



# USER CENTERED WEB DESIGN

Document Ver. 1.0

Resource Paper from **The Emovez UX Lab**  
February 10, 2011

**THINK!**

BEFORE YOU PRINT  
SAVE PAPER.  
SAVE ENVIRONMENT

Emovez GoGreen Initiative

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## INTRODUCTION

*In theory, the web is the ultimate user-empowering environment.  
In practice, the very opposite is often the case.*

Many web sites fail to empower users and in fact frustrate and confuse them because although they offer the promise of information, services or goods at the mere click of a mouse button, they are difficult for people to use.

Problems associated with the use of web interfaces are too often wrongly attributed to user incompetence, when in fact it is poor design that is to blame. If an error is possible, someone will make it. The designer must assume that all possible errors will occur and design so as to minimize the chance of the error in the first place, or its effects once it gets made.

Poor design is the result of insufficient focus on the users of web sites. Designing user-empowering web sites requires a user-centred approach - a philosophy and design methodology that puts the user at the centre of the design process.

### Through this document we have tried to:

- ▶ provide a definition of user-centred design
- ▶ discuss the philosophy and methodology of user-centred design
- ▶ suggest some key user-centred design principles
- ▶ consider the benefits of user-centred design

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## WHAT IS USER-CENTERED DESIGN?

### DEFINITION

User-centred design is an approach to interactive system development that focuses specifically on making web interfaces usable.

There are six aspects of usability:

- ▶ **Ease of learning**  
 The interface needs to allow users who have never seen it before to learn to use it quickly to succeed in accomplishing basic tasks
- ▶ **Efficiency of use**  
 The interface needs to be designed to allow rapid accomplishment of tasks for more experienced users
- ▶ **Memorability**  
 Casual users of the site are assisted by an interface design that they can remember how to use
- ▶ **Error minimization**  
 The interface should be designed to minimize the number and severity of errors, and allow for quick error recovery
- ▶ **Subjective satisfaction**  
 The experience of using a web interface should be a pleasant one
- ▶ **Accessibility**  
 The interface needs to be accessible to as wide an audience as possible

User-centred design is participatory, iterative and multi-disciplinary

- ▶ **Participatory** - It is based on the active involvement of users
- ▶ **Iterative** - It uses a design process involving a cycle of design, evaluation, and redesign
- ▶ **Multi-disciplinary** - A team of specialists is needed in order to provide adequate knowledge and expertise

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## PHILOSOPHY

The philosophy of user-centred design is based on two fundamental premises:

- ▶ It is based on the active involvement of users
- ▶ It uses a design process involving a cycle of design, evaluation, and redesign

### Focus on users

A user-centred approach to web design requires detailed knowledge of a site's target audience, as this provides information about user constraints and preferences on which the design must be based. The following information is required before a single line of HTML can be written.

#### Technological capacities

- What kind of computers and web browsers is your target audience using? You don't always have to make guesses about this information. Check your server logs if you're redesigning an existing site. If you're working on an Intranet site, do a staff survey to see what platform/browser combinations are being used. In cases where you are unable to determine what technologies users will have, it is safer to design for cross-platform and cross-browser compatibility, and for graceful degradation on older browsers.
- What plug-ins or special applications are your users likely to have? In general, the production of content that requires the use of special plug-ins should be avoided. If you do use multimedia formats, use those in common usage. Even then you should not assume that the user will have the required plug-in, or desire or know how to download and install it. Make sure that some text alternative or plain graphic version of the information is available.
- What kinds of Internet connections do your users have? Will they be using a modem or cable connection? Are they located in a geographical region with a low bandwidth connection to the Internet? Experts continue to advise that speed is a key factor in usability, so the general rule of thumb is to keep pages and their dependencies as small as possible.

#### Physical capacities

- A significant number of human beings have some form of colour deficiency. Unless you can rule out any of your target audience as having this condition, you need to ensure that no vital information is conveyed by use of colour alone.
- Vision impairments due to the results of ageing also need to be considered. Ensuring strong contrasts between background and text colours, and avoiding the use of distracting background images or animation will assist.
- Hearing impairment amongst target audiences is also often overlooked. An alternative should be provided for information in audio formats. For many deaf users, English is regarded as a second language and their proficiency in it varies widely. Plain and simple language should be used to convey important information, and the use of visual information also assists this audience group.

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### **Cultural context**

- Is your intended audience local or global? A range of problems for users result from designers failing to realize the global nature of most web site audiences. Some common problems include:
  - The use of culturally-specific icons or symbols
  - The use of abbreviations that may not be commonly known
  - Date formats that are country-specific (e.g. 11-01-11 might mean either November 1st, 2011 or January 11th, 2011 while writing the date in this format - November 1st, 2011 - eliminates the confusion)
- Will your audience understand the terminology used on your site? Unless your site is aimed at a specialist audience, minimize the use of jargon or terms that are specific to your profession or area of business.

### **Motivations**

- Why are users coming to your site?
- What sort of information are they likely to be looking for?
- Often marketing and other organizational concerns may determine decisions about the top level pages of a site, rendering the site less usable than if these decisions were based on information about users' motivations.

### **Habits**

- How do your users currently carry out web-based tasks?
- What kinds of navigation systems are they familiar with?
- Do they navigate using navigational elements or do they prefer to use search functions?

### **Preferences**

- How do your users want their web site to act?
- Are they a technically-savvy audience who turn off JavaScript because of potential security problems?
- Do they turn off cookies for similar reasons?
- Do they prefer a graphically rich or lean interface?
- What existing competitors' sites do they feel typify a good user experience?
- What sites do they hate using, and why?

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## Engineering Approach to Design

Design is necessarily a creative process, but user-centred design dictates that the creative process should employ engineering, or problem-solving principles.

User-centred design is a systematic approach, based on methods, principles and guidelines that are derived from experience of what works and what doesn't work when real users attempt to use a web interface to complete real tasks.

User-centred design is not about producing bland web sites. However, designers are not given a blank canvas to produce whatever they wish. User-centred design is about producing web sites that work, so designers are required to use their creative talents to produce an aesthetically-pleasing interface that also meets a range of user-centred requirements.

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## METHODOLOGY

The user-centred design methodology is characterized by:

- the involvement of users throughout the design process
- the use of an iterative design cycle

### Involvement of users throughout the design process

A user-centred design approach involves users (actual or from target audience groups) of the site in all phases of the design. There are a number of ways in which user participation can be facilitated throughout the design process.

### Iterative design cycle

Iterative design is a process where an interface is progressively developed and improved over a series of iterations, each the result of user testing and feedback. An iterative approach to web design acknowledges that web interfaces are never perfect, and can always be improved.

In its simplest form, the iterative design cycle can be said to have three phases: design, test, and redesign. These phases operate in a continual cycle (in theory that is; in practice iterations are limited by budgetary considerations) so that designs are continually evaluated and improved.

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## PRINCIPLES OF USER-CENTERED DESIGN

The following is a list of key principles for user-centred design. They should be observed as part of a user-centred design process.

### KNOW YOUR USERS

The first principle of user-centred web design is “**know your users**”

In order to provide a usable site interface, we need to know about users':

- technological capacities
- physical capacities
- cultural context
- motivations, habits and preferences

### MAKE THINGS OBVIOUS

In today's times, there is one word to describe an online user – “impatient”. The first law of usability is “Don't make me think!” This means that we should design interfaces so that their purpose and functionality is immediately obvious to users.

**A user who goes to or stumbles across a page that is part of your site should immediately know:**

- where they are
- where they can go from here
- what they can do
- how they can do it

**As a general guide, while designing a web site it should be ensured that:**

- all pages have a page title (both visible on the page, and in the text that appears between the <title></title> tags in the header of the document)
- all pages indicate the section of the site they are in
- all pages bear the company logo or site logo (and it's a good idea to make the logo a link back to the home page)
- navigation is clearly labelled and avoids the use of jargon or specialist terminology
- navigation is located in an obvious place on the page
- text for hyperlinks indicates what the link will lead to (as opposed to 'click here')
- functional elements are highly visible on the page
- functional elements are labelled in a way that indicates their function (most people don't read instructions)

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## AIM FOR A SIMPLE, CLEAN DESIGN

Many web interfaces are difficult to use because there is too much information on the page, or complexity in the design.

### As a general guide:

- eliminate unnecessary complexity in navigation or page layout
- arrange information using a visual hierarchy - more important information is larger and more prominently placed on the page
- text should be written for the web, using 'chunking', and 'inverted pyramid' style writing
- avoid the use of frames as many users do not understand how they work, and many web designers do not implement them properly

## BE CONSISTENT

Consistency is important in a number of areas on the web including navigation, page layout, and use of terminology.

### As a general guide:

- use a standard navigation style across your site
- place navigation in the same place on each page
- ensure page layout is consistent
- use the same terms to mean the same things
- use hyper linking conventions consistently

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## USE EXISTING STANDARDS

### INTERFACE STANDARDS

Although the web is relatively young, some interface standards already exist, and should be observed and never misused.

#### Hyper linking conventions

Underlined text, rollover effects on images, and clickable objects (clickability made obvious by the design of an image or the changed appearance of the cursor) are conventions that indicate hyperlinks. These conventions should not be misused. Some improper usage of hyperlinking conventions includes underlining of ordinary text or making objects clickable for visual effect only.

#### Vertical scrolling

Users expect to scroll down rather than across a page to find additional page content. Vertical scrolling is intuitive because it uses 'natural mapping'. Mapping is a term that refers to the relationship between two objects or things. Natural mapping uses physical analogies or cultural meanings to bring about immediate understanding of that relationship. On the web, page layout that requires horizontal scrolling is problematic because it is not intuitive, it fails to use natural mapping. Users may miss additional content that appears off screen to the right or left or be frustrated by the fact that they have to locate and use the horizontal scrollbar to see it.

#### Standard terms

A number of standard terms for referring to particular functions or parts of web sites already exist. For instance, it is standard to refer to the main page of a web site as the 'home page'. On some sites, alternative terms are used with the result that users need to stop and think about where such a link might lead. At times, even changing from a term like 'search' to 'quick search' can raise questions in users' minds.

## MARK-UP STANDARDS

### Logical vs. physical mark-up

HTML mark-up tags come in two basic types - logical and physical. Logical tags indicate the structure of a web document and the meaning of elements contained within it, while physical tags simply control presentation.

HTML was intended to be a structural language rather than a language to control screen layout and presentation. HTML tags were largely intended to convey semantic meaning, while style sheets were designed to control of layout and presentation.

#### As a general rule:

- logical mark-up should be used when it conveys relevant meaning. e.g. use `<h1></h1>` for marking up the main heading on your page, rather than `<font size="+2"></font>`.
- style sheets, not logical mark-up should be used to control format and presentation. e.g. do not use `<ul></ul>` for indenting text. It should only be used for unordered (un-numbered) lists.

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The reason for suggesting this usage is that not all users access your pages with a graphical browser, and logical mark-up allows meaning to be conveyed to users of text or other non-graphical browsers.

### HTML standards

The W3C (or World Wide Web Consortium) develops standards for mark-up languages for the web. One of the reasons that standards are developed, and the best user-centred reason for ensuring that pages are designed to comply with them, is that standards compliance ensures that your pages are accessible to the widest possible range of user agents (browsers, WAP-enabled phones, PDAs, and so on). It is a good idea to validate pages against the HTML standard.

### To sum up, as a general guide:

- adhere to interface standards, including the proper use of hyper linking conventions, vertical rather than horizontal scrolling, and naming conventions
- use logical mark-up to convey relevant meaning
- use style sheets to control presentation
- write documents to conform to HTML standards
- validate your pages against HTML standards

## PROVIDE FEEDBACK

Feedback is the provision of information to the user to indicate that the action they have taken has been registered by the system or is in progress. On the web, some feedback is provided by the browser. For instance, the status bar:

- indicates the progress of the page download
- indicates when a user is hovering over a link
- shows the URL when a link is hovered over

Feedback is also important when using forms to submit data or when using other online applications.

Another feedback-related issue is the use of consistent wording between navigation and page titles. If the page title uses different wording from that used in the navigation element that leads to the page, the user may be confused about whether or not they selected the right link.

### As a general guide:

- do not use design techniques that interfere with the browser status bar
- always provide feedback to users who submit data via forms
- provide feedback for other web-based functions/applications
- use page titles that are consistent with navigation titles

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## FACILITATE USER CONTROL & FREEDOM

There are two ways in which user control and freedom can be facilitated, or frustrated.

First, the browser provides forward and back keys to move forward and back through pages already viewed. It also enables the bookmarking of pages.

Second, the designer can provide or limit freedom and control in the design of a web page or web application. Building easy exit, as well as undo and redo options is highly recommended.

Unfortunately, some designers break browser controls by opening new windows and removing access to forward, back or bookmarking features. The back button can also be broken by less than careful use of JavaScript and other technologies such as Flash (Macromedia Flash).

Another particularly annoying trend is the automatic referral of users to high-end versions of the site when appropriate plug-ins are detected. Many users prefer to have the option of using a low-tech version, especially those using slower connections or located in regions where Internet bandwidth is limited.

### As a general guide:

- do not design in any way that interferes with or removes browser controls
- build user controls into applications: exit, undo, redo
- do not automatically direct users to high-bandwidth versions of pages

## DESIGN TO PREVENT ERRORS AND AID ERROR RECOVERY

As a designer one has to anticipate the kinds of errors users might make, and design in a way that will minimize their occurrence. When errors do occur, feedback should be provided to facilitate error diagnosis and recovery.

Often data input forms do not specify the fields where data is required or the format that the data is required in (e.g. the required format for phone numbers may include area or country codes, and if so, this should be explicitly stated). To add to users' frustration, many error pages do not list all data input errors so that in cases where multiple errors are made, the user is sent back and forth several times between the form and the error page.

### As a general guide:

- specify compulsory (required) data fields
- specify formats required for data
- provide complete error information
- provide plain English error messages

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## BENEFITS OF USER-CENTERED DESIGN

### ENHANCED USER EXPERIENCE

The main advantage of user-centred design is the development of an interface which is easy and pleasant for people to use.

#### **An easy-to-use web site**

- is one that people will return to
- enhances your organization's reputation
- permits further development or transfer of business functions online

### FUNDAMENTAL TO SITE EVALUATION

There are many ways in which a web site can be evaluated.

From the consumer or end-user's point of view, the following should be considered:

- Does it provide useful content?
- Does it provide a useful service?
- Is it a convenient way to achieve something that would be more difficult (or costly) to achieve by some other means?
- Does it do a better job than competing sites?

From an organizational point of view, the following has to be considered:

- Has it been an effective marketing tool?
- Has it enhanced or complemented the organization's reputation?
- Has it enhanced the organization's business or delivery of services?
- Has it enabled a reduction in operating costs by transfer of some services to the web?
- Has it succeeded in providing the user services we intended?

Without a user-centred approach to design, none of these questions can be answered with any accuracy. Users cannot evaluate a site's content or delivery of services if they cannot use the site. Organizations cannot evaluate the effectiveness of their web site in any way if they cannot rule out usability problems as a likely cause of lack of use or success.

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## OVERALL SUCCESS OF YOUR WEBSITE

A user-centred approach to web design makes an important contribution towards ensuring the success of the web site. It complements the hard work of content and service providers, by making the content accessible, navigable and usable.

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## SUMMARY

User-centred design is about designing web sites that are easy and pleasant to use. It is a philosophy that asserts that the design process must be focused on the end user, and that web design is about using creative energy to solve a range of usability problems. User-centred design is a methodology that involves the user in all phases of its iterative design cycle.

**The primary design principles of user-centred design are:**

- know your users
- make things obvious
- aim for a simple, clean design
- be consistent
- use existing standards
- provide feedback
- facilitate user control and freedom
- design to prevent errors and aid error recovery

User-centred design is crucial to the success, and the measurement of success, of all web sites.

The web is a user-empowering environment, but only in theory. A user-centred approach to design will give power and control back to users.



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