporate perspective and did not seek views directly from stakeholders. Stakeholder perceptions could have provided further insights into web based environmental communication. However, the time constraints for this research led to a focus on a corporate context. Some insights into stakeholder issues was gained from the companies as external stakeholder influences on web based environmental communication was a critical factor that was investigated in this study.

11.5 Suggestions for Future Research

Several potential research avenues provide scope for future studies in web based environmental communication. These can address some of the limitations identified in the preceding section.
The research model developed in this thesis can be applied to studies of different contexts. It would be useful to undertake studies of other industries, particularly environmentally sensitive industries in Australia or globally. The research model can also be revised and applied to those industries that do not have highly visible environmental impacts and/or constant stakeholder pressures. Studies using larger sample sizes can also be undertaken in order to extend the explanatory power of the research model. These studies could include the use of surveys to complement website monitoring and interviews.

Future studies do not necessarily have to be restricted to the communication of environmental issues; social and environmental issues or even specific social issues can be investigated. The use of the web for the communication of specific environmental issues, such as, for example, environmental incidents, could also be investigated.

The research model for this study can also be revised and applied to other forms of corporate communication so that explanations for the use of the potential of the web for communicating a range of corporate issues can be addressed. Studies could investigate the emphasis given to the use of the web as a medium for facilitating different types of communication and explore the factors that influence the decision processes guiding the selection of the web as a communication medium.

Future studies can focus on the information content associated with web based environmental communication. For instance, the social and environmental information communicated on websites can be compared with independent information on the company obtained through sources such as news media and industry reports. Such studies can enable its social and environmental performance to be matched with its communication. Adams (2004) used such an approach for assessing social and environmental reporting through hardcopy reports. This approach can be extended to incorporate corporate websites, which have the potential to provide increased and timely information.

Recent research has explored stakeholder views on environmental communication. For instance, O’Dwyer et al. (2005a) have explored user needs in sustainability reporting through a survey of stakeholders in Ireland. Stakeholder perceptions of web based environmental communication can also be investigated through interviews and surveys.
The extent to which the web is effectively utilised for environmental communication is partially dependent on stakeholders. Stakeholder opinions on how the web should be utilised for environmental communication are therefore essential. Their views can provide insights into whether they are aware of the evolving nature of environmental communication and have recognised the potential benefits and restrictions to web based environmental communication. Their past experiences in relation to this practice could also be explored.

This research indicated that a change in management philosophy, which arose as a result of takeovers, restricts web based environmental communication. A specific study investigating this issue can be undertaken so that an improved understanding of the impact of a change in management philosophy on web based environmental communication can be gained. For instance, it would be of interest to explore whether multinationals in certain countries with stringent legal issues are more concerned about the web based environmental communication of their subsidiaries when compared with multinationals in other countries.

The use of intranets for internal environmental communication as well as in conjunction with extranets for communication with selected stakeholders can also be investigated. Such studies could provide valuable insights into the extent to which web based technologies enhance communication within and across organisations. An example could be the use of extranets during an environmental collaboration between a company and an NGO.

Whilst the existing literature has explored social and environmental information content in a range of media (Zeghal & Ahmed, 1990; Tilt, 2001; Frost et al., 2005), there is a need for studies that consider the potential of the different media available to communicate social and environmental issues. The current study can be extended to consider the communication potential of a range of media, such as annual reports, social and environmental reports, media releases, newsletters, advertisements, brochures and the web. Such studies can even focus specifically on particular social or environmental issues. For instance, Unerman and Guthrie (2007) focused on the media used for intellectual capital reporting in the United Kingdom.
Studies into the use of the potential of the web should not be restricted to corporate communication. O'Dwyer et al. (2005b) have extended the environmental communication literature by focusing on NGOs. The extent to which stakeholders such as NGOs, regulators and industry associations use the web to communicate environmental issues could also be studied. Recent literature has explored the information content on NGO websites (Gallhofer et al., 2006; Tilt et al., 2006). Therefore, research in social and environmental accounting can extend beyond corporate practices.

Counter accounting, which involves providing alternative independent accounts of corporate performance (Gallhofer et al., 2006), can be enhanced through the use of the communication potential of the web. There is a need for studies that can provide an in-depth understanding of the use of this potential in practice and the factors influencing the use of the web for counter accounting.

The prolonged engagement approach undertaken in this study could be applied to other field studies. These studies could provide a comprehensive account of current practices and do not have to be restricted specifically to social and environmental issues.

As highlighted in section 11.2.2, there is a need for expanding our theoretical understanding of environmental communication. This study, through a focus on a particular communication medium—the web—has highlighted that the impact of the medium used for environmental communication requires conceptual insights that extend current theories. Thus, future studies in environmental communication should not be merely restricted to stakeholder and legitimacy theory. They need to explore a range of potential factors that could explain present practices.

11.6 Summary

This study has highlighted that the web extends the capabilities of traditional environmental communication media. The analytical generalisations that arose from a study of specific companies in the Australian minerals industry indicate that a range of factors influence the extent to which the web can be utilised for environmental communication.
Management’s web based environmental communication needs were the primary influence on the extent of web usage. These needs included timeliness, presentation and organisation, accessibility and interaction. Contextual factors influenced these needs. These include technological, economic, organisational and stakeholder influences. Moreover, the double-edged nature of web based environmental communication and a change in management philosophy were critical factors identified from the field. The former highlights that communication needs cannot always be addressed through the web; in some instances, the benefits of the web can lead to undesirable consequences. A change in management philosophy has the potential to supersede all other factors and reduce the extent to which the web is utilised for environmental communication.

These analytical generalisations were used to develop a (revised) research model which identified the salient factors influencing web based environmental communication. The factors identified in this study can be applied to other studies to extend the theorisation undertaken in this study. Such studies could increasingly emphasise the medium for environmental communication in theory and practice to demonstrate how the ‘medium is the message’.
Appendices

Appendix One: Information Sheet

THE AUSTRALIAN NATIONAL UNIVERSITY

HUMAN RESEARCH ETHICS

Information Sheet

RESEARCH TOPIC: Corporate Environmental Communication in the Australian Minerals Industry: A Study into the use of the World Wide Web

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RESEARCH DESCRIPTION

Aims: This study will examine the role the World Wide Web (web) has in the environmental communication practice of companies in the Australian Minerals Industry. It will analyse the processes through which the web is used to communicate environmental information and the personnel who are involved in this practice. Focus will be on the extent to which the communication potential of the web is utilised for environmental communication and the factors that influence the use of the web for such communication.

Methods: It is planned to conduct case studies of company environmental communication practices. This will involve interviews with personnel of companies in the minerals industry in order to seek their views on the process of environmental communication through the web. The interviews will be complemented by analysis of relevant documents such as annual reports and social and environmental reports, as well as an analysis of the corporate website.

Outcomes: The results of this research will enable an in-depth understanding of the extent to which the communication potential of the web is utilised by companies in the Australian
minerals industry and identify the different factors that influence the use of the web for corporate environmental communication. These findings are broader than merely being confined to the particular companies whose practices will be studied. This research will also be beneficial to those companies that may seek to engage in the practice of web based environmental communication.

The study has implications for policies for environmental communication for all companies in the Australian Minerals Industry. It will indicate to the industry association whether initiatives are needed to provide an impetus for communication of environmental information through the web. Results of this study will be made widely available to individual companies as well as the Minerals Council of Australia.

PARTICIPATION AND WITHDRAWAL

Participation in this research is in the form of in-depth interviews, which are intended to be carried out with personnel involved in the web based environmental communication practice of the organisation. Interviews will be recorded with the permission of the interviewees and should last between 30 minutes to two hours. These are likely to be conducted at the organisation or at any other venue convenient for the interviewees.

Consent for interviews would mean that the company could be used as a case study for this research. A transcription of the interview will be provided to the interviewees for their confirmation. In addition to the interviews, other non-confidential documents will be sought.

Participation is voluntary for this research. Subjects also have the option to withdraw from interviews.

CONFIDENTIALITY ISSUES

All data provided (mainly from interview transcripts) would be kept confidential. Identity suppression is a key part of this research process in order to maintain confidentiality.

The identity of the organisation and the interviewees will be kept confidential. Interviews will be analysed on the basis of common themes or categories that would emerge, and interviewees will be referred to as Interviewee A, B, etc, rather than in terms of their individual identities.

DATA PROTECTION

The researcher and his principal supervisor will be the only individuals who will have access to the research data that comprises of interview transcripts, relevant documents and details of the analysis of websites. These will be stored in a locked filing cabinet in the researcher’s office.

FEEDBACK

A summary of the findings associated with this research will be sent to the research subjects. Meetings can also be arranged to discuss these findings.

CONTACTS

Any ethical issues of concern can be directed to the ANU Human Research Ethics Committee C/O Mrs Sylvia Deutsch, Human Ethics Officer, Research Services Office, 6125 2900 or email Human.Ethics.Officer@anu.edu.au.

Other issues related to this research study can be directed to the researcher.

THANK YOU
Appendix Two: Presentations related to the PhD

Conference Presentations


Seminar Presentations


Research Colloquia where ideas related to PhD have been presented


- Interdisciplinary Perspectives on Accounting (IPA), doctoral colloquium in July (July 2003). Madrid, Spain.


- Critical Perspectives on Accounting (CPA) conference new scholars colloquium (25 April 2002), New York, US.
References


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Ernst & Ernst. (1976 et seq.) Social Responsibility Disclosure. Ernst & Ernst, Cleveland, Ohio.


