PROCEEDINGS OF THE 11th ANNUAL CONFERENCE ON WORLD WIDE WEB APPLICATIONS

2-4 September 2009
Port Elizabeth
South Africa

Editor:
P.A. van Brakel

Publisher:
Cape Peninsula University of Technology
PO Box 652
Cape Town
8000

Proceedings published at
http://www.zaw3.co.za

ISBN: 978-0-620-45215-1

TO WHOM IT MAY CONCERN

The full papers were refereed by a double-blind reviewing process according to South Africa's Department of Education (DoE) refereeing standards. Papers were reviewed according to the following criteria:

- Relevancy of the subject to Web applications
- Explanation of the research problem & investigative questions
- Quality of the literature analysis
- Appropriateness of the research method(s)
- Adequacy of the evidence (findings) presented in the paper
- Standardised referencing style.

The following reviewers took part in the process of evaluating the full papers of the 11th Annual Conference on World Wide Web Applications, held from 2 tot 4 September 2009 in Port Elizabeth:

Prof J Brits
Faculty of Information Sciences (Dean)
University of Wisconsin
Milwaukee
USA

Prof T Carr
Centre for Higher Education Development
University of Cape Town
Cape Town

Prof J Cronjé
Faculty of Informatics and Design (Dean)
Cape Peninsula University of Technology
Cape Town

Mr Craig de Beer
Web Management Services
Massey University
Palmerstone
New Zealand

Prof M Erasmus
Management Information Systems
Erasmus Associates
Lynnwood
Pretoria

Dr AM El-Sobky
Educational Sciences
RITSEC
Cairo
Egypt

Dr MWH Labour
Laboratory of the Sciences of Communication
University of Valenciennes and Hainaut Cambrésis
Valenciennes Cedex
France

Prof S Mutula
Department of Information Science
University of Botswana
Botswana

Dr David Raitt
European Space Agency
The Hague
The Netherlands

Prof A Singh
Department of Business Information Systems
University of KwaZulu-Natal
Durban

Prof P Weimann
Economics and Social Sciences
University of Applied Sciences
Berlin
Germany

Further enquiries:

Prof PA van Brakel
Conference Chair: Annual Conference on WWW Applications
Cape Peninsula University of Technology
Cape Town
+27 21 469 1015 (landline)
+27 82 966 0789 (mobile)

A “universal metaphor” for the user interface for an Internet based health support website

J Barnes
Faculty of Informatics and Design
Cape Peninsula University of Technology
South Africa
Email: barnesj@cput.ac.za

Abstract

Face-to-face health support groups have a long established pedigree, dating back to the 1920s and the inception of Alcoholics Anonymous. Since then, support groups have been started for a huge range off illnesses, from the trivial to the chronic, for both sufferers and supporters. However, face-to-face support groups rely on a number of somewhat limiting factors for their continued success, e.g. a dedicated and committed leader, a regular meeting place and time, a minimum number of “core” members attending most meetings etc. These limitations often lead to support groups being short-lived, even in large population areas, and may discourage the formation of support groups entirely.

Online (virtual) support groups solve several of these problems. In particular the issue of everyone having to be in one place at one time is solved, and support groups can now be geographically dispersed. However, members can no longer “see” who they are communicating with, and serious cross-cultural problems can occur, for example the giving of inappropriate spiritual support from a Christian to a Moslem. It is much easier to sense the potential for cultural differences when the people concerned are physically co-located.

All users expect largely the same outcomes from a support group. At the core of this is “static” information such as the common drugs used for treatment and their side effects, the location (and quality) of local hospitals and clinics, etc. Similarly most members would be looking to discover the personal experiences of other sufferers and/or supporters, and to share their own. Members may want to communicate openly in the group, or one-on-one with other specific members as the mood and circumstances take them.

The challenge, then, is to design a CHI that can be tailored for the individual members’ cultural needs that will interface to the common “back-end” system associated social networking such as blogs, wikis, chat rooms and discussion forums. This paper explores these multi-cultural dimensions in detail, and proposes a “universal metaphor” to address them.

Keywords

Design, health, interface , metaphor, online, support group

1. Introduction

The purpose of this paper is to explore the potential for a human-computer interface (HCI) design that is specifically addresses the needs of people requiring online support for health problems. The need for online support groups will be explored, and this will identify the special needs for such an HCI. The role of metaphor in HCI design is discussed, and a metaphor for online support groups is proposed. The issue of semiotics as it applies to the graphical symbols to be used in the HCI is investigated, and a set of potential symbols is proposed. The paper ends by mentioning the ongoing work being conducted in this regard, and suggests further work that is needed in this area.

2. The context

Face-to-face support groups for a variety of illnesses have been in existence for many decades, the first reported being Alcoholics Anonymous which started in 1935. Since then, support groups have proliferated in various parts of the world (although curiously not all parts of the world (Oka & Borkman, 2000). There are several operational modes for these groups – from professional led groups, started and run by psychologists, psychiatrists or other health professionals, to consumer led groups, started and run by sufferers themselves. It is also quite common for people closely related to someone with an illness to start their own group, and thus there are not only groups for sufferers, but for supporters as well.

It has been shown that regular attendance at a support group is generally beneficial from a health point of view. Kurtz (cited in Kyrouz, Humphreys & Loomis, 2002) states that more than 80% of a bipolar disorder and depression group members reported coping better with their illness since joining a group, and the rehospitalisation rate dropped from 82% to 33%. It has also been reported that medication dependence of these sufferers is reduced and social reintegration is improved. For instance Moos, Schaefer, Andrassy & Moos (2001) state that "… patients who attended more self-help group meetings had better one-year substance use and social functioning outcomes than did patients who were less involved in formal and informal care." Rodgers and Chen (2005) report that, in an online group dealing with breast cancer, the number of participants feeling optimistic about their illness almost tripled, with almost half the group reporting an increased ability to cope with their illness. Huntington et al. (2004)also report a general positive outcome from online support group users. Given the overloaded state of most national health-care systems this is a positive outcome not only for the sufferer and their supporters, but for health-care systems in general.

Perhaps the most positive aspect of being a member of a support group is the personal interaction with sufferers (and supporters) of the same illness – the sharing of hopes, fears, anxieties, successes and failures, the "you are not alone" feeling. In a culturally diverse country such as South Africa, it is quite common to get attendees from very varied cultural backgrounds. The one thing they do have in common with each other, though, (apart from the illness) is their locality. Face-to-face support groups serve a relatively small geographic area, and thus have limited reach in terms of population served. The effort and dedication needed to start and maintain a support group results in large parts of the world being unable to actively participate in support groups.

3. The problem

Susannah Fox (2006), an Associate Director for The Pew Internet & American Life Project found more than 113 million adults have searched for health information online in the U.S.A. They estimate that 70-80% of adults with Internet access use it to locate information about health care. Whilst extrapolating America-based statistics to the rest of the world is tenuous, it still provides an indication of the extent to which the Internet is being used for health related

matters. Given this, it is only natural that there has been a tendency to attempt to use the Internet as a medium for support groups in these last few years. This reflects the modern trend of Internet users' increasing engagement with social networking sites such as Facebook and Twitter. People no longer have to be present in the same place, or even at the same time, and the conversations and knowledge can be made persistent through the use of suitable web-site archives. This alleviates three of the most common limiting factors of face to face groups.

Ning.com is a good example of a modern community-configurable social networking product. Ning offers all of the basic functions expected from such a facility – chat, discussion forums, blogs, email, individual comment walls, and photo, video and music sharing. The user interface, in terms of layout, colour schemes and some other features is configurable by the network "owner". However, this interface still presumes that the user understands all of these technical terms and that the user understands the intended, conventional use of these facilities.

However, such technology-based support groups introduce a major problem of their own – how can a culturally sensitive user interface be presented to the user? Cultural aspects that may need to be considered include gender, age, religion, language socio-economic status, local cultural norms and technological expertise. The latter of these is never a problem in face-to-face group meetings, while the others are generally accommodated by the often intuitive process of "non-verbal communication", or body language. Those cultural signals are not available to other users online, unless they are specifically transmitted through, for instance, the user's profile, but even this can be seen as being culturally insensitive.

The information needs of support group members vary continuously, depending in part on their level of knowledge and understanding and their current circumstances. However, their information needs are not complex, and this is discussed in the following section.

3.1 An "information" perspective

In general, support group members look for the same set of information and help. For the purposes of this paper, information is divided into the following distinct categories:-

- "Static information". This is information that changes rarely, if at all, and includes information on local clinics and hospitals, the documented purposes and side effects of various medications, etc. Much of this will be well documented "book" knowledge.

- "Dynamic information". This is information that is generated largely from the experiences of group members, and is constantly being either changed, challenged or supplemented. Such information may, for instance, include advice and personal experiences on life style, spiritual guidance and so on.

- "Interactive information". This might be a simple request for advice or information that is not yet included in the static information section, or may be a genuine cry for help from someone who needs immediate care and support. This category is the most likely to be time-dependent.

Similarly some, hopefully many, members of the group will want to contribute their knowledge under the aforementioned categories.

Management of this information can easily be accommodated using modern technologies. Wikis and static web pages, for example, are well suited for storing and presenting static or near static information. Experiential learning can be gathered through blogs, discussion forums and even chat rooms into a collection of dynamic information. An appropriate on-site search engine will enable users to navigate to and between the various information sources. However, the technological prowess of the Internet user cannot be assumed. With the ever increasing connectivity of people to the Internet through work, educational or community facilities and through the use of mobile technology, there are still many Internet users to whom the words "blog" and "wiki" will be completely alien.

With so many technologies available (with more coming) and with the potential for an extremely diverse user cultural base, a significant challenge is posed as to how to present the users with a suitable user interface to access these various information types. Metaphor is a vehicle that has been used successfully in many interaction design cases, and the applicability of metaphor for an online support group is now discussed. The words "paradigm" and "metaphor" seem often to be misused, and it is important to clarify their meaning here.

4. Metaphors and paradigms

Authors talk about "the desktop paradigm" and "the desktop metaphor", or "the windows paradigm" and "the windows metaphor" almost as if the terms are interchangeable. Arndt states that "…the paradigm concept itself remains somewhat vague and unclear. This is partly because *paradigm* has taken on different meanings over time." (Arndt, 1985) Even the originator of the modern scientific concept of paradigm, Thomas Kuhn, has been accused of using the term in multiple, confusing ways in his (Kuhn's) own work (*ibid*). Morgan (1980) proposes a hierarchical model where a paradigm may support more than one metaphor. This model is much quoted, and will be used here.

"Paradigm" refers to a conceptual reality. Thus in software development the "functional decomposition paradigm" has long been used, where applications are broken down into functions in a similar way to mathematical formulae. More recently the "object oriented paradigm" has been used to describe applications in terms of their interaction with real-world objects. Paradigms are often supported by specific ontologies and epistemological stances as in Burrell and Morgan's four world views of social theory (Burrell and Morgan, 1979 cited in Morgan, 1980)

Metaphors are generally known as a literary device, used to allow authors to express thoughts and feelings on one subject using a different, seemingly unrelated subject for context. A commonly used example is in the Shakespeare play "As you like it", where the character Jaques says "*All the world's a stage, And all the men and women are merely players; They have their exits and their entrances.*" Lakoff and Johnson (1980) describe a plethora of everyday metaphors that are used in common (English) speech, such as "argument is war", where the participants are described as winners and losers, and where people fight to make their point of view heard.

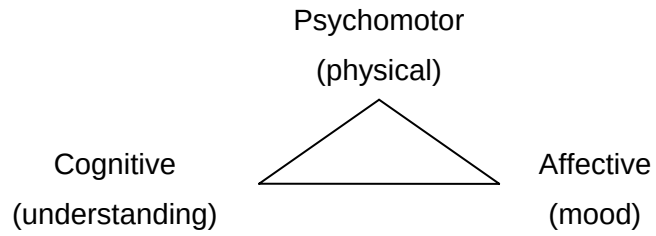
The vocabulary of metaphors is ill-defined. For instance, using the above example, Averbukh et al. (2007) would call "world" the target domain, and "stage" the source domain. Blackwell (2006) on the other hand would call "world" the topic of the metaphor, and "stage" would be its vehicle, and other nomenclatures exist. The former is more intuitive and recognizable to the IT world, and will be used in this paper.

4.1 Three interaction paradigms

Beaudouin-Lafon (2004) identifies three primary (HCI) paradigms; computer-as-tool, computer-as-partner, and computer-as-medium. The first of these harks back to the days of origins of the modern "windows-icon-mouse-pointer" (WIMP) interface, allowing users to (somewhat non-intuitively) "drag and drop" and otherwise manipulate screen entities. The second paradigm is more subtle, alluding to the anthropomorphic elements of HCI such as speech input and "intelligent agents". The final paradigm, "computer as a medium", is the one of most interest at present. This paradigm embodies all of the social networking facilities such as chat, discussion groups etc.

The model most often used for discussing the learning is Bloom's Taxonomy (Fig 1), and it is also commonly used in interaction design. It is particularly relevant here.

Figure 1: Bloom's taxonomy of educational objectives



The "computer-as-tool" paradigm focused a great deal on the psychomotor element – how easy is it to use the interface. The "computer-as-partner" paradigm concentrated largely on the cognitive side – how easy is it to learn and intuitively understand the interface. It is in the final paradigm, the "computer-as-partner", that affective matters such as mood and culture need to be addressed.

4.2 The use of metaphor

Whereas the traditional use of metaphor is in linguistics, visual metaphors are also commonplace. "Greater is up" is used linguistically, as in "turn the volume up" and "tighten the screw up", and an up arrow is often used to designate this. Similarly "time is a direction" is iconised as a right arrow indicating forward in time and a left arrow indicating back in time, as in computer screen navigation.

The use of metaphors as human-computer interfaces has a long history. Both Microsoft and Apple developed a "desktop metaphor" for their operating systems' HCI. This allows users to use such terms as "file cabinets" and "waste bins" in an IT context, as if they were real office artifacts. Similarly, when malicious, self-replicating computer code began to circulate through the world, the metaphor of a "computer virus" was quickly adopted and terms such as "virus infection" became commonplace.

This, then, sets the scene for the introduction for the proposed "small town" metaphor for an online support group.

4.3 Mapping metaphors to applications

The original metaphor for the Internet was "the global village". This was used to show how the

Internet was “making the world smaller”, how the Internet promoted community building, and of course introduced the “information superhighway”.

The global village has served as a useful metaphor in many ways (although there are inevitably many criticisms of it). However, the concept of “village” is not truly universal, in that a village in, say, the Sahara Desert will have little in common with a village in rural England, due to both cultural and geographic reasons. One of the most universally identifiable human structures must be the “small town”. Whilst rural dwellers may not easily identify with a city, nor city dwellers with a rural village, both are likely to identify with the concept of a small town. Almost all towns have very similar characteristics and components. For instance, any small town will have at the minimum one place of worship, one communal meeting place, one shop, one doctor, one library, etc.

One of the purposes of using metaphors is to make the user feel at ease. For instance, users may not want to learn how to “blog” but would not hesitate to use a diary, since that concept is reasonably entrenched in most industrialised cultures. Thus elements of the small town can be mapped to standard social networking software applications to help users “feel at home” and to make “navigation” easier. (Interestingly, both of these terms fit perfectly into the “small town” metaphor!) Thus:

- The library will lead to some source of static information such as web pages or a wiki, addressing the static information requirements of users. This is likely to be updated mainly by the site owner, or at least moderated by such a person. A valuable item in the library collection would be an encyclopedia to explain some of the more technical terms. This could point to, for instance, Wikipedia. An online support community could justify building it’s own wiki, which in fact is essentially what a “frequently asked questions” (FAQ) document is. As far as the proposed metaphor is concerned, it should be noted that libraries come in many guises, from buildings (new and old) to buses (for mobile libraries) to bookshelves in the corner of a common meeting room.

- The communal meeting place will be where people will go to be with other people, be it for scheduled meetings or spontaneously. This is the access point to both the discussion forums and the group chat facilities. Users wanting to talk privately would migrate to a private chat room. The notice board in this space would be the access to the blog facility.

  This will be a major cultural point of departure. For instance, in some societies, the pub is a common meeting place. For others, it may be the coffee shop, the town hall, or even their place of worship. People wanting to meet privately may go to a coffee shop or go for a walk in the park.

- The place of worship will be a reserved discussion group and chat area, similar to the communal meeting place, but dedicated to spiritual matters. Again, this will assist with cultural identity

The use of metaphor allows us to extend the original concept by looking at attributes of the source (the “small town”) and mapping it back to the target (the support group web site). For instance,

- The information bureau (tourist information, citizen information, etc) can be mapped back into the social networking software realm as, perhaps, the site map or FAQ.

- The police station can be mapped to both a security centre (advising people of security issues) and to a "missing persons bureau" to track citizens that have not been seen for a while (e.g. may have been hospitalized).

- The village shop can be an e-commerce portal for browsing and purchasing books and any other relevant merchandise such as T-shirts, etc.

- The "crossroads" can be a place for people to go when they are "lost" and looking for guidance.

- The hospital can be a place for "emergencies", and potentially doctors could be organized to be on call.

- The local newspaper can be used in many ways, e.g. for advertisements, for notices of functions, articles of interest, etc.

- The school can be used to access training materials on, for instance, cognitive behaviour therapy, stress management, diet etc.

- The site archives can be kept in the museum.

The development of this is limited only by the imagination. The metaphor can even extend to personal roles within a community. For example,

- The site owner can take on the role of "mayor", or "elder statesman".

- The moderator could become the chief-of-police.

5. Cultural matters

Given that the current Internet HCI is based on the WIMP model, graphic symbols must now be assigned to the various functions available, and hence, through the use of metaphor, to the various appropriate elements of the small town. As (Cho et al. (2009) state,

> "When pictograms having culturally different interpretations are used in intercultural communication, misunderstanding may arise between participants having different cultural backgrounds. One way to prevent such misunderstanding is to switch the pictogram selected by the sender to a more culturally appropriate pictogram suited to the receiver. To do this, we need to detect pictograms having culturally different interpretations."

Clearly, if a non-meaningful icon is used to signify an access point in the "town", the whole point of the visual metaphor will be lost. However, the use of specific icons will lead to the potential for cultural insensitivity. For instance, using an icon depicting a Christian church as the access method to the spiritual guidance facility may not be well accepted by the Moslem community. Neither would the use of a pub for a communal meeting place. Yet both of these would be considered "normal" in many parts of the world. Thus a user configurable interface would be the ideal solution.

Table 1 identifies some of the many possible culturally dependent points of contact.

Table 1: Different cultural views of town facilities

Town facility	***Possible interpretations***			
Library	Building	Bus	Pile of books	
Public meeting place	Town hall	Church hall	Pub	Coffee shop
Private meeting place	Coffee shop	Park		
Spiritual centre	Church	Mosque	Synagogue	Temple

5.1 Signs, symbols and semiotics

If graphic images are to be used for navigation and representation purposes in an international setting such as a website, it is important that these images are carefully selected to be both universally known and yet culturally sensitive and meaningful. Multilingual sites have been around for some time, but the multi-lingualism extends only to lexical text, and even then is usually limited to a very few languages. Little thought seems to have been given to the universality of symbols in such cases. In order to consider this aspect, a semiotic approach is used.

Semiotics is the study of signs. As a scientific specialization it has developed its own, somewhat confusing and even obscure lexicon. For instance the word “text” refers to anything that conveys a message, from words to music to photography, films, and inevitably to graphic symbols on a computer screen. The familiar “icons” that we use in HCI are, to semiologists, not necessarily icons, but may be “symbols” or even “indexes”. One critic has even gone so far as to say that “semiotics tells us things we already know in a language we will never understand”. However, that language must be used if one is to understand and discuss semiotics.

There exist two basic schools of thought concerning semiotics – those of Ferdinand du Saussure (1857-1913) and Charles S. Pierce (1839-1914). Saussure’s dyadic model is relatively simple to understand in principle, although its ramifications and extensions are profound. It says simply that a sign is comprised of a “signifier” and a “signified” where the signifier is the physical or psychological form of the sign and the signified is the concept it represents (Chandler 1994). The Piercean model is triadic, and is comprised of the “Representaman”, an “Interpretant” and an “Object” (ibid). Although working independently, Pierce’s model essential inserts his interpretant, the sense made of the sign, between the representamen (Saussure’s signifier) and the object (Saussure’s signified). The Piercean model is often used for visual semiotics, and will be used here.

For instance the representamen in Fig 2(a) will for most people represent the object “airplane”, where the interpretant will be “where I see this sign, there will be flying activities” (based on Ferreira, Barr & Noble, 2005). Clearly, the interpretant is wholly embedded in the cultural context of the reader. Ironically, the sign depicting a bird flying Fig 2 (b) is not typically associated with flying, but with peace. This derives from story of Noah and the Ark (Genesis 8:8-12, and similarly in the Torah and Qur’an), although “hope” is another possible object. Again

in the Bible, the dove is used to represent the Holy Spirit (Matthew 3:16) and the phrase “wings of a dove” is used to allude to flying (or at least travel) in Psalms 55:6.

Figure 2: Semiotically conflicting signs

(a) (b)

5.2 “Text” creation

The same problem currently exists with graphic text (in the semiotic sense) that existed with desk-top publishing in the 1980s; the advent of relatively cheap software packages to perform this function means that suddenly everyone can be a “symbol designer”, rather than leaving it to the previous specialists, graphic designers. One has only to think of the number of symbols used to denote email to see this.

The concept of code is an essential part of semiotics. All messages are inextricably based in codes of some type, and codes in turn are embedded in, or defined by, cultural knowledge and awareness. Learning the symbolism of a culture is equivalent to learning a whole new language. Even looking at photographs and films has to be “learned”, in that the brain must make new connections between, say, implied depth of field in a photograph and real depth of field sensed by our binocular vision and variable focus eyes. Even the simple icon of an arrow for navigation is unreadable to a culture that never invented weapons like bows and arrows, and the left-pointing arrow for “back” is based purely on certain cultures’ writing style of left to right.

On a web site (and indeed on most computer interactions) there are a wide variety of coded messages such as text (in the traditional sense), icons, symbols, any of which can be considered foreground or background messages. The term “blog”, for instance, has little meaning in itself, and is interpreted in many different ways by experienced computer users. On existing social networks many new users shy away from blogging as they are scared of doing something wrong. When blogs are explained as being a publicly available personal diary, expressing the bloggers reflections on life, then those same users are far more comfortable with the idea. The term “blog” is a coded message, but it is certainly not a universally understood code. A major problem then becomes that the culture of the website designer is imprinted onto the HCI, both their technical culture (almost certainly IT based) and the social culture. They will inevitably use these cultural codes to formulate their texts without necessarily thinking about or understanding the code set used by the user.

6. Graphic requirements for an internationalized website

If a health support website (or indeed any website) is to be truly international then an international set of graphic symbols will be needed. As shown above, however, this is virtually impossible to achieve. A solution is to have two sets of symbols; a default set for when users first enter the site, and a set of user selectable symbols for users to configure their own particular variations for the interface. The former will need to be as close to international as possible, while still conferring meaning in the given context.

6.1 International sign sets

Certain domains have successfully managed to internationalise a symbol set, for example in electronics meteorology. Bevan (2001) found three disadvantages for user interface standards, including the constraint on design and innovation and the fact that standards can quickly

become outdated. Semiotics seems to suggest that culturally embedded symbols will only change at the rate that cultures change, which is typically very slowly.

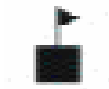
Dymon (2002)investigated cartographic signs for use in emergency settings such as the management disaster areas after hurricanes, floods, fires etc. Some of his findings are very illuminating on the topic of international symbology:

- "Hazard and emergency symbology is not readily available. It required considerable amounts of searching since information was found hidden on web pages and maps".
- Symbols are often software dependent, and often do not scale well.
- Symbols are often personnel dependent.
- Symbols are often situation dependent.

Since the metaphor for a "support town" is geographical in nature, the use of many cartographic signs is indicated.

With reference to the proposed metaphor the following signs may be proposed.

Table 2: Proposed and optional symbols for the town map

	Proposed standard	**Cultural options**
Public meeting place (town hall)		
Private meeting place (telephone)		
Spiritual centre		
Hospital (medical centre)		
School		
Police		
Information		

Dymon (2002)does not pretend that these symbols are truly international. His research was aimed specifically at the American Federal Emergency Management Agency, and thus the semiotic code used here is American. He does suggest in his “Recommendations for the Continuation of the Project” (ibid) that cultural issues in terms of meaning and appearance need to be addressed. He also mentions the issue of symbol colour, which is in itself a cultural factor.

7. Conclusion

The importance of metaphor in interaction design, including HCI, is well established. Metaphors assist with both usabilty and learnability, and are especially valuable in situations where users may be unfamiliar with the concepts being implemented. However, in a global setting such as website, the cultural acceptability of the interface needs to be addressed. Different cultures interpret symbols in various, often contradictory, ways. Thus the implementation of the metaphor needs to be customisable by the user, so that the user can “code” their context for the interface themselves.

Problems to be solved – ongoing and future research

This approach to an interface potentially creates as many problems as it solves. For instance,

- Should the visual metaphor be carried forward to the target software? In other words, should the image of, say, the church/mosque/synagogue lead to a chat room with the visual imagery of the inside of such a building? This will make the interface extremely complex to build, and possibly very slow to load.

- Will members of various cultural groups (say, religious groups) want to communicate in a common forum, or stick purely to their own cultural group? The latter will be very limiting in terms of the contribution of minority groups, whereas the former raises a second problem – if all of the cultures are “thrown together”, then how do we know what the cultural background of the other participants is?

Research into how to implement such an interface is currently in progress. There seems to be no standard or best practice for such an interface, and so a variety of methods and languages are being tried in order to determine how best to effect implementation. It is often impossible to separate the HCI from the underlying platform, and thus there may be a platform dependency as well.

Informal discussion has shown that the proposed symbols are actually not well recognized. Especially puzzling is the symbol for “school”. Further research, using a focus group approach, will be used to address this.

References

Arndt, J. 1985. "On making marketing science more scientific: role of orientations, paradigms, metaphors, and puzzle solving", *The Journal of Marketing,* 49(3):11-23.

Averbukh, V., Bakhterev, M., Baydalin, A., Ismagilov, D. & Trushenkova, P. 2007. "Interface and Visualization Metaphors", *Lecture Notes in Computer Science,* 4551:13-22.

Beaudouin-Lafon, M. 2004. Designing interaction, not interfaces. In *Proceedings of the working conference on advanced visual interfaces.* ACM: New York.

Bevan, N. 2001. "International standards for HCI and usability". *International Journal of Human Computer Studies,* 55(4):533-552.

Blackwell, A.F. 2006. "The reification of metaphor as a design tool". *ACM Transactions on Computer-Human Interaction (TOCHI),*13(4):490-530.

Chandler, D. 1994. Semiotics for beginners. Available WWW: http://www.aber.ac.uk/media/Documents/S4B/semiotic.html (accessed 10 May 2009).

Cho, H., Ishida, T., Yamashita, N., Koda, T. & Takasaki, T. 2009. Human detection of cultural differences in pictogram interpretations. *IWIC '09. ACM*, New York, NY:165-174.

Dymon, U.J. 2002. "Emergency and hazards mapping symbology". *Department of Geography of Kent State University, Kent, Ohio,* Available WWW: http://www.omg.org/docs/c4i/02-10-02.pdf (accessed 01 May 2009).

Ferreira, J., Barr, P. & Noble, J. 2005. The semiotics of user interface redesign. In: *Proceedings of the Sixth Australasian conference on User interface-Volume 40.* Australian Computer Society, Inc. Darlinghurst, Australia, Australia: 47.

Huntington, P., Nicholas, D., Homewood, J., Polydoratou, P., Gunter, B., Russell, C. & Withey, R. 2004. "The general public's use of (and attitudes towards) interactive, personal digital health information and advisory services". *Journal of Documentation,* 60(3):245-265.

Kyrouz, E.M., Humphreys, K. & Loomis, C. 2002, "A review of research on the effectiveness of self-help mutual aid groups", *British Journal of Clinical Psychology,* 33:198-200.

Lakoff, G. & Johnson, M. 1980. *Metaphors we live by.* University of Chicago Press, Chicago.

Moos, R., Schaefer, J., Andrassy, J. & Moos, B. 2001. "Outpatient mental health care, self-help groups, and patients' one-year treatment outcomes". *Journal of clinical psychology,* 57(3):273-287.

Morgan, G. 1980. "Paradigms, metaphors, and puzzle solving in organization theory". *Administrative Science Quarterly,* 25(4):605-622.

Oka, T. & Borkman, T. 2000. "The history, concepts and theories of self-help groups: from an international perspective". *Japanese Journal of Occupational Therapy,* 34(7):718-722.

Rodgers, S. & Chen, Q. 2005. "Internet community group participation: psychosocial benefits for women with breast cancer". *Journal of Computer-Mediated Communication,* 10(4):article 5.