A First Approach To Design Web Sites By Using Patterns

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Abstract. This paper presents a first approach of a web design pattern language. Its main goal is to gather the experience on web design and provides a communicative tool than can be used by every stakeholder in a project. The pattern language distinguishes between three design levels: the web site, a web page and the ornamentation level. The recurring principle through the pattern language is supporting users to achieve usability improvement.

Introduction

The World Wide Web has rapidly become the dominant Internet tool, combining hypertext and multimedia to provide a network of multidisciplinary resources. It is important to make sure that every part of a Web site is useful. A user will come to a site expecting to be able to perform a particular task, or read a particular piece of information. When we are designing a Web site we want to make sure that the user can find that resource quickly and easily. If they can't find the information quickly then they may leave our site, and proceed to another site where they can find the resource. The Web is a new medium and requires a new approach [Nielsen 99].

[Shneiderman 98] commented that “It will take a decade until sufficient experience, experimentation, and hypothesis testing clarify issues” and warned that meanwhile “the paucity of empirical data to validate or sharpen insight mean that some guidelines are misleading”. Nevertheless, many sets of web design guidelines have been published. There are many [Guidelines] that can be used for improving the designing of our Web sites. Most of these recommendations for Web site designers are however not based on research but on intuition. They are based in the experience of the designer. Traditionally, interface design experiences are gathered with guidelines but patterns can be used too. The concept of a pattern language has been developed by Christopher Alexander and his colleagues in architecture and urban design [Alexander 77, 79]. In brief, a pattern language is a network of patterns of varying scales; each pattern is embodied as a concrete prototype, and is related to larger scale patterns, which it supports, and to smaller scale patterns which support it. The goal of a pattern language is to capture patterns in their contexts, and to provide a mechanism for understanding the non-local consequences of design decisions [Erickson 97].
A Pattern Language for web design

A pattern language has to have a structure of hierarchical network. So, an essential component in the definition of a pattern is the relationships with others patterns. In the diagram of the proposed pattern language (see Figure 1), arrows between patterns introduce these relationships. The pattern language distinguishes between three levels, these levels are inspired by Christopher Alexander’s pattern. His pattern language describes a highly structured collection of patterns, intended as a practical guide for architectural designers. This idea is extrapolated to web site designing by introducing patterns related with web sites, web-pages and ornamentation details.

Figure 1. Proposed pattern language to design web sites

In the following sections of this paper, each level starts with a brief summary, which introduces the patterns described in the section. The patterns in the entire collection are depicted graphically in Figure 1 and summarised at the end of this paper in the Summary section.

How could I use this collection?

The algorithm that describes how this pattern language can be used is the following:
1. Read the resumed list of patterns.
2. Scan down the list, and find the pattern, which best describes the overall scope of the project or the problem that you want to solve.
3. Read the starting pattern. Tick all of the low order patterns and ignore all the high order patterns.
4. Turn to each pattern and now tick only relevant low order patterns, if they exist else 6.
5. Keep going like this, until you have ticked all the patterns you want for your project.
6. Adjust the sequence by adding your own material where you haven’t found a corresponding pattern.
7. Change any pattern where you have a personal version, which is more relevant.
Web Site Level

This section introduces design patterns related with Web site design. These patterns are associated with common features that can be found on many Web sites and are extrapolated from another different context. The user requires know where he/she is (Welcome) and where he/she can go (Indication). The user wants to visit the Web site in a suitable way (Polyglot, Ready, Similarity).

Welcome

Motivation:
When a user arrives at a Web site, like he/she arrives at a city, town or any important building needs to know where he/she is, what can he do there, and what he need for visiting that place.

Problem:
How does the user know where he/she is?

 Forces:
• Users need know where they are
• User wants to know where they can go next
• A complex Web site can be very disorienting for users
• Users who are familiar with the structure and content of a Web site should can jump straight to the space where they want to go

Solution:
Provide a reception place where user access conditions can be evaluated. From this welcome point, user will be able to enter to Homepage and to another Indications. User’s information, such as language or monitor size should be gathered to the provision of Web site’s services to user (Ready). In its defect, the user should be informed about the best conditions for the visiting Web site or these conditions should be offered directly (Polyglot). User can find information about content (About this) and owner (Contact us) of the Web site in this page. Welcome and Homepage is the same one in many occasions.

Consequences:
Provide improvements on the navigation, functionality and feedback

Examples & implementation details: http://www.alanismorissette.com These web sites, and many others on the Web, have got a initial page where users are received. These pages have as main features their low-load time (Busy), offer the possibility to customise the language or browser properties, and provide information on who, what, when and where the user can find on the web site. Ex.: http://www.crescere.co.uk/, http://www.graffiti.ie/
**Indication (aka. Index)**

**Motivation:**
A Web site is a navigational space where users want to achieve goals, such as finding information or buying a product. In a similar way, as occurs in supermarkets, museums or important buildings users need to know where they can go and what they can do once they get there.

**Problem:**
How does the user know where he can go and what will he/she find there?

**Forces:**
- The user should know what places are available
- Doing actions accidentally may be disoriented
- Putting together a collection of objects may take time and mental effort
- The links on Web site should be organised well enough so that the user can find what’s needed

**Solution:**
*Web site musts provide the needs mechanisms (meaningful links) that allow any user to move from one place to another places.* User can be disoriented and should receive feedback information about his/her Location and has the possibility of coming back (Second chance) to a safe place (Homepage). Important links should be placed high on the page and descriptive link labels should be used (Polite) and if you use frames you should title each frame to facilitate frame identification and navigation.

**Consequences:**
Provide improvements on the functionality and navigation

**Examples & Implementation details:**
[http://www.fourthcube.com](http://www.fourthcube.com), [http://www.amazon.com](http://www.amazon.com) These pages, and others like them provide navigation information by menus, breadcrumbs, buttons or simply links. The situation or appearance of these elements of navigation information can be very varied (left, top, right, etc.). Different kinds of navigation tools can be seen in the following figures:
Polyglot

Motivation:
“The power of the Web is in its universality. Access by everyone regardless of disability is an essential aspect” (Tim Berners-Lee, Director of the W3C). Many factors should be considered: hardware, software, aesthetic, etc.

Problem:
How can the user do a useful use of the Web site and access information at your own pace?

Forces:
- The user wants easy access to information
- The user is principally doing something else, and this shouldn’t interfere with it
- The user has little or no incentive to spend time learning technical details
- The user wants full access to everything at once, even if the Web site is complex

Solution:
Speak user’s language is “design for all”[Schneiderman 98] [Constantine 99]. Kids, older or disabled people can visit our Web site and universal design techniques can be applied in the design of Web site and his services. These people must know if they are Ready. Monitor size, user’s screen resolution, connection speed and download time should be considered when you design a Web site, but font sizes and familiar fonts too (Danger). Information should be provided of a suitable manner by considering several kinds of peoples and technical features and by using Polite language.

Consequences:
Provide improvements on the functionality, language and consistency

Examples & Implementation details:
http://europa.eu.int, http://wap.uclm.es these pages has several links or buttons associated with different ways of visualisation. Basically the user can select between several languages or levels.

Since many people prefer to read printed text many web sites provide printed version of articles or papers (Print).

It’s important to keep in mind that even if you specify a particular font in your HTML code, it can’t display on your viewer’s display unless the font exists on your viewer’s hard drive. For this reason, it’s best to use common fonts such as Arial®, Times New Roman® and Courier™ New. Is important to provide a text equivalent for every non-text element (via ALT, LONGDESC or in element content). This includes: images, graphical representations of text, image map regions, animations, applets and programmatic objects, ascii art, frames scripts, images or videos. For data tables, identify row and column headers.


**Motivation:**
When an user is navigating across the Web site must know if he/she is still there or not. The Web site can be very complex and many links can be external to Web site.

**Problem:**
How does the user know that is visiting the same Web site?

**Forces:**
- Users need know where they are
- A complex Web site can be very disorienting for users
- Doing actions accidentally may be disoriented

**Solution:**
*Web site should be designed by using the same criteria: colours, fonts, navigation location and layout.* Use a single style sheet for all the pages on your site. One of the main benefits of style sheets is to ensure visual continuity as the user navigates your site, but documents should be organized so they may be read without style sheets (*Polyglot*). The user always must be informed by using a suitable way (*Polite*) where he/she is (*Location*) and where he can go (*Indication*). Offering undo/redo mechanisms is advisable (*Second chance*), so as avoiding to use disoriented components (*Danger*).

**Consequences:**
Provide improvements on the navigation, consistency and feedback

**Examples & Implementation details:**
[http://www.ibm.com](http://www.ibm.com) The implementation of this pattern can be done by using style sheets. Style sheets are a way to separate style from content in Web pages. In an ideal world, you would put all your content (e.g. text and graphics) in one place, and define how that content is laid out (the style) in another. Straight HTML mixes style with content. Style sheets allow you to modify the default attributes of many standard HTML tags. You can create a style sheet in a separate file and then link one or more web pages to it - this is called linking, amazingly enough. Or, you can embed style definitions directly into the `<head>` section of individual web pages, using the `<style>` tag - we humans call this embedding. Ex. [http://www.plop.dk/VikingPLoP/](http://www.plop.dk/VikingPLoP/)
Ready

Motivation:
You can use everything to design your Web site, but the user who wants to visit your web will have to have installed the needed plug-ins, and you should remember that you should speak your language (Polyglot).

Problem:
How does the user know that he can visit the web site without problems?

Forces:
- The user wants easy access to information
- A complex Web site can be very disorienting for users
- The user wants to have control over the actions
- The user doesn’t want to be interrupted by collateral aspects related with design

Solution:
Provide tools or needed information to visit the web site of suitable manner. Web site must detect if the user has everything needed and provide links to download places where he will get needed plug-ins. The user does not need to know technical aspects (Polite). Ensure that pages are usable when scripts, applets, or other programmatic objects are turned off or not supported. If this is not possible, provide information on an alternative accessible page (Polyglot).

Consequences:
Provide improvements on the functionality, control and navigation

Examples & Implementation details:
http://www.mercksharpdohme.com/, http://www.hp.com There are many web sites where plug-ins are required, or minimum monitor resolution is needed (Danger). Frames are not supported in other situations. The user needs know that he needs.

For best viewing of this site, I recommend a minimum of 640 x 480 monitor resolution and 16 bit High Colour. Shockwave plug-ins is required. And for those who hate frames, sorry guys! this site relies heavily on frames. If you find any part of this site is not working let me know!
**Web Page Level**

This section introduces design patterns related with Web page design. They are habitual elements and considered features when we are designing Web sites. In these hierarchical structure a **Homepage** is necessary. In some occasions, the user needs provide information then he/she must fill a form (**Form**) and always the user wants to have the control (**Busy, Second Chance**) and to visit web sites to his/her own pace (**Polite, Danger**).

<table>
<thead>
<tr>
<th><strong>Homepage</strong></th>
</tr>
</thead>
</table>

**Motivation:**
A Web site can be achieved by random way, but always must have a point of reference. When an user arrives at a Web site, like he/she arrives at a city, town or any important building needs to know where he/she is, what he can do there, and what he need for visiting that Web site. **Home Page** is an essential component of a Web site. On it questions such as: who?, what?, when? and where? Should have answer.

**Problem:**
How does the user know where the user is?

**Forces:**
- Users need know where they are
- User wants to know where they can go next
- A complex Web site can be very disorienting for users
- Users who are familiar with the structure and content of a Web site should can jump straight to the space where they want to go

**Solution:**
**Provide a starting page where the user feels like at home.** Homepage is a place where the user can go back if he is disoriented. Its layout puts important information at top (**Novelty**), includes logos (**Tagline**), search approaches (**Search**) and information contact (**Subscription, Contact us, About this**).

**Consequences:**
Provide improvements on the functionality, control and navigation

**Examples & Implementation details:**
[http://www.apple.com](http://www.apple.com), [http://www.ieee.org](http://www.ieee.org) Any Web site has a homepage. It is a specific page that introduces distinctive features. The most critical role of the homepage is to communicate what the company is, the value the site offers over the competition and the physical world, and the products or services offered. The challenge is to design a homepage that allows access to all important features without cramming them onto the page itself, too often overwhelming new users. References to homepage should be included in every pages of the web site (**Similarity**).
**Motivation:**
For many years, technical communications have stressed the need to use language that’s meaningful to readers. That this would be helpful to people seems intuitively obvious. However, a difficulty in accomplishing this may be less obvious: people differ widely in terms they choose to describe particular concepts [Evans 98].

**Problem:**
How can the user access the content of the Web page in a simple and proper way?

**Forces:**
- Users can be slowed when they must ponder the difference between similar link labels.
- There may be times when no terms are meaningful to all users of a Web site.

**Solution:**
Use the clearest and simplest language appropriate for a site’s content. Create documents that validate to published formal grammars. Associate labels explicitly with their controls (Indication). Express only one idea in each sentence (Tagline). Long, complicated sentences often mean that you aren’t clear about what you want to say. Because asking users seems to be an especially effective way to choose option names, use cards sorting, participatory design, or other methods that involve users whenever possible.

**Consequences:**
Provide improvements on the functionality, feedback, language and consistency.

**Examples & Implementation details:**
http://www.rae.es,  http://ox.ac.uk Languages often have alternative expressions for the same thing ('car' and 'auto'), and a given word can carry different senses ('river bank' vs. 'savings bank') or function as different parts of speech ('to steal'--verb; 'a steal'--noun). Because languages naturally adapt to their situations of use and also reflect the social identities of their speakers, linguistic variation is inevitable and natural. Some words can create problems for you, especially when you use them without thinking about their true meaning. The way we think and the words we use determine our reactions to life.

Hyperlinks from each chunk should clearly state where it leads when clicked. Links should include a clear, easy-to-read explanation. Avoid puns and wordplay. Make sure the link it of sufficient length for the reader to click — avoid small one-word links as these will frustrate tired surfers or those with poor eyesight. Aim to assist your readers.

On the Web, underlining should only be used to indicate that a particular piece of text is also a link. I’ve seen a lot of Web pages use underlining for emphasis, which confuses viewers when they click on the underlined text and nothing happens. For this reason, instead of using underscores for emphasis, it’s best to use bold type and/or italics.
**Busy**

**Motivation:**
Web sites are places where users can download information, images, files or applications, but this downloading can take a lot of time, create significant delays or be accomplished in different ways.

**Problem:**
How does the user know when his/her operations have finished or the finished state of them?

**Forces:**
- The user wants to know how long they have to wait for the process to end
- The user wants to know how fast the progress is being made, especially if the speed varies
- Sometimes its impossible to tell how long the process is going to take

**Solution:**
Provide feedback of the user action (sendings, loadings, downloadings, etc.) Images, files and any element that the user can download should have got information about size, so users can know how long have to wait for the download process. Images and text should be downloaded on-demand (Size).

**Consequences:**
Provide improvements on the functionality, feedback and error prevention

**Examples & Implementation details:**
http://www.google.com, http://www.acrobat.com Many Web pages needs load a plug-ing to get a correct visualisation, a progress bar is used to provide such information. Sometimes a task running within a program might take a while to complete. A user-friendly program provides some indication to the user about how long the task might take and how much work has already been done. If you don't know or don't want to indicate how complete the task is, you can use a cursor or an animated image to indicate that some work is occurring. If, on the other hand, you want to convey how complete the task is, then you can use a progress bar like this one (http://java.sun.com):

![Progress bar](image)

Sometimes, you can't immediately determine the length of a long-running task. You can show this uncertainty by putting the progress bar in indeterminate mode. In this mode, the progress bar displays animation to indicate that work is occurring. As soon as the program determines the length of the task, you should switch the progress bar back into its default, determinate mode. In the Java look and feel, indeterminate progress bars look like this:

![Indeterminate progress bar](image)
Second Chance

Motivation:
When the user is navigating on the Web site, he wants to feel the control of his/her operations. He needs to know that any operation can be cancelled and that he can return to a previous state.

Problem:
How can the user be sure of his actions?

Forces:
- Doing actions accidentally may be disoriented
- The user wants security and error prevent
- The user wants to explore and not to learn
- The user is in a hurry

Solution:
Provide elements for undo/redo, backing and clearing. These mechanisms in a Web environment consist of providing links to previous page, previous location or Homepage. In Form is necessary to provide two buttons: "submit" and "reset".

Consequences:
Provide improvements on the control, functionality and error prevention

Examples & Implementation details:
http://www.iomega.com, http://www.acrobat.com. The pages that implements this pattern has got links or buttons that provide undo command. So links to previous sections (page, up, back) or homepage are usual in any page of a web site. Reset form button in Forms (The form) is other example of using this pattern. Browsers provide this functionality too by using back button.
Form

Motivation:
The user has to provide information, usually short answers to questions.

Problem:
How can the user provide information to the web site owner?

Forces:
- The user needs to know what kind of information to provide
- Users generally do not enjoy supplying information this way
- It should be clear what is required, and what is optional
- The user is in a hurry

Solution:
Provide appropriate “blanks” to be filled in, which clearly and correctly indicate what information should be provided [Tidwell 98]. Search, Contact Us and Subscription are examples of forms. In occasions, a form fills a complete page. The user needs know if his/her submit was correctly processed (Busy).

Consequences:
Provide improvements on the functionality.

Examples & Implementation details:
http://www.iomega.com, http://www.iberia.es These pages and other pages where the user can provide information implements this pattern. An HTML form is a section of a document containing normal content, markup, special elements called controls (checkboxes, radio buttons, menus, etc.), and labels on those controls. Users generally "complete" a form by modifying its controls (entering text, selecting menu items, etc.), before submitting the form to an agent for processing (e.g., to a Web server, to a mail server, etc.)
**Danger**

**Motivation:**
There is a plethora of plug-ins for sound, animation and all kinds of things. But you can't assume that anyone is going to have them, or can use them with their particular computer set-up.

**Problem:**
How can the user visit a web site without getting confused, being interrupted or being disoriented?

**Forces:**
- Users generally have not got the plug-in that he/she needs
- It should be clear what is required to visit the Web site
- Users that can visit Web site is unknown
- Everybody is disability in one way or another

**Solution:**
**Be careful with using disoriented components.** For example, you can use readable font size, consider monitor size, use well-designed headings, limit number of frames, limit use of animated gifs, flash, applets, music, rollovers, reduce user’s workload, not use blink or marquee elements, limit maximum page size (**Size, Colour**). Use style sheets to control layout and presentation.

**Consequences:**
Provide improvements on visual clarity, control, functionality and navigation.

**Examples & Implementation details:**
The fundamental design of the Web is based on having the page as the atomic unit of information, and the notion of the page permeates all aspects of the Web [Nielsen, 00].

http://www.garbage.com, http://www.biblioteca.uclm.es are bad examples, antipatterns in this respect. Frames pose many problems, for instance, navigation does not work with frames since the unit of navigation is different from the unit of view. Frames sites are either hard or impossible for search engines to index. If you use frames, people will have a hard time finding your Web site. Frames cause printing issues on older browsers, which tend to print the frame clicked in last, or if not default to top-left, which is generally not the frame you want to print.

The BLINK and MARQUEE elements are not defined in any W3C specification and should not be used".

Internet is a great search engine, and Macromedia Flash is a great visual impact tool but search engines cannot read the text within a Flash ‘Movie’ or within any other image files like GIF’s or JPEG’s.
Ornamentation Level

This section introduces decoration features of a Web site. These features provide improvements on general usability of any Web site. They are related with using of Colour, Size, security (Secret) and providing location references (Location, Contact us) and information (Subscription, Recognize, Novelty).

Tag Line

Motivation: When you are designing a web site you should provide information about the purpose of it.

Problem: How can the user know the purpose of the web site?

Forces:
- Users are in a hurry
- Users don’t read web pages, they have a look at pages

Solution: Include a tagline that explicitly summarise what the site or company does. Its should be brief, simple and to the point. Include a short description of the site in the window.

Consequences: Provide improvements on visual clarity, functionality and feedback

Examples & Implementation details:

These pages has images or taglines that implements this pattern. A tagline is a short phrase that communicates the "who" and "why' of your Web site. The following elements create effective taglines: subject + audience + organization.

"The only known cure for Designer's Block"  

The best way to get me.

Print

Motivation: Most people read online text differently from how they read printed texts rather than reading word by word, most people quickly scan blocks of online text. When reading text on pages within a Web site, most people also move quickly among pages

Problem: How can the user get a suitable print of information?

Forces:
- Readers appreciate short chunks that can be located quickly
- Most users either save documents to disk or print them out

Solution: Provide a text version of web pages directly printable, or offer a downloadable, formatted version of the document to be printed [Lyardet 00].

Consequences: Provide improvements on functionality and control

Examples & Implementation details:

This pattern is used when content of long documents is broken up into smaller chunks and linked. Then providing one large page for printing, a file to download (.pdf , .ps, .doc) or the ability to print all of a sectioned document in one step is useful to the user.
**Subscription**

**Motivation:** Users want not to visit a web site everyday, they prefer to be informed when new products or news arrive.

**Problem:** How can the user be informed with meaningful information for him? How can the user have got access to periodic information?

**Forces:**
- User is in a hurry
- User wants to be informed

**Solution:** Provide an approach to user can book on-line by providing an email. So Web site owner can send information to registered users about **Novelties**. The user should be sure that your email address is not shared with anyone (**Secret**).

**Consequences:** Provide improvements on feedback.

**Examples & Implementation details:**

This pattern is implemented by using a simple **Form** where user usually only have to provide an email. In other occasions is necessary provide more information related with preferences of the user and your profile, so is possible provide personalised information. Unsubscribe option should be provided too.

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**Contact us**

**Motivation:** All business Web sites need to provide a clear way to contact with Web site owner.

**Problem:** How can the user get additional information on products or documents?

**Forces:**
- People like to know with whom they are doing business
- Getting company information might be the sole reason that users come to the site
- Many users want to know how is behind the service

**Solution:** Provide a **Form**, a place or a link in the web site where the user can get additional information about the web site owner and his products.

**Consequences:** Provide improvements on feedback.

**Examples & Implementation details:**

This pattern is implemented by including a page or a section where user can find contact information, in many occasions this information is included in bottom of all pages of the web site. In others cases, a form is provided to the user. This **form** contains features like a textarea or textfields in order to the user can provide his email and questions. Data provided by the user are **Secrets**.
**Search**

**Motivation:** Search is one of the most important elements of a Homepage, and it’s essential that users be able to find it easily and use it effortlessly.

**Problem:** How can the user know if a web site can provide specified information that he wants?

**Forces:**
- User wants to know if the searched information is on the Web site
- User doesn’t read web site. He/she has a look at it.

**Solution:** *Provide a search engine or overview page.* Give users an input box on the Homepage to enter search queries, instead of just giving them a link to a search page [Nielsen 02]. Search on the homepage should search the entire site default. [see Welie’s patterns 01]

**Consequences:** Provide improvements on functionality and control.

**Examples & Implementation details:**
- [http://www.paginasamarillas.es](http://www.paginasamarillas.es), [http://www.microsoft.com](http://www.microsoft.com). This pattern is implemented by providing a search form. Search forms are the user interface of the search engine. It can consist of a very simple *Form* with just a text field and a button, it can be a page and add a link to it in your navigation. Advanced search capabilities can be worth adding. An advanced search page with options for phrases, multiple fields, special collections or zones, and date ranges allows them to perform more precise searches.

![Amazon Search Form](image)

**Recognize**

**Motivation:** When a user comes back to a Web site he needs know what places he has visited, what documents he has downloaded and if there are modifications from last visit.

**Problem:** How does the user know where he/she has been?

**Forces:**
- User does not want to loose his time
- User wants to receive personalised information

**Solution:** *Keep information about user actions, visited places, logins, etc, for instance by using cookies.* Since HTTP is a non-persistent protocol, it is impossible to differentiate between visits to a web site, unless the server can somehow mark a visitor.

**Consequences:** Provide improvements on feedback and error prevention

**Examples & Implementation details:**
- [http://www.kinkos.com](http://www.kinkos.com), [http://www.americanairlines.com](http://www.americanairlines.com). This pattern is implemented by using cookies. Web cookies are simply bits of software placed on your computer when you browse Web sites, so the web site will recognise the user’s computer when he comes back to visit again. Cookies have some beneficial things. For example, when you log on or purchase online to certain sites, did you ever notice that when you return again you do not have to sign on the next time? That’s because it stored your password and id on your machine in a cookie. So user’s workload is reduced.
**Colour**

**Motivation:** Many web designers overlook the importance of colour when designing a web site. Colour should be one of your first concerns when it comes time to start your web site design.

**Problem:** How can the user access to information in a suitable way?

**Forces:**
- Web browsers can only see 256 colours
- People reading light characters on dark backgrounds for long periods reported less visual fatigue

**Solution:** *Provide information by using suitable colours in fonts, backgrounds and images.* For example, the default colours for Web page links are blue for non-visited links and purple for visited links. Ensure that foreground and background colour combinations provide sufficient contrast when viewed by someone having colour deficits or when viewed on a black and white screen. You should use yellow and red colours sparingly in your Web site itself. Only use them in areas where you want the visitor to focus on. Do not make large parts of your web site with bright colours.

**Consequences:** Provide improvements on feedback, functionality, consistency and visual clarity

**Examples & Implementation details:** [http://www.biblioteca.uclm.es](http://www.biblioteca.uclm.es), [http://www.trashclub.com](http://www.trashclub.com). Initially, one of the limiting aspects of designing for the Web can be the 216-colour palette. The idea behind the Netscape-created colour-set was to maintain a consistent appearance for Web pages viewed on a Windows, Macintosh, or Unix machine. Creating a consistent Web site, it’s best to base the site’s colours on the Websafe ones. Luckily, most HTML editors now have that palette built in. This pattern is implemented by choosing colour combinations where readability and visual clarity is improved and ensuring that all information conveyed with colour is also available without colour for example from context or markup. Backgrounds should not detract from readability. The first reference is an example of bad use of colour.

**Location**

**Motivation:** When a user arrives at a Web site, like he/she arrives at a city, town or any important building needs to know where he/she is.

**Problem:** How does the user know where he/she is?

**Forces:**
- Users need to know where they are
- A complex Web site can be very disorienting for users

**Solution:** Provide feedback information about location of the user in the web site.

**Consequences:** Provide improvements on navigation, consistency and feedback

**Examples & Implementation details:** [http://java.sun.com](http://java.sun.com), [http://www.acrobat.com](http://www.acrobat.com) This pattern is implemented by placing references in all web pages of the web site: using titles and breadcrumbs. Usually complex Web site includes a sitemap.
**Novelty**

**Motivation:** Users want to know if there are new features in the Web site. Users admit suggestions and want to know offers and promotions.

**Problem:** How can the user know novelties and latest news or suggestions of a web site?

**Forces:**
- User doesn’t read web site
- He/she has a look at it
- Users are in a hurry

**Solution:** Provide novelties of the web site in a clear and intuitive manner where users will have rapid access to new services offered by the web site.

**Consequences:** Provide improvements on functionality and navigation.

**Examples & Implementation details:**
  - This pattern is implemented by placing latest news or suggestions in an outstanding place in the Homepage.

**Size**

**Motivation:** Design for the WWW is a balancing act between the graphics “wow” and the real time “now”. The more graphically intense a site the longer it can take to download.

**Problem:** How can the user access to information in a suitable way?

**Forces:**
- With a 28.8k connection, your computer can receive, on average, 2K per second. No one wants to wait 30 seconds just to see your site logo.
- Developing fixed-size Web pages is a fundamentally flawed practice.

**Solution:** Provide information by using suitable sizes in images, fonts, and pages.
- Animations, images, long files should be provided if the user really wants it (on-demand).
- Page length, scrolling vs. paging needs, font size are important aspects.

**Consequences:** Provide improvements on control, consistency, and visual clarity.

**Examples & Implementation details:**
  - This pattern is implemented when thumbnails are used, when width and height attributes of the `<IMG>` tag are used, using standard fonts, or when large volume of information is broken into chunks and written in several pages avoiding scrolling. Organize documents so they may be read without style sheets is useful.

**About this**

**Motivation:** All business Web sites need to provide a clear way to find information about the company no matter how big or small the company is.

**Problem:** How does the user know which is the purpose of the site?

**Forces:**
- People like to know with whom they are doing business.
- Getting company information might be the sole reason that users come to the site.
- Many users want to know who is behind the service.

**Solution:** Provide a place or a link where the user can get information about the web site’s content.

**Consequences:** Provide improvements on functionality and feedback.

**Examples & Implementation details:**
  - This pattern is implemented by adding a section where information about owner of the page can be found. Normally a link to this section is situated in the Homepage.
Motivation: If user provides private information, he/she will need to have the right to expect confidentiality. Rapid advances in communication technology have accentuated the need for security in the Internet.

Problem: How can the user be sure that information which he provides is protected?

Forces:
- Users want to security
- Users do not need to know technical aspects

Solution: Provide security needed mechanisms (access and privacy) and inform to the user of security conditions and terms of use. Users should be registered (Subscription) and so access to private sections on the Web site is allowed, but only a login and password is not sufficient sometimes [Yoder98].

Consequences: Provide improvements on feedback and control

Examples & Implementation details: http://www.bankofamerica.com, http://www.cdnow.com This pattern is implemented with login form where we’ll ask the user for their username and password by using php or asp. But unless your form is located on a secure server, the information is transmitted in clear text, and encryption won’t occur until the php script runs.

Include links where users can read web site Privacy Policy Statement | Terms of Use
**Summary**

The following tables summarise the patterns in this pattern catalogue for reference purposes. These patterns could be integrated on a methodology like a checklist to develop user interfaces like IDEAS [Lozano 01]. There are patterns of requirements, like these, that can be used in beginning of an usability-based iterative life cycle. So patterns can be used to improve a participatory design, evaluate web site under usability criteria and facilitate communication between stakeholders involved in Web site developing.

<table>
<thead>
<tr>
<th>Problem</th>
<th>Solution</th>
<th>Pattern name</th>
</tr>
</thead>
<tbody>
<tr>
<td>How does the user know where he is?</td>
<td>Supply a reception place where conditions of user access to web site can be evaluated</td>
<td>Welcome</td>
</tr>
<tr>
<td>How does the user know where he can go and what he will find there?</td>
<td>Provide meaningful links to the different pages of the web sites</td>
<td>Indication</td>
</tr>
<tr>
<td>How can the user visit the web site at his own pace?</td>
<td>Provide information of a suitable way by taking into account users</td>
<td>Polyglot</td>
</tr>
<tr>
<td>How does the user know that he is in the same web site?</td>
<td>Provide an uniform aspect of the web site (colours, sizes, distribution, etc.)</td>
<td>Similarity</td>
</tr>
<tr>
<td>How does the user know that he can visit the web site without problems?</td>
<td>Provide tools or information needed to visit the web site of suitable manner</td>
<td>Ready</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Problem</th>
<th>Solution</th>
<th>Pattern name</th>
</tr>
</thead>
<tbody>
<tr>
<td>How does the user know where he is?</td>
<td>Provide a reference point of the web site</td>
<td>Homepage</td>
</tr>
<tr>
<td>How can the user access the content of the Web page in a simple and proper way?</td>
<td>Provide information by using a simple language and jargon is avoided</td>
<td>Polite</td>
</tr>
<tr>
<td>How does the user know when his operations have finished or the finished state of them?</td>
<td>Provide feedback of the user action (sending, loadings, downloading, etc.)</td>
<td>Busy</td>
</tr>
<tr>
<td>How can the user be sure of his actions?</td>
<td>Provide elements for undo/redo, backing and clearing</td>
<td>Second chance</td>
</tr>
<tr>
<td>How can the user provide information to the web site owner?</td>
<td>Provide appropriate “blanks” to be filled in, which clearly and correctly indicate what information should be provided</td>
<td>Form</td>
</tr>
<tr>
<td>How can the user visit a web site without getting confused, being interrupted or being disoriented?</td>
<td>Be careful with using disoriented components (frames, animated gifs, floating, windows, banners, applets, flash, etc.)</td>
<td>Danger!</td>
</tr>
<tr>
<td>Problem</td>
<td>Solution</td>
<td>Pattern name</td>
</tr>
<tr>
<td>------------------------------------------------------------------------</td>
<td>--------------------------------------------------------------------------</td>
<td>--------------</td>
</tr>
<tr>
<td>How can the user know the purpose of the web site is?</td>
<td>Provide a slogan or image that identifies the web site and its purpose</td>
<td>Tag Line</td>
</tr>
<tr>
<td>How can the user get a suitable print of information?</td>
<td>Provide information on several ways and formats and give the possibility of printing or downloading wide documents</td>
<td>Print</td>
</tr>
<tr>
<td>How can the user be informed with meaningful information for him?</td>
<td>Provide a Form where the user can get information that he wants automatically</td>
<td>Subscription</td>
</tr>
<tr>
<td>How can the user request for additional information about the content of the web site?</td>
<td>Provide a Form, a place or a link in the web site where the user can get additional information about the web site owner and his products</td>
<td>Contact us</td>
</tr>
<tr>
<td>How can the user know if a web site can provide the information he wants?</td>
<td>Provide a search engine or overview page</td>
<td>Search</td>
</tr>
<tr>
<td>How does the user know where he/she has been?</td>
<td>Keep information about user actions, visited places, logins, etc.</td>
<td>Recognize</td>
</tr>
<tr>
<td>How can the user access to information web site in a suitable way?</td>
<td>Provide information by using suitable colours in fonts, backgrounds and image.</td>
<td>Colour</td>
</tr>
<tr>
<td>How can the user access to information web site in a suitable way?</td>
<td>Provide information by using suitable sizes in images, fonts, and pages</td>
<td>Size</td>
</tr>
<tr>
<td>How can the user be sure that information that he provides is protected?</td>
<td>Provide security mechanisms (access and privacy) needed to protect user data and the web site and inform to the user of security conditions</td>
<td>Secret</td>
</tr>
<tr>
<td>How can the user know novelties and latest news of a web site?</td>
<td>Provide suggestions and news of the web site in a clear and intuitive manner</td>
<td>Novelty</td>
</tr>
<tr>
<td>How can the user know where he is, or what is the section that he is visiting?</td>
<td>Provide feedback information about location of the user in the web site</td>
<td>Location</td>
</tr>
<tr>
<td>How can the user get additional information about web site owner?</td>
<td>Include a link to an “About Us” section</td>
<td>About this</td>
</tr>
</tbody>
</table>

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References


