ENVIRONMENTAL COMMUNICATION AND SUSTAINABLE DEVELOPMENT IN MALAYSIA: AN ANALYSIS ON ENVIRONMENTAL NGOs WEBSITES DESIGN

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ABSTRACT

Environmental concern has become increasingly integrated into the public domain and mainstream, traditional, and new media. Investigations into the phenomena of environmental communication (EC) using online advocacy are increasingly trans-disciplinary endeavors. My research question focused on how the websites design of the environmental NGOs in Malaysia (ENGOM) can effectively support the sustainability development in Malaysia. The result shows that the majority of the ENGOM websites met the 'well designed' requirements. The outcome of this study can especially helps environmental organisations develop the Internet and the web strategies which take into account the issues examined herein, in order to best utilise this medium for their purposes. The usability test was suggested to evaluate the user's point of view regarding what constitutes an effective and well designed environmental website.

Keywords: environmental communication; environmental NGOs, homepage, internet, web design, web page, website.

INTRODUCTION

Malaysia as a developing country has endeavored since the 1970s, to introduce a variety of regulatory measures in order to balance the goals of socio-economic development and the maintenance of sound environmental conditions. These objectives were also spelt in the Outline Perspective Plans, and Vision 2020. A draft of National Policy on the environment has also been prepared, which is currently under consideration by the Government, reemphasizing the principles and practices of long-term environmentally sound and sustainable development (SD) (Ministry of Science, Technology and the Environment, 2002).

Two international events mark the evolution of SD over the past three decades, the Stockholm conference of 1972 and the Rio conference of 1992. Those two conferences are significant because they represent the formal institutional result of the public's demand that governments address the growing environmental crises (Pudin 2002). In this sense, that the two conferences are the culmination of prior periods of international environment struggles while also marking the beginning of new periods of political activity.

The environmental dimension of SD is predicated on maintaining the long term integrity and therefore productivity of the planet's life support systems and environmental infrastructure. A blue print for action towards SD, Agenda 21, was established in Rio de

Janeiro in 1992 during the United Nations Conference on Environment and Development (UNCED). It is a plan to achieve a sustainable society in this environmentally and economically inequitable world. One of the elements available in Chapter 36, Agenda 21 stresses that:

> *"Education, including formal education, public awareness and training, should be recognized as a process by which human beings and societies can reach their fullest potential……..Both formal and non formal education are indispensable to changing people's attitude so that they have the capacity to assess and address their sustainable development concerns".*

With rapid population increase and economic growth in many countries including Malaysia, the environment is becoming more vulnerable and natural resources are depleted faster to meet the basic needs. Environmental communication (EC) is one of the tools that helps to achieve SD. Through the process of EC, individuals obtain an understanding of the concepts of and knowledge about the environment. Public awareness is critical for achieving environmental and ethical awareness, values and attitudes, skills and behavior consistent with SD. In order to achieve the SD through public awareness, mediums like radio, television, newspapers have been used ever since to communicate to the public and also to educate them. The newest media, i.e. the Internet now seems to be more popular among environmental NGOs. The Internet is developing and being adopted by environmental advocacy groups in developed countries with great impact in creating public awareness (Spencer, 2004). As the Internet is still new for Malaysian environmental Non Government Organisations (NGOs), they should grab the opportunity to decide on the Internet to communicate environmental issues and matters effectively to the public at large.

Despite the wealth of information available from the sizeable body of literature into international environmental groups and their use of the Internet, certain questions are still unanswered with regards to Malaysia. Among the questions are: is the sites adequately designed to inform the public about SD in Malaysia and to encourage the citizens to take action for the environment; how do the website's characteristics influence, promote action or inform about the environmental issues, how and to what extent do the web design or layout elements of the web can influence and express SD in Malaysia?

Both the government and the environmental NGOs in Malaysia (ENGOM) continue to advocate national efforts to address such issues and involve in many environmental local programmes with all projects aiming towards the conservation of the biodiversity and ecosystems and the SD. If the Internet really is to serve the ENGOM, it must be clear how it can be most effectively used. In Malaysia, the environment began to receive more attention in the early 1970s (Pudin et al., 2002). It is crucial to study the ENGOM and their websites because we want to look not only at how the site visitors can navigate and perform particular actions on a site, but as how a site facilitates actions and meets needs beyond itself and how a site functions rhetorically, meeting particular purposes for particular audiences. There might be vast differences in terms of web presence in the nature of their presentation, contents and context when examined across the globe.

We also need to study the environmental advocacy websites since they hardly receive attention (Spencer, 2002). Studying websites that try to educate, change people's minds, or compel action might help us see what some real designers and decision makers do while making websites, how their goals and values are reflected in their sites, and how people interact with the sites. Therefore, Malaysia can provide a useful case study of how

ENGOMs are communicating using the websites for SD in Malaysia. This study also aims to produce outputs which will later be useful to the other local environmentalists who use or aim to use the websites to support the SD in Malaysia. The findings of this research later will have the potential to help organisations, collectives and individuals develop the Internet strategies which will take into account the issues that will be examined herein, in order to best utilize the websites to support the SD in Malaysia.

LITERATURE REVIEW

Alongside the major international environmental organisations in the world, there exists a plethora of usually often more localised, smaller and much less formally structured environmental advocacy groups in Malaysia. These groups are often called grassroots groups. These groups are often comprised of people who are concerned about what is happening in their area, people who do not feel that the mainstream organisations are effectively addressing the key issues, or the people who want to make their own decisions about how to combat environmental destruction, rather than working within the structures of larger organisations (White 1999). Substantively, the role of NGOs was recognised when the NGOs, including the environmental NGOs were given a specific chapter in Agenda 21, entitled Strengthening The Role of Non-governmental Organizations: Partners for Sustainable Development. Although the final version of the chapter was watered down by the government representatives, many people still view it as the most extensive, formalised recognition of the actual and potential contributions of NGOs (Robinson,1993).

Environmental advocacy is now on the Internet. The National Environmental Directory (n.d.) listed 12,704 organisations in the United States that are related to be the advocacy of environmental activism. It was also shown from this list that about 3,187 members, or one-quarter, provided websites. These numbers are growing, and such expansion is also evident in many countries in the world. Undoubtedly, the potential advantages of using the Internet was felt and realised by many NGOs and organisations (Landesman, 1955).

The question becomes of how environmental advocacy groups are portraying the reality of the advocacy in the medium of the Internet. More specifically, it may provide a basis for considering what environmental advocacy groups may want to gain from the Internet, if this new medium is to play an important role in helping to communicate and support SD in Malaysia. White (1999) in her research "Environmental activism and Internet" finds out that most of the environmental advocacy groups have adapted Internet strategies to portray their offline structures, missions, goals, and activities. She surveyed 79 environmental groups and their uses of Internet and indicates that none of the groups that she surveyed had indicated begun using the Internet prior to 1984.

The dynamic nature of the use of the Internet by environmental advocacy groups clearly illustrates the flexibility and adaptability of both the environmental advocacy groups and the Internet itself. They have established their websites for a variety of reasons: to build awareness, to facilitate training programs, to reduce costs, to raise funds, to mange information, to disseminate information, to communicate with personnel, or to avoid travel costs! (Landesmann, 1997, Srinivas 2005). Previous researches indicate that there are few elements which are considered important for the Internet, such as the design interactivity, navigation, etc. In the context of this thesis, the researcher focuses on the web design or the appearance of the website.

Sehmel (2004) says that web designers have more options than most other communicators, and many of their choices about text, color, sound, tone, etc. interact with one another. Web designers often struggle to design websites to meet the audience's needs. They continue studying web design, they conduct usability tests, and they otherwise strive to learn more about design and their audiences. However, many organisational traits may prevent advocacy group staff from being able to make better decisions about how to use websites.

Pohl (2003a) emphasises that apart from the quality information and navigation, a successful Internet communication is strongly dependent on the layout presentation. According to the author, it was learnt that the ARC site he evaluated failed to effectively communicate its goals because the design and the layout elements of the website were distracting. Pohl (2003a) recommends to decrease the amount of content on each page and link to secondary that provide additional information, add more headlines, use larger spacing, and smaller chunks of text would highlight important information, facilitate scanning and reading, and help visitors to feel comfortable with the amount of data provided on each page. Pohl (2004) stresses that it would be appropriate for the main page of each section within the site to contain only introductory or summary information, with secondary pages that provide more comprehensive and detailed information for interested visitors.

The web design is one of the important attributes towards the establishment of good and effective websites (Nielsen, 2000). It is an important aspect of visual arts and illustration of a web design, and perhaps it is also the most essential form of visual layout of a web design. Sinha et al. (n.d.) highlighted that a well designed website is "…more than just a pretty homepage and it does not have to be cutting edge or trendy. Good design is high quality, appropriated, and relevant for the audience and the message it is supporting. It communicates a visual experience and may even take your breadth away". The web design allows people to access the content (Nielsen, 2000). In the perspective of an effective web-designing, a web page should have the following features: intuitive; easy to navigate; easy to use; consistent; accessible; appropriate; interesting; fast; and fun (Chen & Sheldon, 1997; Nielsen, 1998). Poorly developed web designs affect the overall experience and may deter visitors to find the relevant information on the sites, and ability to search for information.

Graphic is part of design, and it creates visual logic or visual presentation and layout. Graphic seeks an optimal balance between visual sensation and graphic information (Ivory, 2003). Sykes (1997) says that although bandwidth limits the use of too many graphics, this limitation should not translate into a static and non attractive site. Measuring web presentation from the design point of view requires evaluating the visuals; layout; graphics, colour palettes combination; amount of information displayed; the overall organisation of information gelled with sitemaps; navigation bars; form design, font styles and sizes, and the aesthetic appeal of the website (Spencer, 2002; Ivory, 2003). These elements add to perceptions of web organisational credibility. Without those mentioned elements, web pages are graphically uninviting and not attractive, and will not be appealing to viewers. A careful, systematic approach to page design can simplify navigation, reduce user errors, and make it easier for viewers to take advantage of the information and features of the site. The spatial organisation of graphic and text on the web page can engage readers with graphic impact, direct viewer's attention, prioritise the information they see, and make their interactions with the website more efficient (Lynch & Horton, 1999, 2002). Nielsen (2000) also noted that the appearance or presence of the website seems to be the first thing that users

see; therefore, page design is crucial. The web design criteria suggested by Nielsen (2000) generally reflected what had been applied by Karen McLachlan (2002). The eight criteria were i) homepage speed, ii) homepage attractiveness, iii) use of navigation links, iv) use of multimedia, v) browser compatibility, vi) content presentation, vii) information currency, and viii) availability of further information.

Sehmel (2001, 2002a, 2002b, 2004) explored the use of the Internet tools, strategies, and design features useful for ENGOs seeking to educate, influence behaviours and values, induce action; etc. indicated that environmental websites should develop the design of the web to be able to facilitate searching abilities, and support the tasks and the goals of the users. As designing website interrelates with many other websites elements and components such as interactivity and navigation, it is imperative that web designers should know what and how to design and use the capabilities and the capacities of web media to facilitate interactive functionality and navigation functionality to communicate the environmental group's mission and goals in supporting SD. However, ENGOs face budget problems when it comes to producing a well designed websites. Sehmel (2002a) said that many companies and organisations hire full time web designers to help make design and content decisions for their websites; nevertheless she added that some groups do not have sufficient budget to do this.

The failure to make inviting, attractive and appealing design, for example, in the case where the text cannot be read, the images, the layout, the graphics or the embedded pictures are too crowded or too large, the colour is too dull or too much, and the sound files are used with no reason, will only drive away the visitors from specific sites (Sykes, 1997). Winn and Beck (2002) without exemption supported the above importance and stated that the design elements of the websites have power to persuade, and those attribute to more successful websites.

Based on the literature it is therefore imperative, that each and every design needs continuous evaluation and reflection. Like the usability and usefulness of information on the web pages, it is difficult to be adamant on specific criterion that makes a particular web design as the best design. Web design needs to be further investigated and evaluated. Web design depends a lot on the context and the purpose of the websites. As such, Nielsen (n.d.) indicated that heuristic evaluation is difficult to be conducted in order to find all the usability problems, and therefore needs continuous evaluation. It is however important to realize, as been elaborated in this section that web design is particularly important for the well being of any given websites. Therefore, for environmental organisations that want to maximise their websites' impact on the visitors must ascertain that they carefully plan all the feature requirements of a good web design for their websites.

METHODOLOGY

This study is a case study whereby five ENGOM websites have been evaluated extensively. Yin (1995) says that case studies can be extensively helpful in exploratory research that seeks to describe a situation about which relatively little is known - which explains that there is little empirical research available on environmental advocacy groups' websites in term of their development and uses in supporting the SD . A case study can permit deep involvement with environmental advocacy groups and provide a basis for making constructive and meaningful suggestions to them. On top of that, little research has been conducted on smaller organisations such as environmental non profit groups; an obviously no such study has been conducted on ENGOMs.

The five ENGOMs chosen for the case study were selected based on the following criteria:

- They were among the earliest pioneers, popular and active players in environmental issues in Malaysia
- They represent both West and East Malaysia and concentrate on different issues: general, specific or localised issues.
- They have some uniqueness and differences as they may play their roles at different levels (local, national, regional, and international). They can be searched via the Yahoo and Google Search Engines
- They have reasonably good and well developed websites.

After undergoing the process of selection, the nineteen ENGOMs registered under Malaysian Environmental NGOs (MENGO) were reduced to a short list. Using the set of criteria provided, of the nineteen ENGOMs the results showed that only five of them were chosen for this thesis. They are:

i) Centre for Environment, Technology & Development, Malaysia; (CETDEM);
ii) Environmental Management and Research Association of Malaysia (ENSEARCH);
iii) Malaysian Nature Society (MNS);
iv) Sahabat Alam Malaysia (SAM) / Friends of the Earth Malaysia; and
v) World Wildlife Fund (WWF) Malaysia.

The time that the websites were analysed and the real time for data collection must be clearly specified in this study since the WWW is constantly undergoing evolutionary change (Bauer & Scharl, 2000). The data collection or the examination of the five ENGOM websites was carried out in June 2008; and not at any point before or after that. This website content analysis reflects the state of the five ENGOM websites as June, 2008. At the time of writing this article, some of these sites had been redesigned and had improved their offerings, both in their breadth and depth. In fact, some of them have changed their website address. These changes, however, were not sufficient to cause a change in the findings and recommendations in this thesis.

In this study, researcher analysed the content of the websites according to hierarchical structure of website content. Most sites depend on hierarchies, moving from the most general overview of the site (the homepage), down through increasingly specific submenus and content pages (Nielsen, 2000). The hierarchy was built from the most important or general concepts down to the most specific or detailed topics. The hierarchical structure was designed with a homepage at the top of the tree and several major submenus within branches of the tree. A site level is accessed by a browser, traversing the site according to hierarchy and in breadth-first manner, beginning from the homepage. Because all the five ENGOM websites were organised around a single homepage, hierarchical schemes were particularly suited to website organisation with well-organised material. In the hierarchical structure, the websites reflect the site levels such as Level 0 (homepage), Level 1, Level 2, Level 3, and so on with deeper linkages that are called 'deep links' such as 1st deep link, 2nd deep link, and so on (Nielsen, 2000; Symonenko, 2006, 2007). Deep links enable other sites to point users to the exact spot on your site that is of interest of those users (Nielsen, 2000). Ivory (2003), Nielsen (2000) and Symonenko (2006, 2007) identified levels of websites as: Level 0 is the homepage, Level 1 refers to pages one link or one click away from the homepage, Level 2 refers to pages one link away from the level one pages, and so on. The homepage

is the very top level of the hierarchy and it is a flagship of the site, and normally has different designing elements compared to other pages, such as a larger logo and a more prominent placement of the company name or site name, and a more prominent placement of the company name or site name (Nielsen, 2000). Ivory (2003) and Nielsen (2000) revealed the analysis of homepages indicated that homepages had measurably different characteristics than the other pages. Symonenko (2006, 2007) stressed that normally on the corporate homepages there were links to About, Products/Services, and Contact content categories which corporate homepages directed their visitors. The information or the content on Level 1, Level 2, and Level 3 of the websites were normally geared towards the respective topics or audiences (Symonenko, 2006).

In this particular study, four ENGOM websites levels were analysed, i.e. something in between what Brinck et al. (2001) and Morville and Rosenfeld (2002) suggested: that a 3-5 level hierarchy is the ideal level or maximum depth that users are willing to trace and the fourth level reveals indication to be a threshold whereby the websites break out into sub-sites of individual division and began to show loss of their institutional uniformity after the 3rd level.

To evaluate the design of ENGOM websites, researcher adopted the eight web design criteria "WWW CyberGuide", developed by Karen McLahlan (2002) and as suggested by Nielsen (2000). The eight criteria were i) homepage speed, ii) homepage attractiveness, iii) use of navigation links, iv) use of multimedia, v) browser compatibility, vi) content presentation, vii) information currency, and viii) availability of further information. From the eight design criteria, the following twenty-four units of analysis as per following were coded to gather the data.

1.Homepage downloads efficiently
2. Homepage attractiveness
3. Can tell where you are
4. Clear index, table of content
5. Clear site sponsor
6. Information for contacting sponsor
7. Copyright date established
8. User able to move with ease
9. Help tool is provided
10. Directions are easy to follow
11. Links are helpful
12.Internal/external links work properly
13. Graphics serve clear purpose
14. Graphics make significant contribution
15. Equally effective for all browsers
16. Sufficient information
17. Information clearly organised
18. Same basic format used constantly
19. Information is easy to find
20. Lists of links are well organised
21. Date last updated clearly labelled
22. Out-dated material is removed
23. Feedback link is available
24. Other web links provided

The numbers of units coded available under the categories of design available had been statistically summed up or quantified. How was the presence or the availability of the units evaluated quantitatively? The following is the example how the value was given to the units: Value "1" or "/" was given to the units 'available' or 'present' on the site. Value "0" or "X" was given to the units 'not available' or 'not present' on the site. The general census was given based on the total number of design features available on the sites: i) 20-24 = very well designed; ii) 15-19 = well designed; iii) 10-14 = moderately well designed; iv) 5- 9 = poorly designed; and v) 1-4 = very poorly designed.

FINDINGS

Table 1 below shows the overall results of the evaluation of the design of ENGOM websites.

	Availability of web design features (units 71-94)	Percentage	Design Classification
MNS	19/24	79.16	Well designed
WWFM	13/24	54.16	Moderately well designed
SAM	7/24	29.16	Poorly designed
ENSEARCH	17/24	70.83	Well designed
CETDEM	16/24	66.66	Well designed

Table 1:Design features of ENGOM websites

Table 1 explains that out of twenty four design features evaluated quantitatively on ENGOMs' websites, MNS had nineteen (79.16%), WWFM had thirteen (54.16%) SAM had seven (29.16%), ENSEARCH had seventeen (70.83%), and CETDEM had sixteen (66.66%) design features present on its site. Therefore, the result indicates that MNS site, ENSEARCH site, and CETDEM were well designed, WWFM site was moderately well designed, and SAM site was poorly designed.

DISCUSSION

The findings indicated that the website design features existed quite substantially on most of the ENGOM websites as shown in Table 1. Mc Lachlan (2002) listed twenty-four features for a well- designed website, and ENGOM websites design feature was evaluated based on the presence of the criteria. The availability of those features indicated that the ENGOM websites design had effectively supported the SD in Malaysia. The findings had been supported by Ivory (2003); Lynch and Horton (2002); Nielsen (2000); Nielsen and Norman (2000); Pohl (2003a, 2003b); Scharl (2004a); Sehmel (2002a); Spencer (2002); van Der Geest and Spyridakis (2000); Walch (1999) and Winn and Beck (2002) who argued that the design feature of the Internet exists and varies in almost all websites. Almost all ENGOMs had well designed websites which had been effectively structured to support SD in Malaysia.

The result reflects that the MNS site was well designed where the speed of homepage was efficient and the homepage and other pages were attractive with strong eye appeal whereby the colours used were soothing, pleasant and not straining the eye. The fonts used in the MNS site were clear and there was moderate use of multimedia (graphics only) and the site was equally effective with a variety of browsers such as the Internet Explorer and Mozzilla Firefox. The content presentation was good and MNS had quite current information on its site, and the availability of further information was good. The results indicate that MNS site was well designed and well structured. MNS site was able to effectively support the SD when nineteen out of twenty-four (79%) design features of good web design were present on its site.

WWFM site on the other hand was classified as moderately well designed. The speed of its homepage was efficient, and the homepage and other pages were moderately attractive, whereby the colour concept for the website was quite contrasting and it gave an impression of an old fashion design. The fonts used on WWFM site were clear with a readable font size, clear and precise too. The homepage was also moderately attractive

as it had too long scrolling which should be avoided. The navigation ease of use was moderate and there was a moderate use of multimedia on WWFM site as it only provided graphics. Nevertheless, the browser compatibility is effective as tested with a variety of browsers such as the Internet Explorer and Mozzilla Firefox. WWFM site content presentation was moderate too and some of the information was not current. However, the availability of further results that the WWFM site was moderately well designed as thirteen out twenty four (54%) design features of good web design were present on its site. Therefore it could be said that the WWFM site design was moderately structured in supporting the SD in Malaysia. Therefore, to be more effective in supporting SD, WWFM site design needs improvement such as it would be able to conduct online campaigns and encourage dialogues. Outdated contents from the latest information section needs removal. WWFM needs an experienced web designer.

SAM site was poorly designed. However, the speed of homepage was good, but the homepage and other pages were not attractive as the overall design of the site was not well-developed. SAM site did not organise the layout features such as frames and embedded pictures. The fonts used, however, were clear and the site had no background colour. There were no elements of multimedia used on SAM site; even graphics were hardly available. The analysis on SAM site indicated that ninety percent of its contents were presented as texts and this was quite boring. The overall navigation of SAM site was not easy to use and the use of multimedia was not relevant. The browser compatibility was moderately effective as tested with the Internet Explorer and Mozzilla Firefox. The content presentation was not good as a lot of information placed on the site was not current. However, the availability of further information was good. The results revealed that SAM site was poorly designed when only seven out of twenty four (29%) design features of good web design were present on its site. Therefore SAM site was poorly designed and this could not effectively support SD in Malaysia. SAM site needs a lot of attention and revamping to meet the standard of first class websites to enable it to conduct campaigns and to encourage dialogues effectively.

On the other hand the findings reflected that ENSEARCH site was well designed and well structured to help the organisation to conduct campaigns and encourage dialogues. The speed of its homepage was efficient, the homepage was attractive, as at a glance it was soothing to the eye, not cluttered and was given an "environmental website" feeling when visitors first looked at it. The site was well- organised, as ENSEARCH was often labeled as a "brown" group, the entire ENSEARCH website, which was in the three brown tones was soothing to the eye. The navigation links were easy to use and the site also had used relevant graphics as multimedia feature. The browser compatibility was effective as tested with a variety of browsers such as the Internet Explorer and Mozzilla Firefox. Even though the content presentation was good, but the information was not that current and the availability of further information is moderately available. The results indicated that ENSEARCH site was well -designed and well structured. This enabled the organisation to effectively communicate environmental issues online to support SD in Malaysia when seventeen out of twenty-four (71%) design features of good web design were present on its site.

CETDEM site was also reflected as a well designed website and this could help the organisation to support the SD in Malaysia effectively. The speed of the homepage was efficient, and the homepage and other pages were attractive whereby the presentation in terms of the 'look', and how the documents in the site were structured is simple and clearly visualised. The fonts used were very clear, and the colour used was cool and the overall site presentation was appealing and soothing to the eye. The navigation of

CETDEM site was easy to use as it was structured in simple 'level' form where it made easy for navigation. There was a moderate use of graphics as basic multimedia feature used on CETDEM site. The browser compatibility was effective as it was tested with the Internet Explorer and Mozzilla Firefox. The content presentation and the availability of further information were good. However, a lot of information provided on its site was not current. The results in indicated that CETDEM site was well designed and well structured. CETDEM had sixteen out of twenty-four (67%) design features to make a good, well designed site.

ENGOMs need to continuously give attention to their web design. For instance they need to improve their websites, they need to segment the old or irrelevant information to other sections, or in fact eliminate it totally. They also need to balance the text with the visuals, overcome the broken links, etc. as suggested by Scharl (2004a). Since the findings proved that the ENGOMs were using the websites to conduct campaigns and to encourage dialogues, ENGOMs therefore need to look at their overall web design elements as the persuasive power, as environmental websites focused more into visuals and navigation elements as argued by Winn and Beck (2002). However, some ENGOMs need to improve their websites by removing the old and irrelevant information, removing the broken links, etc. Overall, the ENGOM websites were well designed.

Nielsen (2000, 2004) stressed that the web design must be effectively presented on the websites to allow people to access the content. He also stressed that poor websites affect people to find information on the sites. The findings reflected that ENGOMs, namely MNS, ENSEARCH and CETDEM had put in big effort in designing their websites. The findings showed that MNS site, ENSEARCH site and CETDEM site had paid attention to the attractiveness of the sites such as the content presentation, choice of fonts, colours, graphics, etc. as suggested by Lynch and Horton (1999; 2002), Nielsen (2000), and Scharl (2004a).

CONCLUSION AND SUGGESTIONS

This paper explored how the design of ENGOM websites attributed to the EC in supporting the SD in Malaysia. The website content analysis was conducted fully online. This research investigated what ENGOMs are doing with their websites and this contributes to accessible, data-based insight into Web design for an environmental advocacy group; and this can help the groups in particular and other Web designers, as well, to know more about what processes they may be using (or not using) to build and to maintain their sites, what characteristics their sites may have, and how audiences might perceive their sites.

The ENGOM websites which are relatively new make use of the second generation design and layout features including frames, embedded pictures, clear fonts and styles, sufficient graphics, no background colors , as it is clear white background. All pages, home page, and the other linked pages and layers (until fourth layer) incorporate color, and graphic elements while deciding on the placement and the arrangement of materials. It is quite pleasant as the site is not overly saturated with facts and figures or pictures, or photographs. As Sehmel (2002a; 2002b) emphasizes about micro design, MNS, similarly, can brand, build community, and portray other features to assure and convince the visitors of the quality of the group and its effectiveness in helping the environment.

In conclusion, if the ENGOMs want to successfully utilise their websites to communicate environmental issues and support SD in Malaysia, they need to: i) have better source of information about web design than their experiences with other websites; ii) best have full time web designer or web master or at least for web professionals who are working part time for the organisations to have better access to web design; iii) know how to make the most of their collaboration (if they do collaborate), which expertise to obtain and from whom, what resources to expend on usability, audience, and campaign evaluation research.

By analysing the content of MNS' website in detail, this research provides a model for evaluating web content beyond the normal usability or functionality. Other groups in Malaysia specifically and other parts of the world generally, may consider website layout more seriously, such as whether the site uses its visual elements and placement on the site to emphasise the information and other contents on the site of most importance and interest to its designer and its audiences, and whether the site builds action among community in supporting SD.

This study also helps us understand the following about the environmental advocacy groups that their websites may not currently be providing the variety of perspectives they would need to provide to support SD.

CONTRIBUTION AND IMPLICATION

Findings from the five cases studied in this research, while not generalisable to other websites, have certainly provided information about what is likely to be applicable in the websites for the use of the environmental advocacy groups in general, be it in Malaysia or in other parts of the world. The findings also represent the subjective experience and also the objective experience of the environmental websites. The web design category identified in this study may be the first step towards an empirical, multidimensional definition of environmental website quality. This study can help environmental organisations, such as ENGOMs, in particular, and other web developers or designers in general to know what processes, categories and characteristics of environmental websites may possess, and how their audience may perceive their sites, as this research provides very clear and to-the-point accessible data and insight for environmental organisations to explore in building and developing their websites.

This study also suggests that ICT engineers, web designers, computer architects, etc., need to come up with a technical support plan, such as creating artificial agents to help the environmental websites – perhaps to create innovation in some new systems or programmes such as the aid of an electronic agent to support environmental crisis. Another solution would be embedding software robots in the environmental web pages. They could assist users in managing communication during an environmental crisis, in order to retrieve correct and accurate information about any disasters that may occur.

It is suggested that research on users of environmental websites be conducted. The best solution to evaluate the effectiveness of an environmental website is probably to conduct a test to look at the users' point of view about environmental groups' websites, and this study could potentially be integrated with the heuristic study of the environmental websites. Future studies that incorporate more discriminating means of measuring the usability of the websites in communicating and supporting the environmental advocacy groups' missions and goals are also necessary. By doing so,

we could see the relationship between the results gathered by both methods, i.e. results gathered by lay-people such as the researcher, and results gathered by many users from various backgrounds. Therefore a web usability test should be done in order to know what problems are faced by them when using the websites. This research can also determine the environmental interest among the site's audience, and intended demographic. The question of how users perceive the content on the site – whether it is valuable, trustworthy, high quality, etc. or how they experience the navigation of the sites and the interactivity part of the sites – may allow us to further see the usability of the sites and the effectiveness in communicating the groups' missions and goals. Conducting usability tests involving all potential site users would help to improve the navigability of websites and their overall effectiveness. The results of this test may also suggest that the Internet is particularly appropriate for environmental purposes, as people who are likely to be involved in environmental action are also likely to have access to environmental websites. But this pattern may have the potential of reinforcing tendencies for environmentalism to be viewed as something for the well-offs in developed countries, rather than for undeveloped countries, as developed countries tend to provide greater Internet access and facilities. It is hoped that the key themes identified in this thesis can be utilised to shape future audience-oriented research.

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