Faculty of Commerce - Papers (Archive)   Faculty of Business

2009

Opportunities for interactivity in public health websites: a content analysis approach

Sumayya Banna
University of Wollongong, sb917@uow.edu.au

Helen M. Hasan
University of Wollongong, hasan@uow.edu.au

Joseph A. Meloche
University of Wollongong, jmeloche@uow.edu.au

Opportunities for interactivity in public health websites: a content analysis approach

Abstract

The Internet has many advantages over other media in the provision of information services in the area of public health. However many designers are not yet taking full advantage of its potential for interactivity. This paper examines the development of interactivity in public health websites in the increasingly important area of Palliative Care. Content analysis is used here to map the interactivity in a sample of 30 existing websites along with Heeter's six dimensions (content and availability of choice, effort users must exert, responsiveness to the users, and the ease of adding information, monitoring the information and the system use, and facilitation of interpersonal communication). The results of this study show that the effort users must currently exert in finding information .The presence of content as well as the availability of choice are the most prevalent options currently found in these websites. However, the overall level of opportunities for interactivity was low. This suggests that online palliative care sites are not as interactive as they could be. Designers are not yet taking full advantage of the range of opportunities that the Internet offers to promote health and the benefits that would come from using interactive tools for more active communication.

OPPORTUNITIES FOR INTERACTIVITY IN PUBLIC HEALTH WEBSITES: A CONTENT ANALYSIS APPROACH

Sumayya Banna, School of Management and Marketing, University of Wollongong, Australia   sb917@uow.edu.au

Helen Hasan, School of Economics, University of Wollongong, Australia   hasan@uow.edu.au

Joseph Meloche, School of Management and Marketing, University of Wollongong, Australia   jmeloche@uow.edu.au

Abstract

The Internet has many advantages over other media in the provision of information services in the area of public health. However many designers are not yet taking full advantage of its potential for interactivity. This paper examines the development of interactivity in public health websites in the increasingly important area of Palliative Care. Content analysis is used here to map the interactivity in a sample of 30 existing websites along with Heeter's six dimensions (content and availability of choice, effort users must exert, responsiveness to the users, and the ease of adding information, monitoring the information and the system use, and facilitation of interpersonal communication).

The results of this study show that the effort users must currently exert in finding information .The presence of content as well as the availability of choice are the most prevalent options currently found in these websites. However, the overall level of opportunities for interactivity was low. This suggests that online palliative care sites are not as interactive as they could be. Designers are not yet taking full advantage of the range of opportunities that the Internet offers to promote health and the benefits that would come from using interactive tools for more active communication.

Keywords: Interactivity, Website Content Analysis, Palliative Care.

1   INTRODUCTION

The Internet has become increasingly popular as a means to transform personal and public health, as it an ideal medium to disseminate information and provide education (Escoffery et al, 2005). This phenomenon of new media dissemination is part of an emerging area in health informatics and e-health. The many advantages of the Internet over other media include its ability to provide access to a wealth of information to a wider population without additional cost, at anytime, while maintaining privacy and anonymity (Shephard, 2002). In addition, the Internet offers many sources of information on a huge variety of up-to-date topics and delivers that information quickly and flexibly. Governments, non-profit organizations, and private/commercial actors around the world have begun to take advantage of the Internet's ability to communicate with large numbers of people, and have established a variety of health-related websites.

The research described in this paper looks at Palliative Care, as it is an important instance of health informatics. Palliative Care is a comprehensive, interdisciplinary form of care designed to promote quality of life for patients and families facing the problem associated with life-threatening, serious or incurable illness. Palliative Care aims to prevent and relieve the suffering of terminally ill patients by means of early identification and quality treatment of pain and many other problems that they face. These problems can be physical, psychosocial and spiritual. Stakeholders in Palliative Care include the patients, their carers, friends and family as well as the clinicians.

Information and communication technology (ICT) is bringing changes to the health care industry. Increasingly Internet technology now provides opportunities for making the communication between health care professionals and other stakeholders more meaningful and interactive. The research described here uses content analysis to analyse interactivity in a broad range of existing palliative care websites. Interactivity has been identified as one of the characteristics of the new media being provided via the World Wide Web (WWW) although researchers do not always agree on one standard definition of what interactivity is. This study builds on the approach of Heeter (1989, 2000) to conceptualize the dimensions and options of interactivity to explore the interactivity of palliative care websites across the world. The objective of this study is to investigate the level of interactivity provided by existing online palliative care websites and analyse them in order to assess the impact of the Internet on public health information and to inform future directions in this area.

This paper describes the conduct and findings of this study and is organised as follows. The next section presents a comprehensive compilation of numerous studies related to interactivity concepts and Heeter's six dimensions (Heeter 1989, 2000). This is followed by a section that describes the methodology used in this study, the data sources and analysis. Then the findings generated from the analysed websites are presented along with a discussion that highlights the major similarities and differences among the websites. Lastly, we conclude with some recommendations and suggestions for future application and research.

2   DIMENSIONS OF INTERACTIVITY

Content analysis is recognized as research technique that is used in various fields, for instance, in marketing, communication, social sciences and psychology. With the introduction of Web-based information, content analysis has become a significant research method (Neuendorf, 2002). Yet content Analysis has a long established history and as early as 1952 Berelson, suggested five main purposes of content analysis: to describe substance characteristics of message content, describe form of characteristics of message content, make inferences to producers of the content, make inferences to audiences of content, and predict the effects of content on audiences (Berelson 1952). In general, content analysis has four key advantages or strengths: firstly, it is has the attractive feature of being unobtrusive, secondly, it can handle unstructured matter (or being flexible), thirdly, it is context sensitive, and therefore can process symbolic data; and fourthly, it is useful in dealing and coping with large volumes of data (Krippendorf, 2004). These advantages allow researchers to investigate and examine the content of information by combining the characteristics of the World Wide Web, which are ubiquity, volatility (instability), globalization, and interactivity (Weare & Lin, 2000). The last strength (interactivity) is especially suited to the WWW as new information grows exponentially in the WWW. Even though content analysis is one of the most popular research methods to study the WWW, few studies focused on how researchers applied the principle of traditional content analysis into the dynamic environment of the WWW. Research with some or all those purposes can add value to understanding the evolving communication environment of the WWW. As such, website content analysis has potential for supporting research, but there is still limited research in this area (Adam & Deans, 1999; Palmer & Griffith, 1998; Sheehan & Doherty, 2001).

Some researchers have studied content analysis of websites in order to measure their interactive features (Ha and James, 1998). However, a standard definition of the concept of interactivity does not exist yet. Defining interactivity is mainly an issue because it is still relatively new concept and it is a valid way of thinking for communication studies. Before the advent of the web, interactivity was largely assumed an attribute of interpersonal communication (Morris & Ogan, 1996). With the rapid rise of the web as a commercial media, interactivity appeared as a unique attribute that distinguished the web from other traditional media. To study interactivity in online health media, a functional analysis of the web pages can be conducted in line with Heeter's observation that interactivity resides in the features of a communication medium (Heeter,1989).

An extensive body of literature exists about interactivity in Human-computer interaction (HCI) focuses on improving the interface of computer hardware and software. Jensen (1998) suggested that researchers in the field of HCI have identified the style of control that exists between the human and the computer as the key determinant of interactivity. Interactivity is a crucial concept in computer-mediated environments because it is seen as the central or the key advantage of the medium (Fortin & Dholakia 2000, Rafaeli & Sudweeks, 1997, Williams, Rice & Rogers, 1988). Some researchers believe that the interactive nature or the function of the web (the ability of web users to transmit and receive messages) has created a new communication media compared with the traditional static media model of one-to-many communication; the web is a "many-to-many" channel of communication (Hoffman & Novak, 1996, Rust & Oliver 1994).

Some studies clearly focus on defining interactivity as a continuum (Fortin, 1997). The concept of interactivity and interactive media is mostly used to characterise features of new media that differ from the more traditional media. Jensen (1999) presents a useful review of the different definitions communication scholars have given to interactivity. While many, including Jensen, agree that we do not know which medium will prevail in the realm of interactive programming, Jensen asserts that viewers' interaction in interactive television is "a decisive aspect of the program and a factor for its completion" (Jensen, 1998, p. 16). This shows that interactivity should be understood as a fundamental aspect of communication content and not just as an additional function of communication technology.

There are three fundamental ways of defining concept: as a prototype, as criterion and as a continuum (Jensen, 1998). For instance, based on Durlak's (1987) concept of interactivity presented in Jensen, , which states that face-to-face communication is the ideal type of interactive communication, as it fits into the definition of interactivity as a prototype. "Interactive media systems include the telephone; 'two-way television'; audio conferencing systems; computers used for communication; electronic mail; videotext; and a variety of technologies that are used to exchange information in the form of still images, line drawings, and data (Durlak in Jensen,1998,p.191). Such Durlak's definition offers little information and is of limited use because they do not point out which traits or features of a given media qualify it as interactive (Jensen, 1999, p.39). The examples of interactive media and the media that usually used for interpersonal communication and conversations, such as, email and telephone do not fit the existing definitions of interpersonal media that consider face-to-face communication an ideal type of interactive communication (Jensen, 1998). Heeter's definition of interactivity would fit in what Jensen called the continuum approach. Other multidimensional, continuum-based definitions of interactivity include the classifications of Szuprowicz, Laurel, and Goertz. Szuprowicz (1995) that characterize interactivity as depending on the type of information flow: user-to document (choice of information and time of access), user-to-computer (manipulation of material), or user-to-user (collaborative transaction). Laurel (1990) also identified three variables in interactivity: frequency (i.e. how often can the user interact), range (i.e. amount of choice), and significance (i.e. impact of choice). Finally, Goertz (1995) distinguished four dimensions of interactivity: Degree of choice available, degree of modifiability, quantitative number of the selections and modifications available, and degree of linearity or non-linearity.

This study will adapt their pioneering work which is most worthy of consideration when studying interactivity via websites using content analysis. Heeter (1989) identifies and supplies six-dimensional definitions of interactivity, which includes the following (Heeter, in Jensen, 1998):

1) **Selectivity or complexity of choice:** This dimension, Heeter notes, refers to what Rice (1984) called "amount of choice available to the user." It can also be related to the notion of selectivity, defined as "the extent to which users are provided with a choice of available information" (Heeter, 1989, p.222). According to Kenny et al (2000), complexity of the choice is higher when user has more choices to navigate through the site, and have more hyperlinks on the website, and are able to choose to use a text or graphics browser, and receive information either in English language or another language, or utilise a search engine to locate the information the user want.

2) **The amount of effort that users must exert to access information.** The second dimension has to do with the "amount of effort a user of a media system must exert to access information" (Heeter, 1989, p. 222). This refers to Paisley's idea (1983) that interactivity can be viewed as "the ratio of user activity to system activity" (in Kenny, Gorelik and Mwangi, 2000, p.5). Within this dimension, VCRs are more interactive than broadcast media because users have to go to the store or tape the desired program instead of merely switching channels. It is interesting to note, though, that according to this definition, both VCRs and broadcast media are considered interactive. However, there are two opposing views of the way in which this dimension is understood. On the one hand, the users exert minimal or no effort beyond the reading of text/information that are pushed to them by the site. On the other hand, users select through the use of navigational tools. This can be actually a complex thing to measure. According to Kenny et al (2000), this dimension is concerned with the effort users must exert and thus is all about how easy or difficult it is to find information on particular site and to measure it based on how many clicks it takes to find specific information. Therefore, the more clicks it takes to find information, the more difficult it is assumed to find information and as a result, the more effort that must be exerted by users which in turn makes the site less interactive in this regard and vice versa. On the other hand, McMillan (1998) defines this dimension by how many tools are provided on a site to help the user navigate the site. This dimension is, therefore measured based on the number of predetermined list of navigational tools that exist at the site. The more navigational tools at particular site, the less effort the user must exert in finding information, and therefore, the lower interactivity of that site and vice versa. This is because the availability of navigational tools makes the novice user more comfortable in using the site and therefore, reducing the number of choice the user can make. This study will utilize the measurements of interactivity as defined by McMillan (1998) because the more involved the users involve in the process of seeking information on a particular site, the higher level of interactivity within that process.

3) **Responsiveness to the user:** the third dimension concerns the responsiveness to the user, that is, "the degree to which a medium can react responsively to a user" (Heeter, 1989: 223). This definition integrates Rafaeli's (1985) definition of interactivity as "how responsive is a medium to a user." Within this dimension, a high level of interactivity is achieved when the roles are interchangeable (e.g. between end users or between the source and the receiver). According to Kenny et al (2000), this dimension is reflected on site when they introduce a human or use technology to respond to user queries.

4) **Monitoring of information use:** this Heeter's fourth dimension of interactivity considers the potential of a system to track users as described by Jensen (1998) as form of feedback that automatically and constantly register all user behaviour while on the media system. The use of monitoring device on the site, which site operator/webmaster can record who has visited the site and or/ which part of the site they visited (Kenny et al 2000). Although the measures of monitoring information and system use are relatively simple measures of monitoring, they are however functional as indicators of the level of attention site creators are paying to the audience and the content of the site.

5) **The ease of adding information by user** to the system that a mass and undifferentiated audience can access. "The degree to which users can add information that a mass, undifferentiated audience can access" (Heeter, 1989, p. 224) is the fifth dimension of interactivity. Some websites (i.e. online newspapers) allow users to add web pages, hobby or special interest pages, announcements of births, marriages, death, and reviews of games, movies, and other entertainment events; some websites allow users to add stories about their illnesses (Kenny et al 2000).

6) **Facilitation of interpersonal communication:** the degree to which a media system facilitates interpersonal communication between specific users. Facilitation of interpersonal communication (e.g. email) constitutes Heeter's sixth dimension of interactivity. According to Kenny et al (2000), the presence of interactive options such as chat rooms, discussion groups, bulletin boards, feedback mechanisms, emails, and full motion video displayed on the home page facilitate the

communication between users and site providers and attract more users to the site, and therefore, facilitate interpersonal communication.

7) **Other/unexpected interactive options:** this category accounts for other or unexpected interactive options.

Based on Heeter's theoretical construct, interactivity is regarded as flow of information from two (more) directions. Four of Heeter's dimensions stress the role of the user by empowering the user. Consequently, this empowerment is what clearly distinguishes interactive media from traditional mass media. According to Kenny et al (2000), the dimension concerned with the potential to monitor the system use and empower the sender of the messages within the context of online media as well as the dimension that is concerned with the facilitation of interpersonal communication marks both the sender and the user equally.

The selectivity or the complexity of choice dimension and user control dimension (first and the second dimensions) fall within the consultation pattern of communication. The responsiveness and monitoring of the information use (third and the fourth dimensions) fall within registration pattern. The fifth and sixth dimensions fall into conversation pattern. Such interactivity construct allow for much more advanced and finer classification of interactive media (Jensen, 1998).

The research question asked in this study was, "what is the range of interactive features offered on palliative care websites"? This question was answered through content analysis, and the observation of interactive options and tools offered on the websites.

3   METHODOLOGY

This research aims to study interactivity in websites designed to provide information and support, in areas of public health. The unit analysis in this study is the palliative care or hospice organization website. Palliative Care was chosen as it provides a meaningful context in which to undertake such a comprehensive study of e-health, as it has a wide range of stakeholders and content, as there are differences in the palliative care needs of patients. For example, patients with chronic illness typically experience issues with physical and psychological well being, employment, hobbies, friends, and self-esteem at earlier stage than those unexpectedly diagnosed with cancer. Thus, after decades of progressive health deterioration in their health, individuals with chronic illness often reach terminal phase of their life without many physical and social resources. This is a problem because of the lack of diagnostic certainty, which is more predictable in cancer, can be the handle by which professional healthcare teams can mobilise the additional healthcare resources required to meet patients' palliative and supportive care needs (Fitzsimons et al, 2007). However, Palliative Care, due to its recent emergence as a discipline, health informatics has played only a minor role to date (Kuziemsky et al, 2006). Since the overall life expectancy is increasing with more and more people living beyond 65 years of age, there is an increasing demand and needs towards an effective delivery of Palliative Care and more options to enable people to take more control in the course of their health. In addition, coming to the end of life event triggers the intensive needs for effective communication of health information.

Content analysis was selected to assess the websites commonalities and differences. The first step taken in developing this as the methodology was to decide on the sample. In total, the sample size consisted of 2 governments, 27 non-profit, and 1 commercial websites across 12 countries of the world (Australia, USA, UK, NZ, Canada, Japan, Singapore, India, Russia, South Africa, and Malaysia). The 30   worldwide   sites   accessed   from   international   directory   available   at http://www.helpthehospices.org.uk/about-hospice-care/international/find-an-overseas-service/.   The selection criteria for inclusion in this study required, that the website be 1) written in English language or any other language that the researchers are familiar with, 2) non-topic specific meaning that the website should offer general health information and not to focus on certain group of patients or diseases.

The context unit used for this study is the website, which is defined as a "hierarchy of information, connected via hyperlinks to an infinite number of other sites" (Okazaki & Rivas, 2002, p. 383). Palliative care and/or hospice organizations' websites were chosen for analysis in order to examine their benefits and suggest ways to improve them. They provide a number of benefits, such as detailed information for information-seeking consumers. This intensive and rich information source encourages repeat visits due to its effectiveness in meeting the needs of information seekers. The websites can also serve various communication and social channels and functions (Cho & Cheon, 2005).

Considering the magnitude and changing nature of websites, some creativity would seem to be needed in defining the unit of analysis, and then careful and consistent manipulation and consideration are required to overcome some of the complexities in conducting web content analysis. Ha and James (1998) point out that websites vary in their importance in terms of their size and the amount of information they contains, some have only the homepage and others include considerable information. McMillan (2000) finds that many website studies only code the front page. However, he believes that coding the entire website was crucial in order to get the clearest picture of how it is being used by organizations to communicate effectively with its consumers and whether these organizations are utilizing the websites to its maximum potential.

This study does not limit itself to the homepage because the content of the homepage was too limited and did not necessarily reflect the breadth and scope of content available on a given website, the entire website was coded, including all links and pages associated with that particular website without going beyond the main address. In addition, this method of drilling down from the homepage as well as all pages has been used in previous studies to obtain one of the most comprehensive overviews of the website (Chan-Olmsted & Park, 2000) and to overcome poor usability. To begin, the coder set and saved 30 web addresses (for example, http://www.caresearch.com.au) was saved in the computer by adding it to the favourite as a default page to standardise and ease the process of coding. Only one coder was involved so the issue of reliability among coders is not presented. Difficulty arises from ever-evolving characteristics of the websites, which is an obstacle when searching for a perfect list of sampling frame which makes it difficult to develop samples of inspection, as updating is inherent in web-based media. In short, the websites vary significantly in terms of size, content, structure, as well as their evolving nature, in that new websites are created daily, and others disappear, or the content changes. For this study, the websites were saved in September 2008, and the coding was completed from September through December 2008. Each website was entered through homepage then navigated through for a proximately 30 minutes. Pages were, therefore explored in a more detailed fashion, within a given time limit.

4   CONSTRUCTING MEASURABLE CATEGORIES OF ANALYSIS

In the study presented in this paper the selection of chosen palliative care websites were evaluated and analysed by the presence or the absence of certain criteria in interactive features, based on Heeter's six interactivity dimensions. The reasons for the use of Heeter's (1989) six dimensions of interactivity are that her dimensions are specific and measurable, encompass all new media, and concerned with both/all sides of a two or more directional flow of information (Kenny et al, 2000). In addition, many researches have adopted Heeter's study for the same reason (Ha and James, 1998; Jensen, 1998; McMillan, 1999; Massey & Levy, 1999; Massey, 2000; Dholakia et al, 2000; Downes and McMillan, 2000; Kenny et al, 2000; Paul, 2001; Leung, Chan, and Wu, 2002; McMillan and Hwang, 2002; Gustavsen & Tilley, 2003; Chou, 2003; Chen & Yen, 2004; Rahman, 2008; and others). These researchers have further enriched the concept of interactivity by applying it in various studies involving the internet, graphic audio and video technologies within different disciplines and fields including, marketing, information systems, journalism, computer-mediated communication (CMC), advertising, education, public relations and broadcasting and electronic media. Some of Heeter's original categories have been modified to include more current interactivity tools to reflect the ever-evolving technologies applied. These major features were measured:

- **Selectivity or complexity of choice**- language choice, search engines, links from the first page of the site, links within sites, hyperlinks, text option, Audio/video/podcast/photo gallery, news, print option, and taking into account users' browsers and connection speeds.
- **The amount of effort that users must exert to access information-** a menu bar on the first page of the site that provides a brief description of the sections of the site and has links to primary sections of the site. A menu bar on subsequent pages' and the presence of a hot link that takes the visitor directly back to the home page.
- **Responsiveness to the user-**help page, about us, programmed instructions, informative error messages, means of contacting the Webmaster, the response rate and nature to such queries and 'feedback form' for eliciting input from the user.
- **Monitoring of information use-** cookies, counters (display the number of visitors to a site); visitor registration, and a message indicating when content was updated.
- **The ease of adding information by user to the system that a mass and undifferentiated audience can access-** public bulletin board for posting messages, FAQ/FRAQ and any other means for users to add information to the site.
- **Facilitation of interpersonal communication-** chat rooms, discussion groups, bulletin boards, feedback mechanisms, emails, and full motion video.
- **Other/unexpected interactive options:** this category accounts for other or unexpected interactive options.

Rogers (1998) describes interactivity: as "the capability of new communication systems (usually containing a computer as one component) to 'talk back' to the user, almost like an individual participating in a face-to face or relatively similar type of conversation. Interactivity can be seen as a variable; some communication technologies are relatively low in their degree of interactivity (for example, network television), while others (such as computer bulletin boards) are more highly interactive (Rogers, in Jensen, 1998, p.192). Based on this definition, interactivity is viewed from the context of communication within a basic model of human-computer interaction and related to context of interpersonal communication. Such a definition allows various communication technologies to be placed on a continuum from 'low' to 'high' depending on their degree of interactivity.

In the line with Heeter's (1989) argument that interactivity is not just a matter of "either you have it or you don't"**,** Rogers (1998) defines interactivity as a continuum. A sliding score is allocated for levels of criteria compliance rather than simply ticking yes or no for each criterion measured based on the number of features appeals. A full or partial score is given for the websites based on how far each Heeter's dimension is fulfilled. The chosen websites therefore were ranked on the interactivity scale based on Heeter's six dimensions.

5   RESULTS AND DISCUSSION

The list of websites assessed in line with the process described above is displayed in Tables 1 and 2 in the Appendix as are the quantitative results of that assessment. These results are now discussed.

Content availability and choice: the availability of content and wide variety of choices is significantly prevalent in online palliative/hospice care world wide with 26 occurrences or 86 percent presented. Every sites studied provides various types of content. Hypertextuality, that includes internal and external hyperlink, is found in all palliative care websites. Palliative care websites are clearly improving in providing news links. Almost 90 percent of all availability of content and choices are found in only one government website of Australia (caresearch) and one non-profit website of USA (hospicedirectory). Almost half or fifty percent of the analysed sites empowered with a search engine. Around 23 percent of the sites offer language option. This found in one Australian government site (caresearch) and six non-profit sites around the world: two in USA (hospicedirectory, hopsicecare), one in Canada (chpca), one in Japan (jspm), one in Italy (anteahospice), and one in Russia (hospice.ru). The small number of analysed sites providing the language option is because offering health information in any language carries a certain degree of risk in terms of accurate and reliable

health information. Providing a language option is a difficult service to provide due to variety of reasons: firstly, locating trustworthy health information in other language is difficult. Secondly, it is difficult to assess the accuracy of the information found if no one is found to speak the language and confirm its accuracy. Finally, the amount of risk varies depend on the nature of information or the topic. For example, if the topic is about clinical information regarding a specific drug, diseases conditions and treatment, providing inaccurate information carries potentially more severe damage than if the information is supplied discusses a relatively harmless topic such as exercise (Petch, 2004). For these reasons, governments around the world should be extremely careful in taking extra measure when providing the language option in order to ensure that the clinical information is medically sound, accurate, and complete, and to strengthen the relationship with their public.

Nearly 20 percent of the sites offered a print option and multimedia, which consists of audio/video/podcast/photo. The reason for the scarcity of multimedia tools can be technological factor where limited bandwidth makes innovative multimedia content more difficult (Dueze, 2001). Another reason concerning the scarcity of multimedia appears on the organizational and institutional level of online media regarding media competition and copyright concerns (Pavlik, 2001). Only 17 percent of the online palliative care sites provides text only option.

Effort users must exert: it is found that this particular dimension is the most significant element of interactive features among palliative care websites worldwide (see Table1) with 30 occurrences or 100 percent of the websites perfectly fulfilled this measuring dimension. Most of the information was retrieved only with a single click. Finding different types of information or contents as easier as the sites provide an index on the homepage or categorise contents into pages or categories to enable users to find information quickly and easily. These websites are specifically designed to reduce users' effort in finding information and content. This is in line with findings of McMillan (1998), Heeter (1989, 2000), Dholakia et al (2000), and Deuze (2003).

Responsiveness to the users: in this dimension of interactivity, all palliative care websites prove their responsiveness by providing 'about us' link and 'contact us' link. Almost 57 percent provide feedback forms whereas only very few (nearly 3 percent) provide help options/messages for the users. Only one non-profit website of USA (hospicecare) was ahead of the others in providing help option, 'about us, 'contact us', and feedback form.

Monitoring Information/System Use: this layer of interactivity is less significantly prevalent in online palliative/hospice care world wide with 2 occurrences or 7 percent presented. This interactive dimension is found in only one government website of Australia (caresearch) and one non-profit website in Italy (eapcnet). Online palliative care sites are not rigorous in keeping a record of the number of viewers visiting their sites. None use cookies or counters for this purpose. In general, 70 percent of the analysed sites require visitor registration and/or membership. The dimension of interactivity that proves interactivity utilizing internet technology is immediate uploading or updating information. Only 7 percent of the analysed sites provides message of last updating date. This feature is found in only one government website of Australia (caresearch) and one non-profit website in Italy (eapcnet).

Ease of adding information: the world audiences of online palliative care sites are not empowered to add their personal webpage, hobby page, announcement, or blog. Only one non-profit web-based palliative care in USA (hospicedirectory) allows users to both post questions and add to the blog.

Facilitation of interpersonal communication: online palliative care sites worldwide are not well presented with the interactive feature of interpersonal communication. It only constitutes 7 occurrences or 23 percent. The majority (or 93 percent) of the online palliative care sites provide at least one email address. But in other features- online forum/ discussion group, live chat, feedback mechanism- they show a very weak indication for their willingness to engage in communication with their audiences. Only one non-profit website in the USA (hospicedirectory) facilitates the interpersonal communication via feedback mechanism, online forum/ discussion group, email addresses. None of the analysed sites provides live chat.

Interestingly, this study analysed one commercial website (Jspm in Japan), which was found to fulfil only one of Heeter's criteria (effort users must exert) and failed to employ any other interactive tools. This particular finding contradicts the results found in Stout, Villegas and Kim (2001)'s study that commercial (.com) health websites were ahead of governmental health websites in using interactive tools. Furthermore, according to Cho and Cheon (2003), corporate websites from the western countries (the USA) are more likely to use interactive functions and tools than are the websites from others.

In addition to the above six criteria of Heeter, we also investigate other advanced and unexpected features. We found that 86 percent of analysed sites contain other features such as online forms, post or share your story, and make donation. We also found that only three non- profit websites: two in USA (Americanhospice, hospicedirectory), and one in South Africa (hospicedirectory) provide finding palliative care services. Furthermore, the USA (Americanhospice) provides online survey, send e-card, and ask specialist services whereas the USA (hospicedirectory) provides online store to order and buy books, DVDs, and videos. South Africa (hospicedirectory) provides online medical dictionary and ask specialist services.

Comparing the palliative care websites throughout the world, this study found that none of the analysed sites have fulfilled all six Heeter's criteria (see Table 2). However, only one non-profit website, a USA (hospicedirectory) site, ranked the highest in the interaction continuum because it has fulfilled five out of six criteria, and therefore was the most interactive by this particular measure (See Table1). One Australian Government palliative care (caresearch) and five non-profit sites around the world: one Australian site (pallcarevic), one Canadian (hospicebc), one in Italy (eapcnet), one in South Africa (hospicepalliativecaresa), one Indian (palliativecare.in) each fulfilled four criteria. The rest of the analysed sites (80 percent) have fulfilled three criteria only. Overall, the study found that the average interactivity level for these 30 analysed palliative care websites around the world was low.

6   CONCLUSION

The study presented in this paper investigated the extent of interactivity in 30 palliative care websites from 12 countries around the world. The researchers used a website content analysis approach to map out Heeter's six interactivity dimensions, namely: content availability and choice, effort users must exert, responsiveness to the users, monitoring information and system use, ease of adding information, and facilitation of interpersonal communication. These researchers' stressed the importance of easy navigational structures especially at the front page of the websites as demonstrated in this study. The results show that there is an obvious increase in the number of choices and content through category/index/page links to enable users to exert less effort in locating information, apparent improvement in presentation of the content, and their ability to communicate large amount of information. This is a strong indication that health information on the internet is expanding rapidly, and websites are now capable of enhanced functionality.

Options of interpersonal communication, adding information, live chat rooms, and feedback mechanism and discussion forums are significantly absent. One of the great challenges for online palliative care sites are to utilize and incorporate certain interactive technological facilities effectively, and to take full advantage of the Internet's benefits. No single site manages, from those studied, to take advantage of the whole range of opportunities the Internet offers in terms of feedback, customization/personalisation, immediacy of content, multimedia, etc.

Content analysis also shows that only one non-profit website, a USA (hospicedirectory) site, fulfilled five out of six criteria in the interactivity continuum. It ranked the highest on the criteria of low effort users must exert, content availability and choice, ease of adding information, facilitation of the interpersonal communication, and some advance features. One Australian Government Palliative Care (caresearch) has fulfilled four criteria. All the websites analysed contain hyperlinks and some interactive features, and some of them use multimedia more or less, but few of them do it extensively. Our findings clearly indicate that non-profit sites are ahead of the curve using interactive tools while governmental websites may be viewed as being the greatest source of information and content, yet

their sites provide few or no interactive capabilities. Since previous studies stressed the fact that interactive tools of different types vary across websites from various countries of the world, therefore, it would be important and interesting for future work to focus on studying the interactivity and cultural differences on the basis of the user's activities.

Given the demand for e-health media in the world, the opportunities for growth in online health functions are great. Thus to reach a higher level of interactivity, online health websites have to address all the key dimensions that would enhance the websites. This study confirms that creating interactivity features does make a difference in increasing public trust on government websites. In addition, website designers should more seriously consider all features and interactivity tools when creating website design.

This study used content analysis to examine interactivity in healthcare websites using a sample of palliative care sites as representative of the content and features as well as users' interactive behaviour, and their perception of interactivity. The results of this study suggest further work is warranted to examine the opportunities for enhancing interactivity behaviour and the examination of perceptions of interactivity occurring between and among online users employing more extensive survey or experimental techniques would be useful.

Future research should also focus more systematically on understanding how the medium's interactive features can be optimised to enhance the communication objectives of the site. Palliative care websites and public health websites in general offer potential for doing more than providing information to the consumers through increased interactivity. Research is needed to inform practice for the improvement of the interactive capability of the Internet in such sites and thus allowing better health outcomes overall.

References

Love P.E.D and Irani Z. 2003. 'A project management quality cost information system for the construction industry'. *Information and Management,* 40(7): 649-661.

Adam S. and Deans K. (1999). Web Qual: an e-commerce audit. Fifth Australian World Wide Web Conference. Southern Cross University, http://ausweb.scu.au/aw99/papers/adam/paper.html

Berelson B. (1952). Content Analysis. University of Chicago

Chan-Olmsted S. M. and Park J. S. (2000). "From on-air to online world: Examining the content and structures of broadcast TV stations' Web sites." Journal of Mass Communication Quarterly **77**: 321-339.

Chen K. and Yen DC. (2004). "Improving quality of online presence through interactivity." information and management **42**(1): 217

Cho C-H. and Cheon H-J. (2003). "Korean vs. American Corporate Websites: Interactivity, Comparative Appeals and Use of Technology." Journal of Korean Academy of Marketing Science **11**: 79-101.

Cho C.H. and Cheon HJ. (2005). "Cross- Cultural comparison of interactivity on corporate websites: the United States, the United Kingdom, Japan, and South Korea." Journal of Advertising **32**(2): 99-116.

Chou C. (2003). "Interactivity and interactive functions in web-based learning systems: a techniccal framework for designers." British Journal of Educational Technology **34**(3)

Deuze M. (2001). "Online journalism: modelling the first generation of news media on the World Wide Web." First Monday **6**(10): http://firstmonday.org/issues/issues6_10/deuze.html

Deuze M. (2003). "The web and its journalisms: considering the consequences of different types of news media online." new media society **5**(2): 203-30.

Dholakia RR. Zhao M., et al. (2000). "Interactivity and revisits to websites: a Theoretical framework."

Durlak J., Ed. (1987). A Typology for Interactive Media. In Communication Yearbook 10. Newbury Park, Sage Publications

Escoffery C., Miner K., et al. (2005). "Internet use for health information among college students." Journal of American College Health **53**(4): 183-189.

Fisher B. and Britten N. (1993). "Patient access to records: expectations of hospital doctors and experiences of cancer patients." British Journal of General Practice **43**: 52-56.

Fitzsimons D., Mullan D., et al. (2007). "The challenge of patients 'unmet palliative care needs in the final stages of chronic illness." Journal of Palliative Medicine **21**(313)

Fortin D. R. and Dholakia R.R. (2000). "Examining the Effects of Interactivity on Social Presence and Involvement with an Online Advertisement." Journal of Advertising Research **43**(2): 1-13.

Fortin, D. R. (1997). The Impact of Interactivity on Advertising Effectiveness in the New Media. College of Business Administration. Kingston, R.I, University of Rhode Island. unpublished dissertation.

Goertz L. (1995). "Wie interaktiv sind Medien? Auf dem Weg zu einer Definition von Interaktivität. [Howinteractive are media? Towards a definition of interactivity]." Rundfunk und Fernsehen **43**(4): 477-493.

Gustavsen P.A. and Tilley E. (2003). "Public relations communication through corporate websites: towards an understanding of the role of interactivity." Prism **1**(1)

Ha L. and James EL. (1998). "Interactivity re-examined: a baseline analysis of early business websites'." Journal of Broadcasting and Electronic media **42**(4): 457-74.

Heeter C., Ed. (1989). Implication of new interactive technologies for conceptualizing communication. media use in the information age: Emerging pattern of adoption and consumer use. Hillsdale, N.J., Lawrence Erlbaum Associates.

Heeter C. (2000). "Interactivity in the Context of Designed Experiences." Journal of Interactive Advertising, **1**(1): http://www.jiad.org.

Hoffman D. and Novak T. (1996). "Marketing in Hypermedia Computer-Mediated Environments: Conceptual Foundations." Journal of Marketing **60**(3): 50-68.

Jensen J.F. (1998). "Interactivity: tracking a new concept in media and communication studies." Nordicom Review **19**(1): 185-204.

Kenny G., Gorelik A., et al. (2000). "Interactive features of online news paper." First Monday **5**(1): http://www.firstmonday.org/issues5_1/Kenny/index.html.

Krippendorf K. (2004). Content analysis: an introduction to its methodology. Thousand Oaks, CA, Sage publications.

Kuziemsky C., Jahnke J., et al. (2006). "The e-Hospice - Beyond traditional boundaries of palliative care." Telematics and Informatics **23**(2): 117-133.

Laurel B., Ed. (1990). Users and Contexts. In The Art of Human-Computer Interface Design. Reading, MA, Addison-Wesley Publishing Company, Inc., 91-93.

Leung C-H., Chan Y-M., et al. (2002). Importance of interactivity and customization in online learning. paper presented to the proceedings of the International Conference on Computer in Education (ICCE'02), Auckland, New Zealand.

McMillan S. J. (1999). Four Models of Cyber-Interactivity: Individual Perceptions of Interactivity in Computer-Mediated Environments. International Communication Association Annual Conference. San Francisco, CA.

McMillan S.J. (1998). "Who pays for content? Funding in interactive media." Journal of Computer-mediated communication **4**(1)

McMillan S.J., (2002). Exploring models of interactivity from multiple research traditions: users, documents, and systems. The handbook of new media. London, Sage publications

McMillan S.J. and Hwang JS. (2002). "Measures of perceived interactivity: an exploration of the role of direction of communication, user control, and time in shaping perceptions of interactivity." Journal of Advertising **31**(3): 41-54.

Morris M. and Ogan C. (1996). "The Internet as Mass Medium." Journal of Computer Mediated Communication, **1**(4): http://www.ascusc.org/jcmc/vol1/issue4/morris.html

Neuendorf K. (2002). The Content Analysis Guidebook. CA, Sage Publications

Okazaki S. and Rivas J A. (2002). "A content analysis of multinationals' Web communication strategies: cross-cultural research framework and pre-testing." Journal of Internet Research **12**(5): 380-390.

Paisley W. (1983). "Computerizing information: Lessons from a videotex trial." journalism of Communication **33**(1): 153-161.

Palmer J.W. and G. D.A. (1998). "An emerging model of website design for marketing." Communication of the ACM **41**: 45-51.

Paul M. J. (2001). "Interactive disaster communication on the Internet: A content analysis of sixty-four disaster relief home pages." Journalism and Mass Communication Quarterly **78**: 739-753.

Petch T. (2004). Content analysis of selected health information websites: Final Report. Vancouver, Canada, Simon Fraser University.

Rafaeli S. (1988). From New Media to Communication. Merging Mass and Interpersonal Process,R. P. Hawkins, J. M. Wiemann and S. Pingree, eds. I. A. C. Science:. Newbury Park, CA: Sage: 110-134.

Rafaeli S. and Sudweeks F. (1997). "Networked Interactivity." Journal of Computer Mediated Communication **2**(4): http://www.usc.edu/dept/annenberg/vol2/issue4/rafaeli.sudweeks.html

Rahman M. (2008). "Interactive options in online newspaper of Bangladesh." Pakistan Journal of Social Sciences **5**(6): 620-624.

Rice R.E., Ed. (1984). New Media technology: Growth and integration. The new media: Communication, research, and technology, (pp. 33-54). Beverly Hills, CA, Sage.

Rogers E. (1986). "Communication technology " the new media in society **New York**.

Rust R. and Oliver R. (1994). "The Death of Advertising." Journal of Advertising **23**(4): 71-78.

Sheehan K.B. and Doherty C. (2001). "Re-weaving the web: integrating print and online communications." Journal of interactive marketing **15**: 47-59.

Shephard R.J. (2002). "Communicating physical activity and health messages: science into practice." American Journal of Preventative Medicine **23**(3): 221-225.

Stout PA., Villegas J., et al. (2001). "Enhancing learning through use of interactive tools on health-rekated websites." Health Education research theory and Practice **16**(6): 721-733.

Szuprowicz B. (1995). Multimedia networking. New York, McGraw-Hill

Weare C. and Lin W.Y. (2000). "Content analysis of the world wide web-opportunities and challenges." Social Science Review **18**: 272-292.

Williams F., Rice R., et al. (1988). Research Methods and the New Media. The Free Press. New York.

7   APPENDIX

Table 1   Worldwide Palliative/Hospice Care Sites Overall Interactivity

Health Website Name	Complexity of choice (out of 10)	User effort (out of 2)	Responsiveness (out of 5)	Monitoring Information (out of 5)	Adding Information (out of 3)	Interpersonal Communication (out of 4)	Total Dimension (out of 6)	Advanced features
Caresearch (Aus)	9	2	2	2	0	1	4	2
Pallcare (Aus)	6	2	2	1	0	1	3	2
Palliativecarensw (Aus)	5	2	2	1	0	1	3	1
Palliativecarewa (Aus)	5	2	2	1	0	1	3	1
Palliativecare (Aus)	5	2	2	1	0	1	3	1
Pallcarevic (Aus)	5	2	3	1	1	2	4	1
Pcis (Aus)	5	2	3	1	0	1	3	1
Pallcareqld (Aus)	6	2	3	1	0	1	3	2
Helpthehospices (UK)	8	2	3	0	0	1	3	2
Ncpc (UK)	6	2	3	1	0	1	3	1
hospice-foundation (Ireland, UK)	8	2	2	0	1	1	3	2
Hospicecare (USA)	8	2	4	1	0	1	3	2
Hospice (USA)	7	2	3	1	1	1	3	2
Americanhospice (USA)	6	2	3	0	0	3	3	3
Hospicedirectory (USA)	9	2	3	1	2	3	5	3
hospice.nz (NZ)	7	2	2	1	0	1	3	1
ssl.ebits (NZ)	6	2	3	1	0	0	3	1
Nshoispice (NZ)	5	2	3	0	0	1	3	0
Eapcnet (Italy)	5	2	1	2	0	2	4	0
Aphn Singapore)	6	2	3	1	1	1	3	1
Victoricahospice (Canada)	4	2	3	1	0	1	3	1
Chpca(Canada)	6	2	2	0	1	1	3	1
Hospicebc (Canada)	4	2	2	1	1	2	4	1
Hospicepalliativecaresa (South Africa)	4	2	3	0	1	2	4	3
Palliativecare (India)	6	2	3	1	1	2	4	0
Pallimindia(india)	7	2	2	1	0	1	3	2
Jspm (Japan)	4	2	2	0	0	1	3	0
Anteahospice (Italy)	7	2	2	1	0	1	3	1
hospice.ru (Russia)	6	2	3	0	0	1	3	1
Hospicemalaysia (Malaysia)	7	2	3	0	1	0	3	1

Banna et al.

Opportunities for Interactivity in Public Health Websites

Total criteria	26	30	17	2	1	7

Table2   Palliative Care Sites Interactivity: Individual criteria ranked from least to most.

Health website Name	Interactivity Continuum						Degree
	Low		Mod		High		
Pallcare (Australia)	■	■	■				3
Palliativecarensw (Australia)	■	■	■				3
Palliativecarewa (Australia)	■	■	■				3
Palliativecare (Australia)	■	■	■				3
Pcis (Australia)	■	■	■				3
Pallcareqld (Australia)	■	■	■				3
Helpthehospices (UK)	■	■	■				3
Ncpc (UK)	■	■	■				3
Hospicecare (USA)	■	■	■				3
Hospice (USA)	■	■	■				3
hospice.nz (New Zealand)	■	■	■				3
ssl.ebits (New Zealand)	■	■	■				3
Nshoispice (New Zealand)	■	■	■				3
hospice-foundation (UK)	■	■	■				3
Aphn (Singapore)	■	■	■				3
Victoricahospice (Canada)	■	■	■				3
Chpca (Canada)	■	■	■				3
Pallimindia (India)	■	■	■				3
Jspm (Japan)	■	■	■				3
Anteahospice (Italy)	■	■	■				3
hospice.ru (Russia)	■	■	■				3
Hospicemalaysia (Malaysia)	■	■	■				3
Caresearch (Australia)	■	■	■	■			4
Pallcarevic (Australia)	■	■	■	■			4
Eapcnet (Italy)	■	■	■	■			4
Hospicebc (Canada)	■	■	■	■			4
Hospicepalliativecaresa (South Africa)	■	■	■	■			4
Palliativecare.in (India)	■	■	■	■			4
Hospicedirectory (USA)	■	■	■	■	■		5

Banna et al.

Opportunities for Interactivity in Public Health Websites