GENDER ISSUES IN HCI DESIGN FOR WEB ACCESS

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Abstract
We consider the design and provision of websites with respect to gender issues from various perspectives. A general view of the field is given and educational issues are specifically considered in relation to gender differences in the use of IT as an effective educational aid, especially by children. Human-Computer Interaction (HCI) models at different levels of abstraction are presented, together with how gender issues could impinge at each of these levels. A number of examples, both from the commercial and cultural fields, are discussed as design case studies of home pages for websites that exhibit gender-related orientation. Finally, looking to the future, online gaming is discussed in the context of usage. It is hoped that the guidance provided here will help minimize any gender discrimination on websites, increasing general accessibility in the process.

INTRODUCTION

“Everyone has his style when designing a site. There is no such a thing as a ‘feminine design’ or a ‘male design’. The most important thing here is to seek inspiration to create something different each time.”

– Mark, male web designer, http://www.redpolka.org

Even if half the potential users of the web are female, it is still a rather male-oriented environment. A study of UK university websites has shown 94% of them to have a masculine orientation, compared with only 2% having a female bias, with 74% of them designed by male dominated teams and only 7% by female teams (Moss & Gunn, 2005; Harden, 2005; Tysome, 2005). This is despite the fact that there are more female than male students. It was found that men preferred regular, unfussy, formal content and layout in straight lines whereas women preferred more colour and rounded forms with less conventional design, formality and linearity. Both men and women seem to prefer websites produced by designers of the same sex. In general, the specific area of Human-Computer Interaction (HCI) and gender issues is not well studied in the research literature. However, Balka (1996) briefly discusses HCI skills with respect to gender and Cassell (2002) discusses video game HCI and how it is often gender-biased.

In this chapter we first consider the background to web interface design with respect to gender issues. In particular, we look at some educational differences. We then consider some HCI models at different levels of abstraction and how consideration of gender preferences could impact on these. A number of websites, both commercial and by way of contrast cultural as well (Baiget et al., 2005), are used to consider various design issues with respect to gender differences. More dynamically and looking to the future, we also consider the issues in online gaming design. In conclusion, we briefly summarize the current situation and what could be done to help rectify it.

BACKGROUND

“If you are design-minded you can really do whatever you want (masculine or feminine design)”


The question over women and their attitude to technology continues to be an interesting one. On the one hand they appear to be very enthusiastic users of mobile phones and text messaging despite the problems there are in the use of these devices (Faulkner & Culwin, 2005), while on the other hand their less enthusiastic take up of computers still continues to be a cause for concern. There have been several attempts to look at gender issues in relationship to design, with technologists attempting to create designs that will particularly appeal to women. This section looks at the major aspects of HCI that need to be considered on the web and how design might be slanted towards creating systems that will support and encourage women in their use of the web.

Harding (1986) argues that “women have been more systematically excluded from doing serious science than from performing any other social activity, except,
perhaps frontline warfare.” She says that a concentration on the hard sciences means that gender is thus viewed as a variable that affects individuals and their behaviour rather than as an aspect of society and its structures. This inevitably affects the way in which technology is designed. As technology increases in the workplace and in the home, so it becomes more urgent for designs to include everyone. This might mean investigating and addressing the differences that may exist between different sections of society, be it due to age, ability, gender, etc. The best way to ensure that people can use a system is to involve them in the design and development process by way of user groups, focus groups and iterative evaluation exercises (Faulkner, 2000).

The research that has taken place in differences between men and women, and their acceptance of technology, would suggest that women are more influenced at first by usability – how easy it is to use a system – and by the responses of others. However, future encounters with the system mean they tend gradually to discount social norms and to concentrate on aspects of usability and usefulness. Males however are initially attracted to systems on the basis of their usefulness and that opinion does not change over time (Venkatesh & Morris, 2000). There is the additional problem that women tend to exhibit low self-efficacy and that can affect their attitude towards new systems. Women tend to assume that if they cannot perform a task with software then it is down to their lack of ability. Men on the other hand blame the system rather than themselves (Beckwith & Burnett, 2004). It would thus appear that web based systems need to be usable and useful if they are to be effective for both men and women. Systems that appear complex at first sight might deter women or decrease their effectiveness.

Web Design Issues – Fonts

Designing web-based applications or web pages is a challenge since the audience might be anyone, in any place, and using the product at any time. Through the work of people like Jakob Nielsen, the design of web pages is now quite well understood. Designers are encouraged to create designs that facilitate easy access and navigation, avoiding clutter. Reading from the screen is still far from pleasant and users typically prefer to scan rather than to read pages completely (Morkes & Nielsen, 1997). In fact, there is a gender difference over this aspect of design, with girls typically being more tolerant of reading on a screen than boys, though this could simply be an extension of the fact that girls develop language skills sooner than boys. However, the basic guideline that less is more where text is concerned certainly applies to web pages.

Font use has been examined in some detail. Nielsen carried out some work with older users and discovered that the most sensible decision for readability was to use at least a 12 point size of font if possible (Nielsen, 2002b). The very young need large fonts in order to facilitate reading. Although youngsters and young adults can read smaller text sizes, they express a preference for a larger size (Nielsen, 2005). The problem is that 12 or 14 point fonts do not look particularly attractive on page, and the also limit the amount of information that can be presented, so web designers tend to choose smaller sizes for aesthetic reasons; it is not more readable however.

Those who experience extreme difficulties reading from the screen may be forced to resize pages, but other users will undoubtedly soldier on or abandon the site. In designing a website, it is wise to consider what will happen if the font size is increased or even decreased since sites should honour user preferences set by a browser. Users do not
like their preferences to be ignored or overruled, although some graphic designers try to do this to control the display of the page. Web users need to feel in control of the system and this need is quite deep-rooted (Faulkner, 2000).

Font type has likewise been the subject of much research, with arguments for and against sans serif fonts on the screen. Although there is evidence to show that serif fonts are more readable on paper the evidence to support this on screen is less conclusive though arguments have raged (Faulkner, 1998). It could be that the on-screen experience is different because of the angle of viewing or it could be that screens are still not as easy to read from as good quality print because the resolution is significant worse. However, sans serif fonts are still the preference of many designers, with Verdana or Arial being the typical font of choice. This is probably still due to screen quality.

Fonts do seem to be a matter of personal preference but it needs to be remembered that an attractive font might attract attention, but it still has to be readable if it is presenting information. Women may prefer more curvy “scripty” fonts, although these can be less readable, especially on a screen, unless a large font size is used. A font that does not really need to be read quickly (e.g., within a logo) can concentrate on looking eye-catching. Designers must not assume that users will struggle to read large amounts of text in a difficult-to-read font. It is faster for them to move to another site.

**Web Design Issues - Colour**

As far as colour is concerned, it is best to limit its use on screen. An exception can be made for children who appear to enjoy bright colours. It is argued that they find bright colours visually exciting and that adults find the same colour schemes distracting. However, women also tend to prefer brighter and warmer colours than men. Background colours are a matter of preference, but if there needs to be a lot of reading to be done on the screen then it is best to adopt a white background and black print or if that is not acceptable then pale colours; blue, yellow and green work particularly well.

Warm colours like red are particularly troublesome as background as they are viewed as moving towards the user and if they are supposed to act as a background then this is obviously problematic. Red and green should be avoided on screen where possible and should not be used to indicate states without the presence of a secondary cue. This is because the most common form of colour blindness is red-green and anyone thus affected may have problems differentiating between the colours. If it is necessary to use these combinations as indicators then ensure that there is a secondary cue. For example traffic lights do not pose a problem for the colour blind because they also offer a positional cue for the driver.

On screen, either positional cues or sound cues could be used as a secondary indicator. Incidentally, there are fewer colour blind women than men. This is because in order for a woman to be colour blind both her parents need to be colour blind. For a man, colour blindness is inherited via the mother.

**Latency**

The last issue considered here is that of latency. Sites need to be fast. Users of a hypertext system need a response time of less than one second when swapping between pages, if they are to experience the sense of continuity. A delay of more than this will be noted by
the user as a pause. A one-second delay is probably the maximum users can tolerate without having their train of thought interrupted. This means that web pages need to be delivered as quickly as possible (Culwin & Faulkner, 2001). This does create a problem on the web since the delivery of web pages is partly down to technical issues and network access speeds that are often beyond the remit and control of the designer. However, there are design decisions which can be made that will cause the slowing down of entry to a site or the loading of a page. For example, forcing users to log on, or to watch animated introductions, or to read acceptance pages will all slow down entry to a site. Large images also cause slow downloading.

**Women and Technology**

In designing a site, it is necessary to consider what the user is doing, what sort of delays they can tolerate and how these delays can be conveyed to the user beforehand. Delays that are known and can be planned for are much better tolerated than delays that are unexpected. It is possible that women are more patient than men in the case of delays, but often this depends more on the interest in the material that has been requested.

It would appear from an examination of women’s use of technology that when they see an advantage of a technology they are willing to invest the time to use it. Women are not technophobes *per se.* The uptake of the mobile phone and the enthusiastic use of text messaging by women and girls demonstrates that they have no great problem in gaining expertise in a technology which they find useful (Faulkner & Culwin, 2005). Women typically use all manner of household and personal technologies. They have in the past used new technologies even though these have been difficult and time consuming to learn; for example early sewing machines were far from easy to use (Forty, 1986).

The slow uptake of computer technology does not appear to be due to a dislike of the technology, but rather a lack of interest in anything it had to offer. Norman (1998) thinks that if technology confers benefits it will be used:

> “In the early days of a technology, it doesn’t matter if it is hard to use, expensive or ungainly. It doesn’t matter as long as the benefits are sufficiently great: if the task is important, valuable, and can’t be done in any other way.”

His beliefs are certainly borne out by the success of other technologies that have conferred benefits.

The web needs to address women’s needs if it is to capture their hearts and minds; it must ensure that it offers advantages and solutions with minimal learning investment. Women are currently enthusiastic users of online communities (Beler *et al.*, 2004), with some communities dominated by them or used exclusively by them. An examination of these communities will show that women are taking part effectively and learning how to use the technologies, posting messages and replies, downloading and uploading images and programs. Indeed, a report from Stanford has made just this point; by far the biggest block to Internet use is not gender, ethnicity or even income, but age (Nie & Erbring, 2002).

Design for the web needs therefore to aim to be usable by everyone without any extensive learning requirements. It is always easy to find a new site and users are fickle. If designers want people to use their sites then they must make those sites accessible for
everyone. That means catering for men, women, girls, boys, old, young and those with special needs. Many of the design decisions made for accessibility by those with special needs or the young or elderly will often make the site easier to use for everybody (Bowen, 2005). Good design is inclusive not exclusive (Clarkson, 2003); that is it is designed to consider everyone rather than the few. In many cases, designs aimed at those with reduced motor ability or visual acuity, for example, are preferred by all users, simply because they are easier to use.

The way to assess user needs is by ensuring that they are involved in the process of design and that applications are evaluated with a representative group throughout the developmental process (Faulkner, 2000), including women as appropriate. This might mean that we must design a website for specific users (sometimes women or girls for example), but we need to design sites that will cater for all users. Good designs do just that; bad designs inevitably make sites difficult to use so that those who have special needs or require encouragement to use the web will give up or be diverted elsewhere.

EDUCATION ISSUES

“Masculine design is Bauhaus, emphasizing form and function. Except the function is the website itself, not its content.
Feminine design is Dada, emphasizing expression and the destruction of form.”

– http://www.redpolka.org

Gender issues are an important consideration for online information access in general, especially with respect to educational matters (Inkpen, 1997). Different attitudes and approaches to learning influence the effectiveness of educational material, both within a real educational institution and on its associated website. The use of computers and networks for learning is increasingly prevalent as an educational aid. The interface to the information is very important in minimizing the barrier to the information that is being made available.

A study of 11-year-old children in the context of web-based science lessons (Leong, & Hawamdeh, 1999) found that boys used computers more regularly than girls (e.g., for games) and also used the World Wide Web more. However, it also showed that girls preferred web-based lessons to traditional class-based lessons compared to boys and that they favoured working in pairs more than singly. Compared to girls, boys disliked reading from the screen since they had more difficulty with longer pieces of text.

Nachmias et al. (2001) found significant gender differences in a study of 384 junior high and high school students in Israel. Boys were more extensive ICT (Information and Communication Technology) users than girls in general. They spent about 9.4 hours per week using computers compared to around 5.6 hours for girls. The difference was most dramatic at home (6.7 vs. 3.5 hours) whereas school usage was more similar (1.4 vs. 1.3 hours), presumably because this was largely directed use. On the other hand, a study of 110 eighth and ninth graders (14–15 year olds) on a three-month virtual classroom course by Shany & Nachmias (2001), also based in Israel, did not find any particular correlation between gender and various uses of ICT (e.g., bulletin boards,
forums, email, web searches, etc.) with respect to thinking styles in an educational context.

Nielsen (2002a) reports that there are bigger differences between boys and girls with respect to website usability than for men and women in general. In his study he found that 40% of boys complained about verbose web pages compared to 8% of girls. On the other hand, girls criticized the lack of instructions much more (76% vs. 33% for boys). Boys spent more time alone on the computer, whereas girls spent more time with a parent. However Nielsen notes that age differences are more important that gender difference when considering web design usability. When it comes to the digital divide, age, education and income are the key factors, compared with race/ethnicity/gender, which are statistically insignificant with less than 5% effect on the rate of access (Nie & Erbring, 2000). Males used the Internet around 1.2 additional hours per week compared to females, i.e., not a huge difference. Gender differences were found to be more significant for those based or working at home.

Traditionally, men are more attracted to direct use of computers, but for more indirect use through other media, the gender balance is more even (Dierking & Falk, 1998). However the subject matter being presented also has a bearing, with evidence that in the case of fine art, females are more prevalent users, even when technology is used. In the area of online museums, Bowen et al. (1998) noted that an early survey of virtual visitors recorded 46% as being women compared to only 22% of high-use Internet/web users being female in a more general survey at a around the same time. Thus, the gender balance of those with an interest in culture may be better than the general case (Bernier, 2002). There is also a bias towards older users visiting cultural websites compared to the norm on the Internet.

Chadwick & Boverie (1999) considered the gender gap in the number of men versus women who completed a museum website visitor survey to be worthy of further study. Around 62% of those who completed the questionnaire were male and only 38% were female. However, they questioned whether men are more likely to complete an online survey.

A more recent survey of online discussion forum usage (e.g., electronic mailing lists, web forums, newsgroups, etc.), specifically by museum professionals, has been undertaken by Bernier & Bowen (2004). This reports that 65% of the 153 respondents were female, not so surprising given the predominance of women in museum-related jobs. There are more male museum managers and IT workers, but education-related posts are largely occupied by women. Collections managers and researchers are more evenly divided by gender. 55% of ICOM (International Council of Museums) members in the UK are female; in Canada, 79% of heritage workers are women and in the USA, 84% of archivists and librarians are female. The typical first-time online discussion forum user was a US 25–44 year old female, mainly from education-related areas, wishing to obtain information. Women over 60 were more likely to be using online forums to ask a question in their area of expertise. Men were most likely to be 45–59 years old, seeking information and sharing knowledge. Daily users were typically 25–34 year old females.

Overall, there are some interesting and notable differences in the educational and cultural fields online and these are worthwhile of consideration by web designers when producing education subject matter and related resources. This will help to avoid any prejudicial bias in the material on offer.
HCI MODELS

Interaction between a person (female or male) and a computer-based information system can be viewed as a dialogue or conversation. Modelling this dialogue is an important aspect of Human-Computer Interaction (HCI). Such models provide a useful framework for the design and evaluation of user interfaces and the interaction process.

There are a number of ways to model interaction in HCI. However, the majority of these approaches concentrate on modelling the task, often in an office or business context. Some models also provide a simplistic definition of the user in terms such as naïve, novice or expert. Nevertheless, there is significantly more to human interaction than can be described through task modelling. Increasingly, people interact with computers to realize social goals such as enabling social interaction or to gain an experience (Hsu & Lu, 2004). Also, the number of information systems with which people interact is increasing, as is the scope of such systems with respect to everyday aspects of life. These changes and the need to minimize social exclusion on the basis of individual difference are leading to new frameworks for the study of HCI.

An important goal in interface design is to support user individuality. Current approaches include user preferences and personalization in information systems – e.g., see Filippini-Fantoni et al. (2005). However, these strategies try to accommodate individual differences once the interface has been completed rather than take account of such aspects during the design process.

The next two sections introduce the main HCI modelling techniques that have been developed and a number of models from the realms of sociology and social psychology, with special consideration to gender issues. This part goes on to describe in greater detail a more holistic modelling approach that takes account of social and person context.

Modelling HCI

Many models of Human-Computer Interaction have been influenced by cognitive psychology. For example, the Model Human Processor (MHP) described in Card et al. (1983) draws an analogy between computer processing and the way in which people perceive, process and output information. It defines the human perceptual, motor and cognitive systems in terms of the storage capacity and decay times of memory and processor cycle times.

A number of modelling techniques have been based on the MHP including the Goals, Objects, Methods and Selection (GOMS) model – which includes the Keystroke model (Card et al., 1983) – and Cognitive Complexity Theory (CCT) (Kieras & Polson, 1999). A more recent model of the human mind using a distributed architecture of human cognition has led to the definition of the Interacting Cognitive Subsystems (ICS) model (Barnard, 1986).

Other HCI models use grammars to describe the cognitive and physical actions a user must know/perform in order to use a system. For example, the Command Language Grammar (CLG) (Moran, 1981) describes a system in terms of three components: the
conceptual component (task and semantic levels); the communication component (syntactic and interaction levels); and the physical component (input/output devices).

A series of related modelling techniques including Task Action Language (TAL) (Reisner, 1982), Task Action Grammar (TAG) (Payne & Green, 1986) and Extended Task Action Grammar (ETAG) (Tauber, 1990) use Backus-Naur Form (BNF) to describe the sequence of physical observable and cognitive actions required to complete a task (the user task language). By analyzing the features of the resultant grammar (symbols, strings, rules), the relative complexity of different interaction designs can be compared.

External–Internal Task Mapping (ETIT) (Moran, 1983) analyzes the relations between the real world tasks that a user wishes to complete (the external task domain) and how those tasks are mapped on to the computer system (internal task domain). This method allows both the complexity of the system and the possible knowledge transfer from one system to another to be determined.

A primary goal of HCI modelling techniques is to design, compare and evaluate interactive systems. Analysis of the models can predict a variety of system interaction properties. These include: the speed at which a user can complete a task; how easy it is to learn and remember the system; how easy it is to use without making errors and, whether skills can be transferred from one system to another. The emphasis of these techniques is task decomposition. While some of these approaches consider other aspects of interaction, such as motor skills or environmental context, individual user differences such as those related to gender are not the main focus of the analysis.

Other Models of Interaction

In research areas such as sociology and social psychology, models of interaction have been developed that consider how people interact naturally and in social situations. In particular HCI researchers have looked at the work of conversation analysts to give them insight into how interaction takes place. This micro-analysis of everyday conversation in situ has identified naturally occurring structures, protocols and patterns of dialogue in human–human communication. These “rules of conversational sequence” are independent of the participants involved and the setting in which they take place (Sacks, 2001). Common structures in natural conversation include: adjacency pairs, patterns of turn-taking and repair of failed sequences.

The potential for using findings from conversation analysis as a means of formulating HCI design guidelines that result in more natural interaction has already been recognized (Norman & Thomas, 1990). Frohlich and Luff (1990) successfully incorporated these elements into an online benefits system which allowed mixed initiative, multi-utterance turn-taking, the repair of previous invalid statements and provided pre-closing sequences which allowed the system to volunteer additional information to the user.

An influential model from the area of social psychology is the social skills model (Argyle, 1969; Hargie, 1997) which draws an analogy between the motor skills used for example, while driving a car and those social skills used in effective social interaction. As with the HCI task analysis models, the participants come together in order to attain a primary goal. Clark (1996) suggests that there are in fact a set of three goals supported by the interaction. In addition to the primary or domain goal the participants also have
interpersonal goals that establish and maintain their relationship and the procedural goals that support the process of communication.

The social skills model places interaction in a person-situation context that determines the particular set of social constraints (many of these gender related) in play. These take the form of social norms, roles, relationships and rules and provide a system that supports the development of co-operating societies and the attainment of shared goals. Within a relationship, individuals take on roles that prescribe their status, responsibilities and rules regarding their behaviour towards each other. Rules ensure the smooth operation of relationships by co-ordinating behaviour, regulating levels of intimacy and avoiding relation-specific sources of conflict (Argyle et al., 1985).

**MODELLING GENDER ISSUES IN HCI**

Figure 1 shows a layered model for HCI that is based on natural human–human communication (McDaid, 2005). This model is a synthesis of social and HCI models and recognizes that communication takes place on many different levels and that multiple goals are in play concurrently. Its purpose is to create a richer, more satisfactory human–computer interaction.

The model is intended as a framework for the design of human–computer interaction in a social context. The following section highlights aspects of relevance to gender issues that could be considered at each layer when designing or evaluating computer based information systems.

![Figure 1. A model of human–human communication.](image-url)
Physical Layer
The physical layer represents the media over which the communication takes place. That is the real physical world through which, for example, sound waves, light waves and even smells travel. The behaviour and characteristics of these phenomena are governed by the natural laws of physics. As part of this real world, human–human communication takes place using those physical phenomena that human beings are able to generate and detect. This layer determines the possible modes or channels of communication that are available for human–human communication.

While we all live in the same world, are there some channels of communication more useful for a particular gender? The evidence that women generally possess better verbal memory skills (Kimura, 2000) might suggest the use of speech interfaces on the web in the future would benefit females in particular. While greater male visual spatial ability, seen for example in 3-dimensional image rotation, might suggest that VRML interfaces would be more usable by men.

Effector Layer
This layer represents the point at which humans interact with the external physical world. It includes the human input and output systems. Information is packaged and sent or received as a co-ordinated set of verbal and/or non-verbal signals. An individual’s ability to send and perceive signals and stimuli will determine the available channels for communication and their specification. For example, a visually impaired web user would rely on speech output generated by text to speech software to interact with a web site rather than the text and images themselves.

Design considerations at this layer in general relate to the physical characteristics of the user. Research suggests that differences exist between the sexes in motor skills, spatial ability and perceptual acuity (Kimura, 2000). Gender specific differences significant to web page design at this level could relate to issues such as the higher occurrence of colour blindness in men or that men excel at targeting skills while women generally exhibit superior fine motor skills. However, investigation of gender differences can lead to interfaces that overcome previously perceived inabilities of one gender and improve interaction for all users – e.g., providing more visual cues in 3D navigation systems (Tan et al., 2003), which may become more prevalent on the web in the future as technology improves.

Cognition Layer
This layer is concerned with recognizing or generating the communication event and interpreting or formulating its associated meaning. At this layer, information may be added to the signal or filtered out thereby changing its content. The transformation that takes place at this layer is determined by a number of factors, which are personal to the individual participants, such as their personality, emotional state, mental schema of the world etc. Errors in perception and transmission can occur when too much or not enough attention is paid to a particular piece of information. These errors can result in overly positive or negative interpretations.

Research indicates that women have superior social cognitive skills due in part to greater verbal ability and differential socialization (Bennett et al., 2005). A specific example would be that generally females are better encoders and interpreters of non-
verbal communications than males. As interface designers design social agents that interact with the user using facial expression, etc., these differences may impact on the usability of the interfaces for different genders.

The layers described above are responsible for the actual physical end-to-end transmission of communication events. The following layers relate to further cognitive processes that form the basis for conscious goal seeking communication in humans. The form and content of the control, session and presentation layers are in particular influenced by the environmental, cultural and institutional context in which they occur.

**Control Layer**

This purpose of this layer is to ensure the reliability of the data that is transmitted and the smooth running of the communication. The processes on this layer are responsible for successfully opening and closing the communication, monitoring quality control, requesting repair of any failure in transmission and acknowledging successful transmission by generating feedback to support continuation of the conversation. At this level, different types of communication feedback with respect to the two genders could be investigated. For example, are there specific forms that opening and closing sequences should take to cater more specifically for males and females?

**Session Layer**

The role of this layer is to synchronize and coordinate the main dialogue. This synchronization of the communication is supported by the elements identified by conversation analysis such as adjacency pairs, rules of turn-taking, insertion sequences, etc. The protocols of natural speech mean that, for example, it is uncommon for participants to talk over each other or for there to be long gaps between alternating speakers. Where a situational influence applies, it will constrain the protocols in use to a subset of those used in everyday conversation, for example, the rules of turn allocation are more limited during an interview, in a schoolroom or at a court of law. Again the question to ask is, are there any gender specific issues that would constrain the form that for example turn-taking would take? It is generally accepted that men and women communicate for different purposes. In both face-to-face and in virtual communities, men communicate to gain social standing and women with underlying compassion and empathy (Gefen & Ridings, 2005). As the web becomes increasingly a medium for human–human communication, this may become a more important design consideration.

The control and session layers primarily support the procedural goals of the interaction.

**Presentation Layer**

The presentation layer deals with those elements and coding that constrain the communication as determined by the social context in which it takes place. Communication takes place against a backdrop of social roles, social responsibilities, as well as social norms and rules. These may include special codes or language sets, recognized by different subgroups such as rules of address (based on gender, culture, class, organization, profession, etc.). The environmental context will determine the particular roles, relationships, rules and norms that are available for use. This layer
supports the interpersonal goals and can also have a constraining effect on the form of the control and session layers.

Different genders take on different roles within society. At this layer, consideration should be made regarding both roles that make up the relationship as well as the rules associated with their interaction. For example for every student there is a teacher. If the teaching role is taken by a computer system, how should the interaction be designed to reflect the different preferences for learning styles of males and females?

**Task Layer**

This layer represents the shared domain of the participants involved in the communication. The task layer supports and defines the domain goals (public and private) of the activity. To participate successfully in a goal seeking activity, the participants must wish to attain the same or compatible goals. They must also share common knowledge and experience of the domain.

Evidence suggests that males and females have different ways of solving problems (Beckwith & Burnett, 2004). Ultimately, all users of the web are trying to perform some task. Understanding how different people (perhaps of different genders) might approach the task could help to ensure that it can be completed efficiently by most people.

**Summary**

Models provide a useful tool for supporting the design and evaluation of user interfaces. In particular, task analysis has been the mainstream HCI modelling technique for a number of years. While still useful, this was developed in an era when computer use was predominantly office-based. Technology has changed dramatically in recent years and much computer use has moved into a social context at home and elsewhere. HCI modelling has been extended to accommodate such changes through the study of human-to-human communication in a social context. The user model presented represents a useful framework for exploring user difference (including gender) in interaction. We believe that more consideration should be given of these aspects in future web design.

**DESIGN ISSUES**

“I do web design and I'm a girl. And I hate pink. A lot.

You may find this interesting – We recently went through a major hiring phase at my job. I'm a web programmer, and the majority of the applicants for my job were female. The majority of the applicants for the graphic designer positions were male. How's that for breaking stereotypes?”


Web design crosses many of the layers previously analyzed. In this section we will focus on how web design and interface design is related to gender issues. In fact web design is
strictly related to the audience. In particular, audience gender is or should be an important issue for designers. A designer should know the different reactions of the genders to graphic elements in order to design effective websites and avoid communication mistakes.

From studies conducted by www.women.com and the University of Chicago it is possible to list some of the communication aspects that women like most (see Table 1):

**Table 1. Layout composition.**

<table>
<thead>
<tr>
<th>IMAGES</th>
<th>COLOUR</th>
<th>LAYOUT</th>
<th>MOOD</th>
<th>TONE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Babies</td>
<td>Pastels</td>
<td>Flowing</td>
<td>Light</td>
<td>Caring</td>
</tr>
<tr>
<td>Butterflies</td>
<td>Neutral Tones</td>
<td>Asymmetrical</td>
<td>Airy</td>
<td>Sharing</td>
</tr>
<tr>
<td>Flowers</td>
<td>Soft Colours</td>
<td>Curves</td>
<td>Bright</td>
<td>Sincere</td>
</tr>
<tr>
<td>Plants</td>
<td>Sky Blue</td>
<td>Smooth</td>
<td>Up-beat</td>
<td>Committed</td>
</tr>
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With these issues in mind, before starting to design a website the web designer should always consider the following:

1. What is the website’s audience? Age, sex, culture, nationality, etc.
2. How should the website be designed to attract the right audience?
3. Should the website cater to a particular gender?
4. Which elements appeal to males; and which to females? (Shapes, colour palette, fonts, sounds, etc.)
5. Should the website attract a specific gender? Why?
6. If yes, how should a specific gender be attracted to the website?
7. Is the website better off with gender neutrality?
8. Which kind of reaction does a particular gender have to the colour used?
9. And what reaction might each gender from different countries/cultures have to the colour used?

In this section of the chapter we will also refer to the concept of “feminine”, “masculine” and “neutral” web design. We intend, with the first two terms, to mean a design that seems to be openly intended to attract users of a specific gender and with the term “neutral to indicate a design that does not explicitly address a single gender.

To define the design for a number of websites, we have combined our personal observations with a test using a focus group of 20 people (10 male and 10 female) of different ages (from 10 to 64); volunteers were interviewed about how they felt about the design. After having them navigate the website, we posed the following questions to them:
1. How do you feel the website? Is it intended for men, women or both?
2. Why?
3. Define the website with three adjectives
4. How would you describe the “atmosphere” of the website and the sensations that you are experiencing using it?
5. Do you desire to navigate the website further?
6. Which colour do you feel is dominating the website design?
7. Which shape do you feel is dominating the website design?
8. Do you find the website easy to navigate and use?

We found our test results confirmed the research that we will illustrate further in the rest of this section.

**Commercial Examples**
We will now analyze four commercial websites, each one very gender-targeted:

- *Surf*, aimed at adult women;
- *Gillette Complete Skincare*, for adult men;
- *Barbie*, for young girls;
- *Action Man*, for boys.

All of these websites show clearly how the design tries to focus on a specific gender.
Surf – www.surf.co.uk

Figure 2. Surf website.

Overall description:
Surf is a washing brand. As for the interface and the text, its website (Figure 2) is aimed at women and made by women. The design is characterized by naïve illustrations and a colourful palette. This gentle and emotional style explicitly tries to appeal to and please a feminine audience.

Colours:
The colour palette is based on fuchsia, hot pink. Pink is usually considered a “feminine” colour and is commonly associated with the feminine stereotype. The Surf web designers have accepted this stereotype and used it to create a humorous and emotionally involving website. The use of bright colours adds to this sensation and appeals to a positive audience.

Shapes:
As pointed out in the introduction, men prefer regular, unfussy, formal content and layout in straight lines whereas women prefer more colour and rounded forms with less conventional design, formality and linearity. This is confirmed by the Surf interface: circles and free-form shapes express emotion, warmth, fun, movement, energy and forms that can be attributed to the irrational, the feminine world. It is a well-known fact that the circle is often associated with women. Actually the Surf interface is based on circles: curved graphic elements, “bubbles”, rounded photographs, birds, flowers, clouds. Besides circles, the naturalistic elements (such as birds and flowers) refer to nature in a typically
feminine way. The overall layout is slightly asymmetrical and this has been recognized as a feminine characteristic as well.

**Font:**
In an emotional site, the web designer can be a little more daring in the use of decorative fonts. In this case, the designers chose to use only graphics fonts, in order to use more swishy fonts and not to be limited to the default ones, even though this gives worse accessibility and poor legibility. Quoting from RedPolka.org (n.d.), we can reiterate by saying:

“There are aspects of ‘feminine’ design, then, that diminish usability on the web. Our eyes read certain fonts better, for instance, and scripty fonts are not among them. Colour, used in excess, can become a distraction for the eyes (not to mention issues of colour-blindness and contrast for various folk). The same is true of graphics.”

**Sound:**
Instead of background music, the designers chose natural sounds, such as birds singing. The result is a soft, not disturbing soundtrack, which adds significantly to the naturalistic sensation of the website.

**Mood and tone:**
The Surf website seems to be both “light” and with a caring tone, trying to express optimism and an “upbeat” overall feeling, reinforced by the pictures.

**Gillette – [www.gillettecomplete.com](http://www.gillettecomplete.com)**

![Gillette Complete Skincare website](http://www.gillettecomplete.com)

**Figure 3. Gillette Complete Skincare website.**

**Overall description:**
Gillette Complete Skincare (Figure 3) is a website aimed at a male audience and willing to convey a masculine message. For example, it includes the phrase “It’s time to face skincare like a man.” The design is oriented towards this overtly masculine mission, and it is based on male stereotypes.

**Colours:**
The colour palette is based mostly on black and grey, with inserts of light blue and electronic green. Black and dark grey in this context are associated with power, sexuality and sophistication. Blue reminds one of cleanliness, technology and freshness. Bright green is associated with technology and computers. Moreover, according to Morton (1998, 2004), blue is one of men’s favourite colours. Quoting from Khouw (n.d.):

“A review of color studies done by Eysenck in early 1940’s notes the following results to the relationship between gender and color. Dorcus (1926) found yellow had a higher affective value for the men than women and St. George (1938) maintained that blue for men stands out far more than for women. An even earlier study by Jastrow (1897) found men preferred blue to red and women red to blue.”

**Shapes:**
Rectangles and sharp shapes express solidity, order, security, logic and science, forms that can be attributed to the rational masculine world. Combining a rectangle and a triangle can communicate security and dynamism. In fact, the Gillette Complete Skincare design is based on rectangles and triangles. The page layout tends to be more symmetrical than Surf, a feature that reflects the male attitude towards rationality and order.

**Font:**
Fonts are made using graphics. Many of the fonts are in italics, with inclining lettering to express dynamism. The menu in the main box “Products – Face facts – 3 easy steps for skincare” uses a font in capital letters, which emphasizes technology and toughness.

**Sound:**
The website has no background music in general. In some sections there are limited sound effects usually “technological” sounds.

**Mood and tone:**
The Gillette website conveys energy, toughness, technology and modernity, with an overall mood and tone that tries to appeal to the traditional “masculine” image. This was definitely confirmed by our user tests.
Barbie – www.barbie.com

Figure 4. Barbie website.

Overall description:
Barbie dolls are the ultimate in feminine stereotypes, and the website (Figure 4) conforms with this image. The target audience is young pre-teenage girls and the website can be overly feminine without fear of being seen as ridiculous. Quoting from RedPolka.org (n.d.):

“But what is ‘feminine’ in web design? We could say that ‘feminine’ is frequently ornamented, not necessarily floral (though there are many extreme examples of that), and is rarely spare and minimal. It favors the figural and human over the abstract. Pastels are definitely a theme, but dramatic or extensive use of any colors might be construed as feminine.”

Barbie is very ornamented, colourful, figural and pictorial.

Colours:
Barbie.com is full of different colours, but pink in its different nuances is the main feature. As Bear (n.d.) reminds us:

“in some cultures, such as the US, pink is the color of little girls. It represents sugar and spice and everything nice. Pink for men goes in and out of style. Most people still think of pink as a feminine, delicate color.” Bear also suggests to “use pink to convey playfulness (hot pink flamingos) and tenderness (pastel pinks). Multiple shades of pink and light purple or other pastels used together maintain the soft, delicate, and playful nature of pink.”

In Barbie.com, pastels are mixed with bright shades and the overall effect is “full”, but with harmony. Even if, as noted in the Background section earlier, warm colours are
particularly troublesome as a background to web pages, Barbie.com often uses them because the overall emotional impact of the website seems to be more important than specific readability or usability.

**Shapes:**
Curved shapes are dominant in the whole website, together with illustrations and photographs. Straight lines are usually avoided; every corner is rounded or softened. The home page is heavily animated: most of the objects move either alone or when the mouse-controlled cursor rolls over them. This is to fulfil the desire of playful interaction that children exhibit when using a computer. Also notable is the lack of symmetry in the home page: Barbie is not exactly in the middle of the page and the objects are spread around in an asymmetrical and seemingly haphazard way.

**Font:**
On the Barbie website, there are many different kind of fonts, some swishy, some not. As we have seen above, there are aspects of feminine design that go against usability principles, such as *scripty* fonts or excessive use of colours. Barbie is probably not a very usable website, even if it is funny and playful. The effect of this lack of usability on its audience would be an interesting subject to study.

**Sound:**
Like colours and figures, sounds are very important to engage children. Barbie has a wide variety of sounds, from the background music to the sound effects that are triggered by clicking on an object or just by rollover, sometimes overlapping, which adds extra complexity. All the voices are feminine, reinforcing the gender orientation of the website.

**Mood and tone:**
The design is colourful and the feminine character is fashionable and young; all these elements converge in an overall sunny and cheerful atmosphere. Therefore Barbie.com is definitely bright and upbeat, emanating sharing tone to its users.
Action Man – www.actionman.com

Figure 5. Action Man website.

Overall description:
Action Man is a cartoon targeted at young boys. Its masculine features are exaggerated in the same way Barbie’s feminine stance is emphasized. The website (Figure 5) aims to express the idea of energy, fighting, muscles and dynamism. As with Barbie, in this website we can clearly distinguish the gender stereotypes that are used to maximum effect.

Colours:
All the colours tend to be “metallic” and with strong contrasts between each other. Orange is the framing colour. It is also one of the shades favoured by males. Morton (1998, 2004) reports that:

“Eysenck’s study, however, found only one gender difference with yellow being preferred to orange by women and orange to yellow by men. This finding was reinforced later by Birren (1952) who found men preferred orange to yellow; while women placed orange at the bottom of the list.” (Khouw, n.d.).

Shapes:
The triangle is the strongest shape in this website; it is so important that it overlaps content and frames it. The triangle, opposite to the circle, is a typical male shape with sharp corners, expressing force, aggression and dynamic movement. In this case the triangles also emphasize the central content of the page by directing the eyes towards it. The page tends to be symmetrical, a typical masculine feature.
Font:
Fonts are large and often in capital letters and italic, all to convey dynamism, although this results in a loss of legibility. This could be a problem also because, as reported in the Educational Issues section, usually boys tend to have worse linguistic skills than girls and have more problems in reading from a screen.

Sound:
Sounds recall the graphic style of the website. The background music is aggressive and energetic, while sound effects are metallic and technological.

Mood and Tone:
The overall mood of this website is definitely aggressive, energetic and somewhat violent. Reactions to the atmosphere vary significantly between sex and ages, with a preference by young boys, the main target audience.

Cultural Examples
In the cultural field, specific audiences are important, but accessibility by all is a core value. This implies that gender-specific websites should try not to make the other gender feel set apart. In the two following examples we will show how some elements of a feminine design can be combined with an overall neutrality.


![National Museum of Women in the Arts website](image)

**Figure 6. National Museum of Women in the Arts website.**

Overall description:
The content, both of the museum and of the website (Figure 6), is explicitly gender-related. On the other hand, the audience is not only feminine, but the most general
possible. According to this, the design is neutral and does not use any of the feminine stereotypes, as previously discussed.

**Colours:**
The dominant colours are blue, white and sand. Blue, as we have already seen, is appreciated by males and conveys the idea of trust, conservation, cleanliness and order. It is suitable for international audiences.

Morton (1998, 2004) states that if you are designing for a worldwide audience, blue is the most globally accessible colour. As a result, you can use blue for just about any kind of site, regardless of its audience, goal, or location. Blue happens to be one of the colours that is safe in almost every culture. But why is blue so globally attractive? Morton (1998, 2004) speculates that “there’s nothing on the planet that exists in isolation except the sky—that stands alone.”

**Shapes:**
The website does not make an extensive use of shapes; anyway, straight lines are common to frame navigation areas.

**Font:**
All the graphic fonts are sans-serif; the default font is Arial. This choice is very neutral.

**Sound:**
The website also respects neutrality by not using any sounds.

**Mood and tone:**
The mood is not particularly light or upbeat, but it is felt by the users to be serious and credible, partly due to its institutional colours and design.
**Fashion and Textile Museum – www.ftmlondon.org**

![Fashion and Textile Museum](image)

The Fashion and Textile Museum (FTM) was officially opened on May 8th, 2003, by Princess Michael of Kent and founder Zandra Rhodes. FTM is the first museum in the UK dedicated to contemporary fashion and textiles.

**Figure 7. Fashion and Textile Museum website.**

**Overall description:**
The content of the museum is of interest to women, even if not exclusively so. The museum is founded by a woman and the physical building is pink and orange. This choice could have led to a very feminine design (Figure 7), but in this case only some elements are feminine, while others are masculine or neutral.

**Colours:**
Orange, fuchsia and white dominate the layout. They refer to the logo and to the building more than to a specific feminine taste.

**Shapes:**
The layout is based on rectangles, which are mainly masculine. Moreover, symmetry is important, another feature of more rationalistic designers.

**Font:**
All fonts are sans-serif and neutral.

**Sound:**
As in the previous website, this too does not use any background music or sound effects.
Mood and tone:
The colours used in the home page tend to create a bright atmosphere, friendly and welcoming like the museum building. Users expressed that the geometrical layout gives the impression that the site is simple and easy to use, even beyond its real usability.

Summary
In this section, we have considered a number of websites with strong gender bias of some sort, whether through the content, design or both. We have presented brief descriptions of the overall design, colours, shapes, fonts and sounds (if any) used, together with brief comments on the overall mode and tone of the site. Readers can draw their own conclusions, but may like to try a similar exercise on a small selection of websites of their own choosing.

In the next section we consider the strongly commercial development of online gaming from the video game market, giving the potential of a community of games players. For females this may encourage a collaborative response, in males an adversarial and competitive attitude, if stereotypical lines are followed.

ONLINE GAMING

Despite growing evidence that more and more girls and women play games online and in the home, the public image of the gamer...has remained fairly resistant to change

Here come the game grrls  – H. W. Kennedy, January 5, 2004 (HERO – http://www.hero.ac.uk/)

In this section we focus on how women gamer websites use different strategies of inclusion for their communities of gamers, often reflecting social features common in online game play and supporting HCI models of social interaction (Argyle et al., 1985). Not surprisingly, these community-building strategies have evolved from a history linked to the video game market and latterly to the rise of online gaming and online-enabled consoles. Recent surveys show a marked take-up by women in what has been perceived as a male-dominated domain, namely the playing of online and computer games. For instance, the Entertainment Software Association (2003) in the U.S. tallied that half of all Americans play computer and video games, with women making up the second largest group of gamers. A US survey by Peter D. Hart Research Associates on behalf of the Entertainment Software Association reported on a random 1,048 computer or video-game players, with ±3.5% error. The summary findings are as follows (Ramirez, 2003):

- Men aged 18 and older: 38%
- Women aged 18 and older: 26%
- Boys aged 6–17: 21%
- Girls aged 6–17: 12%
Outside the US, statistics reveal comparable findings. “According to Screen Digest’s ISFE 2003 yearbook, across Western Europe female gamers make up 25.1% of the region’s total active gamers” (ELSPA, 2004). 27.2% of UK gamers are women, the second largest game playing population in Western Europe. Japan leads the international statistics in that 69.2% of women have at least one games console in the home and game play on mobile phones is particularly pervasive (ELSPA, 2004).

Rise of the Girls’ Game Movement

Before the development of gaming communities on the Internet, the ‘traditional’ market of video and console games was clearly male dominated in terms of players and designers (Cherney & Weise, 1996). The development of girls-only video games did not appear prominently on the market until the early 1990s, although in the 1980s Roberta and Ken Williams developed a series of adventure games (e.g., Mystery House) and the arcade classic Frogger (1983), which were popular with boys and girls.

In 1994, the first game specifically targeted towards girls was called “Hawaii High: The Mystery of the Tiki,” designed by Trina Roberts, a writer for Barbie Comics and designer of Wonder Woman. This game was not a success but used features that would influence the girls’ games movement, namely, more character-centred plots, friendship and social relationship activities, as well as incorporation of bright graphics (Cassell, 1998). Concurrently, Patricia Flanagan, co-owner of American Laser Games and Sheri Graner Ray, an established games designer, set up HerInteractive in 1995 to create games that particularly appealed to girls (Krotoski, 2004).

However, the scene was dominated with the launch of “Barbie Fashion Designer” which sold significant numbers of copies (600,000 in the first year) and was the benchmark for so-called ‘pink games’. Interestingly, Core Design’s “Tomb Raider” with its strong female protagonist Lara Croft came onto the market around the same time and provided further thought to assumptions about gender (e.g., post-feminist equality) and contrastingly, stereotypical rendering of the female form. Lara Croft has adapted to be more female-friendly as the games have developed subsequently, with a change in dimensions for Lara herself!

Among the challengers to both gender assumptions and the girls’ game movement itself arose from organizations of female gamers, such as Game Girls (http://www.grrlgamer.com/) who sought to confront fixed identities and take on traditional combat games as a space where they could tackle male gamers on their own terrain (Groppe, 2001; Cassell, & Jenkins, 1998).

They addressed concerns around sexism and exclusion from the games playing community itself. They did this through active participation in games seen as ‘hard core’ and they directly took on the assumption that first-person shooter games were only intended for boys and men. As Funk & Buchman (1996) and Funk (2001) observe, games that simply focus on friendship and sociality may overlook the fact that “girls are looking for games which also push them to take risks and where there is a chance to be absolutely and unequivocally dominant.”

In a parallel development, more games became available from the late 1990s that could be played on home computers and on the Internet via the web. This enabled female gamers to gain greater private access to gaming spaces and technologies. It allowed greater liberty for female gamers to become proficient in their own right and to play more
anonymously, and with less sanction in playing what may be seen as games for boys (Groppe, 2001; Griffiths et al., 2003).

Within this climate and on the heels of the underground success of *GrrlGamer*, sites, like *GameGirlAdvance.com* (Figure 8) and *WomenGamers.com* (Figure 9) were established by women for female players. *GameGirlAdvance* is a weblog and online journal that brings alternative perspectives to videogame culture with a focus on girls and women. *WomenGamers.com* has positioned itself as one of the largest women’s gaming portals on the Internet.

![Figure 8. *GameGirlAdvance* website.](Image courtesy of www.gamegirladvance.com.)
Female Gaming Sites and Social Interaction

Both GameGirlAdvance (Figure 8) and WomenGamers (Figure 9) have striking similarities in approaches to their communities, which underpin those of other women-led online gaming sites (e.g., GameGal). A key feature is their emphasis on the social role they offer users and female gamers who do not easily fit into contemporary models of play preferences.

In terms of social roles, for instance, the sites are critically aware that virtual and gaming worlds are habitually regarded as replacements of an individual’s world. In this world, individuals can undertake an alias to align their membership to certain groups. Online gaming worlds such as MUDs (multi-user dungeons) and MMOGs (Massive Multiplayer Online Games), e.g., Asheron's Call, Ultima Online, EverQuest, have paved the way toward a wider space for exploring identity and community through membership and participation (Manninen, 2001; Vogiazou & Eisenstadt, 2005).

In general, a more participatory approach in online gaming development follows an increased awareness and application of HCI models of social interaction (see Modelling HCI Interaction section above; Argyle, 1994) in which social or person-situation contexts incorporate social norms, roles, relationships and rules. Together these provide a framework that supports the development of co-operating communities and the attainment of shared goals – a ‘natural fit’ to the multiple player relationships within gaming worlds – and regardless of gender or ‘real’ world identity.

Likewise, game designers themselves have been innovating new forms of interaction, and creating paradigms for HCI. The availability of dynamic user modelling
and alternative input modalities driven by gaming applications, and the trend toward large online communities of players have created opportunities for researchers to test theories and form new models of interaction strategies.

For instance, game designer and researcher, Manninen (2001, 2003), provides an insight into categories of perceivable interaction forms available in multiplayer games by analysing the communicative and social aspects of computer-mediated gaming. These categories effectively go across and intersect with the layered framework (Figure 1) of human-human interaction. Manninen (2003) defines interaction forms as actions that can potentially be perceived by players. They can act as manifestations of interaction occurring between players, or between players and the game world, and are used to convey the actions of the player to oneself, as well as to others. Interaction forms further enable awareness of actions by offering mutually perceivable visualizations and auralizations within the game world.

In Taylor (2003), the offerings of social interaction, mastery and status, team participation, and exploration provided by MMOGs is shown particularly to support the types of activities that appeal to female gamers in online environments (Krotoski, 2004). This is not least because of the ability of the player to create and deploy an alias with relative anonymity and their subsequent alignment of this alias to a community. In MMOGs, players are also free to present themselves according to their imagination. When entering a MMOG, players choose a character and personalize it.

In an analogous manner, websites like WomenGamers incorporate personalization features and a member log-in that extend the deployment of aliases, as well as the content itself, encourages and facilitates the use of gaming nicknames for contributors to articles and blogs, for example.

Related to this, the design of a female gamers’ site reflects the composition of gaming communities, often representing a virtual diaspora, who bear different markers and names that are used to support their claim to a certain identity and assertion of a virtual self, and these can involve more elaborate structures than those belonging to established groups.

What can tie together this community of diaspora is a common set of visual information – for instance, a certain emphasis on open ‘fanzine’ formats with incorporation of associative symbols of female empowerment, notably in the form of female avatars not unlike Joanna Dark from Perfect Dark/Nintendo and Jen from Primal/SCEE, and other gamers with ‘attitude’. Although there is more evidence of targeting a young adult audience in GameGirlAdvance than WomenGamers, users have more fluid gender identities in games that are populated by both strong male and female characters.

**Designing Identity**

Female identity in both image and content seems to be constantly reinforced across the sites, however. This raises the wider question of gender association that the sites promote and on which the community is largely built. Interestingly, gender is a commonly manipulated element by gamers in gaming environments, in terms of avatars and game characters.

Taylor (2004) notes that while there is a fair amount of diversity among female gamers about what style of avatars are preferable, there seems to be a consistent message...
that they want a choice in how they look online. It is indeed possible for women to hold complicated relationships to even stereotypically gendered characters (like Lara Croft). It can be said that the relationship between an avatar and its user or agent is one of the most active areas of play and interaction among women gamers. The importance of identifying with a character is borne out by interviews with a selection of women gamers who indicated that favourite titles include ‘role playing’ games like the Final Fantasy series/Square Enix, narrative adventures like Legend of Zelda/Nintendo, and life simulations like The Sims/EA/Maxis (Krotoski, 2004).

Female gaming websites provide an additional channel for this interaction to be translated with the submission of gamers’ own created and customized avatar images, articles, online discussions and weblogs. In the August 2005 edition of WomenGamers (Figure 9), for example, gamers were invited to rank the top female avatars in online and computer games on the market, and for the same month in GameGirlAdvance (Figure 8) there was a debate on types of combat that may or may not be acceptable to young adult gamers.

Such communication tools assist further in the development of strong female identity through community dialogue and can substitute for the absence, in real game play, of equivalent strong female models or roles. Similarly, they permit users to take on an avatar (their own or others) and make sense of it through a variety of social and personal ‘stories’ beyond the gaming environment. Again the option for anonymity and the nature of interactive web facilities (e.g., chat rooms) allow users to meet relatively independently and to retain a given social identity in the process.

An elementary design principle shared in both GameGirlAdvance (Pinckard, 2003) and WomenGamers is the importance of identifying and defining the target audience and their interests, capabilities and contexts of use of the website, and not least the incorporation of appropriate tools to support this (Sørensen, 2004). Here, of course, it must be remembered that the female gamer audience is not a fixed or universal category, but can be highly variable with respect to its genres of play and/or technical interests or capabilities (Cherney & Weise, 1996; Groppe, 2001; Taylor, 2004).

Therefore the presentation layer should equally identify and take account of the issues of relevance and interest of its target audiences (Culp & Honey, 2002). The range (genres) of content or sets of functions/applications must be designed to appeal to the spectrum of interests of the female gamers being targeted (Ray, 2003). The use of up-to-date news columns, articles by a mix of well-known gamers and member contributors, and real-time communication tools on the websites would appear to fulfil some of these broad requirements.

With regard to the overall interface design, the principle of ‘less is more’ has been adopted by the two women gaming sites in question to a certain extent. The design of the entry-points or interfaces immediately seeks to do two things to optimize social interaction and identity: (1) at the presentation layer: enable community identification by active use of associative images and text and (2) at the task layer: enable participation among the targeted groups through prominent discussion areas. There is also the inclusion of a platform approach to the access and use of other applications and functions, including online channels for exchanges between users (e.g., weblogs).

These communication features, in turn, can add substantially to the potential for the sites to play an informal educative role (Powazek, 2001). As elsewhere, participants
in online communities potentially enjoy a far more strategic, precise and focused type of support than is available offline (Rheingold, 2000; Powazek, 2001). Suzie Cardwell, Director of 3RD Sense, notes that the importance of community-based content cannot be underestimated on a female gamer website (e.g., Chickstop.com) and cites that women’s tendency to seek social contact with other like-minded women finds an outlet in the forum that cannot easily be found elsewhere (Krotoski, 2004).

Perhaps more important than the type of information that these communities can exchange is the emotional support they provide for community members (e.g., novice gamers or game developers). In a community that has been historically marginalized and has needed to resort to their own adaptation of habitually stereotyped approaches to game development (Huff & Cooper, 1987; Cassell & Jenkins, 1998; Ivory & Wilkerson, 2002; Griffiths et al., 2003), women gamer websites are particularly pivotal in the fostering and support of the female gamer.

It is not surprising then that the design and tools which make up women gamer sites put an emphasis on community-centric and collaborative activities (Sorensen, 2004). They are not only intended to stimulate loyalty, attract new audiences, and mobilize informal sharing and learning, but to contribute to women gamer identities (whatever form that may take) and simply to offer environments for women to communicate about computer gaming culture from their perspective. The latter is the real challenge and raison d’être of these websites. Designers of such sites must ensure that the interfaces presented to the users help in promoting their purpose, which will include serious consideration of more sociological gender issues.

CONCLUSION

“I read recently that women had finally become more than 50% of online shoppers and that in a couple of years they would be 80%. So most web sites will be designed for women. What do the women here think of that?”

– http://9rules.com/whitespace/our_thoughts/where_are_the.php

In conclusion, there are significant differences in the preferences of males and females with respect to websites and their interfaces. A recent survey research on websites reinforces this view (Moss & Gunn, in press; Moss, Gunn & Kubacki, in press). Whether a gender-neutral design should be adopted or whether a specific gender should be targeted will depend on the precise purpose of the website in question. However, there is currently a very real gender bias towards male preferences online, perhaps partly because website designers and related decision makers are statistically dominated by males. On the other hand, the number of web surfers is much more evenly matched with respect to gender balance. Thus it is recommended that the issue is considered more seriously in the design of future web interfaces. The issue is also important for other HCI paradigms such as Virtual Reality (Vila et al., 2003), which may become more significant as interactive/networking technology and speeds improve. If this chapter influences future web interface designers even in a small way, and at least raises awareness of some of the issues, it will have been worthwhile.
Acknowledgements

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