MiLE+

(Milano-Lugano Evaluation method)

Library of Technical Heuristics

Index

CONTENT

Back to index

1a. CONTENT HEURISTICS

The content level analyzes the quality of the content (in term of efficacy of the communication) and it allows for verifying if the contents and their structure correspond with the expectations of the users.

The goal of the content heuristics is to verify the "technical" quality of the content presented in web applications.

Feature	**Text**
Problem	**Accuracy**
Explanation	The accuracy states if a text describes adequately the referenced world, and if it is consistent in itself.
Problem	**Currency**
Explanation	The electronic communication over the web is supposed to be delivered in the precise moment the reader accesses it; thus the offered content must be current as the addressee perceives it, or must clearly show when it was published and the time scope of its validity.
Problem	**Coverage**
Explanation	The coverage defines the borders of the topics covered by the given website. It must be clear what the text is speaking about and what it is supposed to be covered.
Problem	**Content objectivity**
Explanation	The content objectivity indicates the commitment of the sender with respect to the conveyed content. For example, it must be clear if a message is an advertising or not (if the sender is paid to say something, I do not think that he must be really convinced of what he is saying…).
Problem	**Authority**
Explanation	Authority could be seen under two respects: adequacy of the author to the text (the competence of the author) and adequacy of the author to the reader (the goodwill predisposition of the author towards the reader). The author could be either a person or an institution.
Problem	**Conciseness**
Explanation	People rarely read Web pages word by word: they prefer to read on the screen few lines (15-25 lines). In this sense, conciseness is one of the most important aspects of the art of web-writing. For this reason it is very important to write an effective "short" and concise text.

Feature	**General Communication quality (text, images, …)**
Problem	**Text errors**
Explanation	The written text should not present grammatical errors.
Problem	**Multimedia consistency (images, audio, videos…)**
Explanation	All the multimedia files must be consistent with the subject of the page.

Open set: other may be added, according to the application domain and specific features.

Back to index

1b. CONTENT ACTIONS

How to use Content Heuristics

The purpose of this document is to explain in an extensive way how to find the usability problems for every content usability feature and to provide a step-by-step action guide for detecting the different problems.

Feature	**Text**
Problem	**Accuracy**
Action	1. Read carefully the text and verify if it: a. describes adequately the referenced world; b. is consistent in itself; c. does not contain errors of any kind.
Problem	**Currency**
Action	1. Try to understand if the text is update or not: a. find the date of the text publication; b. if the date is not reported, try to find other references that could help you to understand the period of publication.
Problem	**Coverage**
Action	1. Read carefully the text and try to answer these questions: a. is it clear what the text is speaking about? b. what it is supposed to be covered?
Problem	**Content objectivity**
Action	1. Read carefully the text and verify if it is clear the commitment of the sender. Try to understand what type of message you are reading: a. is it a comment? b. is it advertising ? c. is it an investigation about a topic? d. …
Problem	**Authority**
Action	1. Reading the text verify: a. the adequacy of the author (single or institution) to the text (the competence of the author); b. the adequacy of the author to the reader; c. if exists a lack of identification to the reader (responsible of its publications).
Problem	**Conciseness**
Action	1. Count the number of lines of the text (over 20-25 are too much); 2. If the text is short enough: a. verify if you have understood the main topic presented; b. verify if exists the possibility to download the extensive version of the text (in the case of articles, presentations, … it is useful to allows the user to download the complete version in .PDF format).

Example

www.cnn.com

Currency ❶**:** in this example is posted the day of publication of the article. This allows the user to know if the article is updated or not.

Coverage: only reading the introduction of the article it is clear the topic it is speaking about.

Authority ❷**:** CNN & REUTERS are reliable sources. Even if the name of the journalist does not appear, the authority is certified.

Conciseness: in many cases the articles published in CNN.com are to long: however, the application offers an easy to access "Story tool" that allows the user to print immediately the article or to bookmark the page in an external repository (❸). The only lack, from the user's perspective, is that it is not possible to download the article in .pdf version.

Feature	**General Communication quality (texts, images, flash animations…)**
Problem	**Text errors**
Action	1. Read carefully the text and verify that it not contain any grammatical error (you can also, for example, copy and paste the text in a word processor and use the auto-correction tool).
Problem	**Multimedia consistency (images, audio, videos…)**
Action	1. Verify if the multimedia files used for presenting a topic are integrated in a consistency way (e.g. if the text speaks about racism it should be integrated with an image(s), videos, flash animation(s) … that are related to this topic).
Example	 www.cnn.com In this example, the article does not present any error and the image used is strictly connected to the topic.

Open set: other may be added, according to the application domain and specific features.

NAVIGATION

Back to index

2.a NAVIGATION HEURISTICS

Within the navigational dimension of a web application there are two basic aspects that could be analyzed: on one hand the different ways that can be used by a user to reach a specific piece of information; on the other hand, the connections for passing from a content to another content.

This document presents a number of navigational features and for each feature some usability heuristics are described.

The document is divided into three parts:

1. *Basic navigational heuristics;*
2. *Advanced Navigation Heuristics I;*
3. *Advanced Navigation Heuristics II- Navigation Patterns.*

1. BASIC NAVIGATION HEURISTICS

Feature	**Navigation within a topic** (information object, entity)
Problem	**Segmentation**
Explanation	The different information about a topic could be segmented in different pages. For example, if we consider a museum website and the topic *"Author of the painting"*, this topic could be fragmented in different pages (e.g. Biography, Events of his live, More detailed info…). From a navigational point of view, it is important that the user might understand which pages belong to the topic and how the navigation within these pages works.
Problem	**Orientation clues**
Explanation	Within the navigation in a topic it is very important that the user can understand immediately his position within the topic (e.g., "You are in Biography").
Problem	**Accessibility of different pages**
Explanation	It is always essential that all the pages of a topic are easy to access in few clicks.

Feature	**Navigation within a Group of topics** (collection, set of information objects)
Problem	**Introduction list**
Explanation	The introduction list is the starting point for the navigation to a specific topic (e.g. from *paintings of 16th century* to *Venus and Adonis*), therefore it should be clear the strategy used for organizing the list. This strategy could affect the navigation of the user (e.g. if the introduction list is composed of 50 elements organized casually, the user could have some problems for identifying the elements in which he is interested).
Problem	**Orientation clues**
Explanation	It is always important that the user can understand which group of topic s/he is browsing.
Problem	**Accessibility of topics**
Explanation	It should be clear how to get an overview of all topics of the group (how many? If not, which?) and easily reach them.

Feature	**Navigation within a transition (Navigation between topics)**
Problem	**Transition list**
Explanation	The transition list allows the user to navigate across relevant relation between topics that are semantically connected (e.g. from a specific cloth to a particular accessories, the user has to go through a list of accessories); therefore it should be clear the strategy used for organizing the list. This strategy could affect the navigation of the user (e.g. if the transition list is composed of 20 elements - e.g. 20 accessories - randomly organized, the user could have some problems for identifying the elements in which he is interested).
Problem	**Orientation clues**
Explanation	It is always important that the user might understand that s/he is browsing through a transition/relation between two different topics.
Problem	**Accessibility of target**
Explanation	When browsing from a topic to another topic semantically connected, it is basic that the user accesses easily to the target topic.

Feature	**Overall Navigation**
Problem	**Landmarks**
Explanation	The access to the main sections of a web site is given by a number of landmarks. Using the landmarks the user can access easily and quickly all the macro-sections of the application. Therefore, the landmarks should be well highlighted in every page.
Problem	**Consistency**
Explanation	All the web applications have a general navigation architecture that supports the navigation of the user. This navigation has to be consistent among the different parts of the application. In this sense, it is very important that this "general" architecture emerges in a satisfactory way: the user has to comprehend how the general navigation works.
Problem	**Accessibility**
Explanation	Accessibility refers to ensuring that content is accessible, ie. ensuring that content can be navigated and read by everyone, regardless of location, experience, or the type of computer technology used.

Feature	**Tree Navigation**
Problem	**Orientation**
Explanation	Different websites are designed with a tree structure. In this site, the orientation of the user become fundamental both when the user explores a branch (section) of the tree and when he passes from a branch (section) to another. The user should be aware when a change of context happens.
Problem	**Backward navigation**
Explanation	When the user navigates within a tree (in particular when he passes from a section to another) one of the most difficult things to manage is related to the navigation to the previous visited pages. The application should support this action without the use of *back functionality* offered by the browser.
Problem	**Depth anticipation**
Explanation	Often the "tree architecture" of websites is very complex. For this reason, the user could have some problems to have a synoptic both of the website and of each branch.

Open set: other may be added, according to the application domain and specific features.

2. ADVANCED NAVIGATION HEURISTICS I

Feature	**Navigation within a Kind of Topic (Multiple topic)** (information object, entity type)
Problem	**Consistency**
Explanation	The kind of topic (or "multiple topic") is a generic category of topics of interest for the user. The kinds of topics identify the core content of the application. Therefore, all the topics belonging to a kind of topic (e.g. kind of topic *"painting"* → topic: La Gioconda, the Creation of Adam, The return of the prodigal son …) should have the same structure (the same pages, the same navigational strategy…): each topic should be recognizable as an exemplar of a kind.
Problem	**Segmentation**
Explanation	The different pieces of information about a kind topic (and related topics) could be segmented in different pages. For example, if we consider a museum website and the topic *"Author of the painting"*, this topic could be fragmented in different pages (e.g. Biography, Events of his live, More detailed info…). From a navigational point of view, it is important that the user would understand which pages belonging to the topic and how the navigation within these pages works.
Problem	**Orientation clues**
Explanation	Within navigation in a topic it is very important that the user can understand immediately his position within the topic (e.g., "You are in Biography").
Problem	**Accessibility of different pages**
Explanation	It is always essential that all the pages of a topic are easy to access in few clicks.

Feature	**Navigation within a Group of groups of topics** (collection, set of information objects)
Problem	**Introduction list**
Explanation	The introduction list of a group of groups of topics is the starting point for the navigation to a group of topics (e.g. from *paintings by historical period* to *paintings of 16th*), therefore it should be clear the strategy used for organizing the list. This strategy could affect the navigation of the user (e.g. if the introduction list is composed of 10 elements randomly organized, the user could have some problems for identifying the elements in which he is interested).
Problem	**Orientation clues**
Explanation	It is always important that the user would understand which group of group of topics he is browsing.
Problem	**Accessibility of group of topics**
Explanation	The navigation from the introduction list to the different groups of topics should be efficient and, therefore, each group of topics should be reached in few clicks.

Feature	**Backward navigation** (Reference to the past pages or actions)
Problem	**"Go back"** (Note: do not use the back button provided by the browser because the browser is an external application and so its use could not aligned with website behaviour)
Explanation	Some applications offer "go back" functionality allowing the user to go to the previously visited pages. The effect of this "go back" should be take me to the page I just visited before the current one. Be aware that if I reach a page from two different paths the go back should take me to the actual page I come from.
Problem	**History** (Note: do not use the back button functionality provided by the browser because the browser is an external application and so its use could not aligned with website behaviour)
Explanation	The history mechanism allows the user to verify which the visited pages are. The History should support the backtracking of past actions or pages.

Open set: other may be added, according to the application domain and specific features.

3. ADVANCED NAVIGATION HEURISTICS II – NAVIGATION PATTERNS

Feature	**Guided-tour navigation**
Problem	**Orientation clues**
Explanation	The guided-tour provides to the user an "easy-to-use" access to a small group of objects, assuming that user has no reason (or is not able) to select one of them. Considering that the guided-tour consists of a sequence of links among different objects (e.g. topics, pages…) the orientation becomes fundamental for the success of the user navigation (e.g. "you are browsing the photo 10 of 20").
Problem	**Control**
Explanation	The user has to control the navigation through a guided-tour: he should be able to stop, restart reset… the navigation.
Problem	**Navigation strategy**
Explanation	The guided-tour is one of the possible navigation strategies; therefore it is very important to think very well to the goal of the navigation before implementing a guided-tour. Normally, the guided-tour is used for didactical purposes (e.g. a guided-tour of the 20 most important paintings of 16th century) or for promotional reasons (e.g. a tour for presenting the new features of a product).
Problem	**Topology**
Explanation	The order of the elements in a guided-tour is crucial for the success of this navigation strategy.

Feature	**Index navigation**
Problem	**Orientation clues**
Explanation	The index-navigation provides a fast access to a group of objects, for users who are interested to one or more of them, and are able to make a choice. For this reason the user should understand immediately that the object in which he is interested belongs to a specific group of objects.
Problem	**Control**
Explanation	The user has to control the navigation both from the starting index to each element of the index and to go back from one element to the index.
Problem	**Navigation strategy**
Explanation	The index navigation is one of the possible navigation strategies; therefore it is very important to think very well to the goal of the navigation before implementing index navigation (e.g. a photo gallery could be implemented with an index navigation).
Problem	**Topology**
Explanation	The order of the elements in an index navigation is crucial for the success of this navigation strategy.

Feature	**All-to-all navigation**
Problem	**Orientation clues**
Explanation	The all-to-all navigation allows the user to navigate from one page to each other.
Problem	**Control**
Explanation	The user should have the possibility to select every pages linked with the all-to-all navigation.
Problem	**Navigation strategy**
Explanation	The index navigation is one of the possible navigation strategies; therefore it is very important to think very well to the goal of the navigation before implementing an al-to-all navigation.
Problem	**Topology**
Explanation	The order of the elements in an all-to-all navigation is crucial for the success of this navigation strategy.

Open set: other may be added, according to the application domain and specific features.

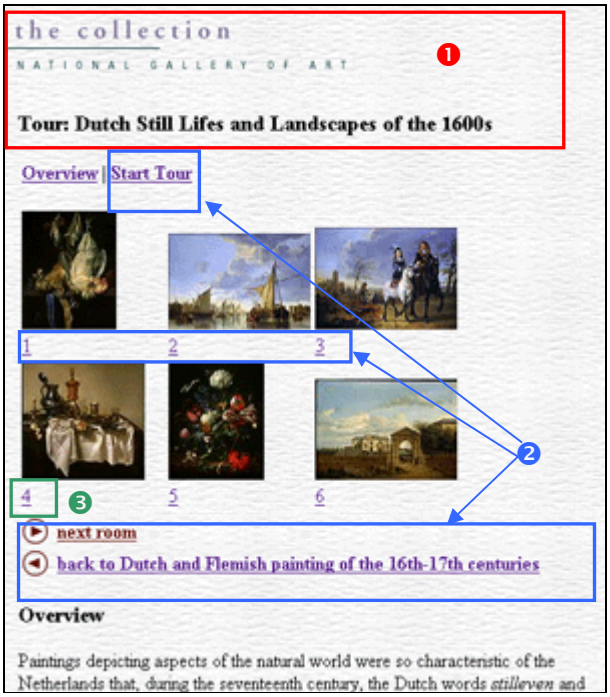
Back to index

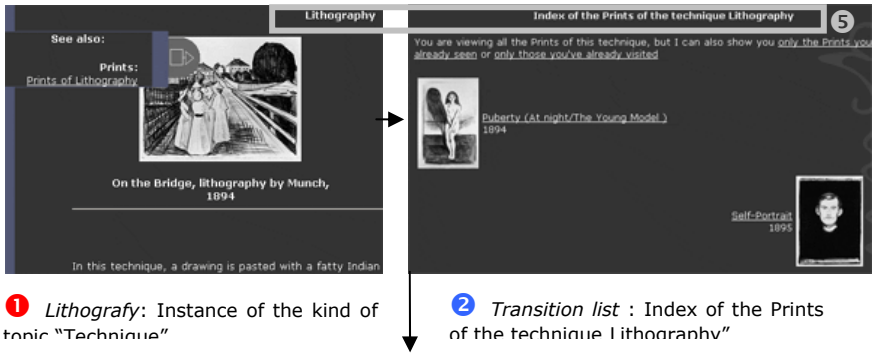
2.b NAVIGATION ACTIONS

How to use Navigation Heuristics

The purpose of this document is to explain in an extensive way how to find the usability problems for every navigational usability feature and to provide a step-by-step action guide for detecting the different problems.

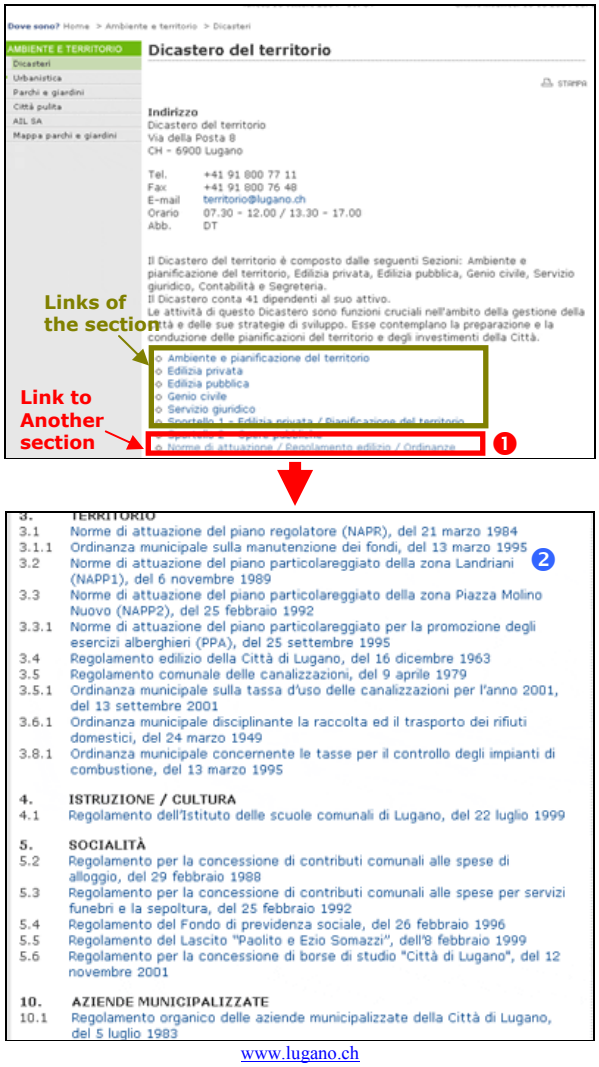
Feature	**Navigation within a Topic** (information object, entity)
Problem	**Segmentation**
Action	1. Identify an instance of topic of the website (e.g. the BMW 3 Series Coupé); 2. Try to understand in how many pages the topic is segmented (e.g. the BMW 3 Series is segmented in 5 pages/sections).
Problem	**Orientation clues**
Action	1. Identify an instance of topic of the website (e.g. the BMW 3 Series Coupé). 2. *Path visibility(where I can go?):* Navigate from the home page to the instance of the selected topic and try to understand the path engaged (where I was?) and/or the paths that it is possible to engage; 3. *Status visibility (where I am?):* Navigate randomly within the topic and try to understand which page is browsing -; 4. *Context visibility:* Navigate randomly within the topic and try to understand the context you are browsing (e.g. the design features of a the BMW 3 Series) .
Problem	**Accessibility of different pages**
Action	1. Identify an instance of topic of the website (e.g. the BMW 3 Series Coupé); 2. Try to navigate from one page to the others and count the number of clicks for accessing these pages.
Example: Instance of topic BMW 3 Series.	 www.bmw.com **Segmentation** ❶**:** In the case of the BMW 3 Series is clear that the topic is divided into 5 main pages/sections: "Introduction", "Highlights", "Multimedia gallery", "Models and data sheets", "Catalogue". In some cases, these pages/sections are also divided in sub-pages or sections (e.g. Highlights is divided into "Design", "Engines", "Chassis", "Safety"). **Orientation clues** ❷**:** It is clear both the path engaged (from Home page > Products > Highlights > Design) and the page we are browsing (Design). **Accessibility of different pages:** Once reached the BMW 3 Series all the pages of the topic are very accessible in few clicks.

Feature	**Navigation within a Group of topics** (collection, set of information objects)
Problem	**Introduction list**
Action	1. Navigate from the home page to a group of topics (e.g. from the homepage of the NGA web site– National Gallery of Art – to "Dutch Still Lifes and Landscapes of the 1600s"); 2. Verify if it is understandable the reason why these instances of topics are presented within the group of topics; 3. Try to understand the reason why of the order of the topics instances (e.g. the paintings are organized from most to the less important).
Problem	**Orientation clues**
Action	1. Navigate from the home page to the group of topics and to the group of topics to the instance(s) of topic; 2. Try to understand the path engaged (where I was?) and/or the paths that it is possible to engage (where I can go?) – *Path visibility*; 3. Try to understand which page is browsing - *Status visibility* (where I am?); 4. Try to understand the context you are browsing (e.g. the *paintings of 16th century*).
Problem	**Accessibility of topics**
Action	1. From the home page navigate to an introduction list (e.g. *paintings of 16th century*) and try to access to some instances of topics; 2. During this navigation count the number of clicks necessary to reach the instances of topics.
Example: Group of topics "Dutch Still Lifes and Landscapes of the 1600s"	 www.nga.gov **Introduction list:** Reading the text (Overview) it is possible to understand that all the paintings presented in this group of topics are related to the Dutch Lifes. Besides the web site offers a widening on this group of topics. At the contrary it is not explicit the reason why of the order of these paintings (e.g. it should be clear if they are organized from the most to the less important painting). **Orientation clues:** Navigating from the home page to the group of topic is always present the reference to the collection and to the group of topics (collection) we are browsing (1). In addition different orientation clues allows to understand the path that it is possible to engage (2) and the context we are browsing. **Accessibility:** The accessibility to each topic is not perfectly implemented. In fact, if we clicks on the image (3) we go directly to the painting selected, but clicking the number under the images we go to the "Captions" at the end of the page. There is no consistency in accessibility of the topics.

Feature	**Navigation within a Transition (Navigation between topics)**
Problem	**Transition list**
Action	1. Navigate from an instance of kind of topic to another instance of another kind of topic (e.g. within the MunchundBerlin web site – from the "lithography technique" to the painting called "Puberty"); 2. Within the transition list verify if it is understandable the reason why these instances of topics are presented; 3. Within the transition list try to understand the reason why of the order of the topics instances (e.g. the paintings are organized from most to the less important). 4. Clicking on an instance of the transition list, verify if the target is correctly reached.
Problem	**Orientation clues**
Action	1. Navigate from an instance of kind of topic to another instance of another kind of topic (e.g. within the MunchundBerlin web site – from a technique to a painting created with this technique); *2.* Try to understand which page is browsing (where I am?) - *Status visibility*. a. Verify if you understand when you reach the transition list; b. Verify if you understand when you reach the target of the relation. 3. Try to understand the context you are browsing - *Context visibility:* a. Verify if you understand the context of the transition (e.g. "Index of the Prints of the technique Lithography"); b. Verify if you understand the context of the target of the relation (which is the topic reached).
Problem	**Accessibility of target**
Action	1. Starting from an instance of kind of topic (e.g. the "lithography technique") counts the number of clicks necessary for reaching another instance of another kind of topic that are semantically connected to the source (e.g. the painting called "Puberty").
Example: From "lithography technique" to "Puberty painting"	 www.munchundberlin.org **Transition list:** within the transition list all the prints realized with the lithography technique are organized from the less to the most recent. **Orientation clues:** navigating through this relation is always clear both the page we are browsing (the status is given by the title of the section 4) and the context (that is given by the main title of the page 5). **Accessibility of target:** from the topic Lithography it is possible to reach the topic target with only two clicks.

Feature	**Overall Navigation**
Problem	**Landmarks**
Action	1. Identify the main landmarks of the website; 2. Using the landmarks try to navigate from one section to the others: once you reach a new section verify if the landmarks are always present; 3. Localize the "service" landmarks (e.g. "privacy policy") 4. Using the "service" landmarks try to: a. navigate from one "service section" to the other "service sections"; b. navigate from one "service section" to one of the main sections (verify if the main landmarks are always present).
Problem	**Consistency**
Action	1. Navigate randomly or taking into account a series of tasks/scenarios (you have to create one or more scenarios); 2. Try to sketch in a formal or semiformal way the main navigation architecture of the website. 3. Navigate once more in the website and verify that the navigational architectural schema is implemented in a consistent way.
Problem	**Accessibility**
Action	1. Create one or more scenarios (define task(s)/goal(s) –e.g. Find information about the new book of John Grisham); 2. Try to achieve the goal(s) of the scenario(s); 3. Count the clicks necessary for achieving the goal(s).
Example: Overall Navigation of Amazon (Books sections)	 www.amazon.com **Landmarks:** the Books' section of AMAZON has a number of landmarks (1) always present when the user browses this main section; but among them two are not sections of Books ("Magazine", "Corporate Accounts"). In fact, if we are in the sub section "Bestsellers" and we click on "Magazine" we reach another section from which we can not come back directly to "Bestsellers". Besides, AMAZON presents a number of "high-level" landmarks useful for accessing the main functionality of the website (e.g. "View cart", "Wish list"…). AMAZON proposes also different "service landmarks" in every section of the web site (3). **Accessibility:** in general, using different navigational paths, the content (e.g. the customer reviews of a book) are easy to access in few clicks.

Feature	**Tree Navigation**
Problem	**Orientation**
Action	1. Navigate within the website and try to verify: a. if the internal links leading to other sections are clear; b. if, passing from one section to another, orientation clues are given; c. if in each page orientation clues are given (even if you stay always in the same section).
Problem	**Backward navigation** (Note: do not use the "go back" functionality provided by the browser)
Action	1. When you reach a page try to navigate back (if this functionality is available) and verify if you reach exactly the previous page.
Problem	**Depth anticipation**

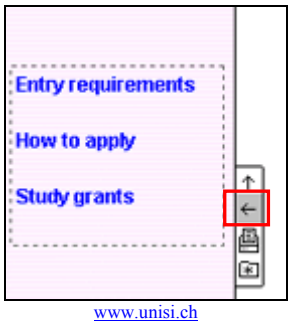
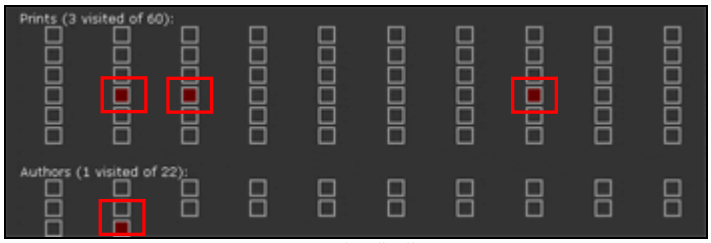
Action	1. Navigate randomly or take into account a scenario in the website and try to answer these questions: a. Did you know how many branches (sections) has the website? b. Did you know how much is deep every branch?
Example	 www.lugano.ch Navigate through the city portal of Lugano sometimes it happen that there are links (1) that allow to navigate from one section to another. The problem is that the user does not understand the difference between links leading to pages of the main section and links to other sections. Besides, when the user selects one of these links between sections he reaches pages without orientation clues (2).

Open set: other may be added, according to the application domain and specific features.

ADVANCED NAVIGATION HEURISTICS I

Feature	**Kind of Topic (Multiple topic) Navigation** (information object, entity type)
Problem	**Consistency**
Action	1. Select a number of topics (instances) (4 or 5); 2. Identify a general navigation strategy and the high-level structure of the kind of topic: a. Sketch (in an informal way) the navigation structure of the first topic (e.g. BMW Series 3 Coupé) – In how many pages/nodes the topics is divided; How the navigation works? b. Take the others topics (e.g. Series 5 Touring, Series 3 Sedan, Series 6 Convertible …) and verify if it exist a navigation consistency among the topics.
Problem	**Segmentation**
Action	1. Identify an instance of topic of the website (e.g. the BMW 3 Series Coupé); 2. Try to understand in how many pages the topic is segmented (e.g. the BMW 3 Series is segmented in 5 pages/sections). 3. Verify if al the topics have this segmentation (see Consistency – Action 2). Note: if you has already verify the Consistency you can use the results obtained (e.g. the sketch of the navigation structure) for verify the segmentation.
Problem	**Orientation clues**
Action	1. Identify an instance of topic of the website (e.g. the BMW 3 Series Coupé); 2. Navigate from the home page to the instance of the selected topic and try to understand the path engaged (where I was?) and/or the paths that it is possible to engage (where I can go?) - *Path visibility*; 3. Navigate randomly within the topic and try to understand which page is browsing - *Status visibility* (where I am?); 4. Navigate randomly within the topic try to understand the context you are browsing (e.g. the design features of a the BMW 3 Series) - *Context visibility.*
Problem	**Accessibility of different pages**
Action	1. Identify an instance of topic of the website (e.g. the BMW 3 Series Coupé): for identify a topic you can create a scenario (define goals, tasks); 2. Try to navigate from one page to the others and count the number of clicks for accessing these pages.
Example: Kind of topic "BMW Auto Model"	 www.bmw.com **Consistency & Segmentation** ❶**:** In the case of the BMW 3 Series is clear that the topic is divided into 5 main pages/sections: "Introduction", "Highlights", "Multimedia gallery", "Models and data sheets", "Catalogue". In some cases, these pages/sections are also divided in sub-pages or sections (e.g. Highlights is divided into "Design", "Engines", "Chassis", "Safety"). This structure (with little differences) is used among all the different BMW models. The navigation is consistency among all the BMW Models: from a section (e.g. Highlights) it is possible to navigate both to the other sections (e.g. "Introduction", "Highlights" …) and to subsections. **Orientation clues** ❷**:** It is clear both the path engaged (from Home page > Products > Highlights > Design) and the page we are browsing (Design). **Accessibility of different pages:** All the pages of the topic BMW 3 Series are very easy to access with few clicks.

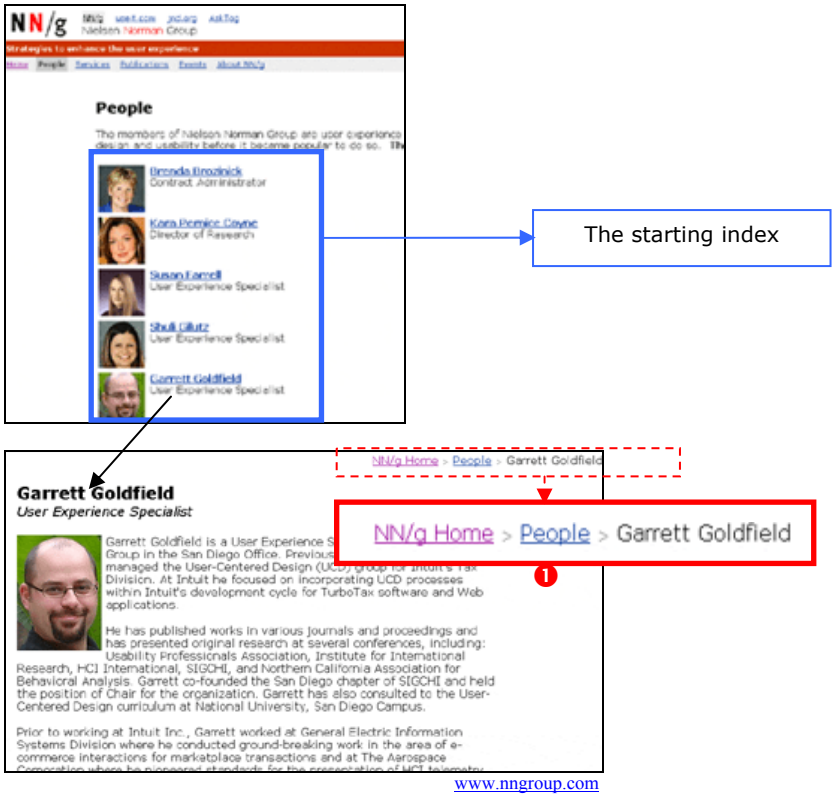
Feature	**Group of groups of topics Navigation** (collection, set of information objects)
Problem	**Introduction list**
Action	1. Navigate from the home page to a group of groups of topics (e.g. within the NGA web site– National Gallery of Art – "Dutch and Flemish 16th-17th centuries"); 2. Verify if it is understandable the reason why of the order of the group of topics presented in the list.
Problem	**Orientation clues**
Action	1. Navigate from the home page to the group of groups of topics ; 2. Try to understand the path engaged (where I was?) and/or the paths that it is possible to engage (where I can go?) – *Path visibility*; 3. Try to understand which page is browsing - *Status visibility* (where I am?); 4. Try to understand the context you are browsing (e.g. *the collections of paintings of "Dutch and Flemish 16th-17th centuries"*).
Problem	**Accessibility of group of groups of topics**
Action	1. Navigate from the home page to a group of groups of topics (e.g. from the homepage of the NGA web site to "Dutch and Flemish 16th-17th centuries" collections); 2. During this navigation count the number of clicks necessary to reach the group of groups of topics topics.
Example: Group of group of topics"	 www.nga.gov/collection/index.shtm **Introduction list:** the group of topics are organized in alphabetical order. **Orientation clues:** the orientation is given by the title of the page and of the paragraph (1). Note: the title "Paintings" (1) is not positioned in a visible part of the page: this could be a semiotic and graphic problem that affects also the navigation. **Accessibility:** from the homepage are necessary only two clicks to reach the group of groups of topic "Dutch and Flemish 16th-17th centuries".

Feature	**Backward navigation** (Reference to the past pages or actions)
Problem	**"Go back"** (Note: do not use the "go back" functionality provided by the browser)
Action	1. Navigate randomly or taking into account a series of tasks/scenarios (you have to create one or more scenarios); 2. When you find "Go back", "Previous page"… click it and verify if you really reach the previous page.
Problem	**History** (Note: do not use the "History" functionality provided by the browser)
Action	Verify if exist a history mechanism. If yes: 1. Visit randomly a number of topics and write the topics visited; 2. Using the history mechanism, verify if all the visited topic are reported.
Example	 www.unisi.ch **"Go back":** within the website of the University of Lugano is always present an icon for going back. Trying to use this function several times we have verify that it works well.  www.munchundberlin.org **History:** within the website munchundberlin.org it has been implemented a visual mechanism for tracing the visited topic. During a session we have visited 4 topics (3 prints and 1 author) and the system has correctly traced our session.

Open set: other may be added, according to the application domain and specific features.

ADVANCED NAVIGATION HEURISTICS II – NAVIGATION PATTERNS

Feature	**Guided-tour navigation**
Problem	**Orientation clues**
Action	1. Identify a guided tour within the website; 2. Navigate within the guided-tour trying to understand: a. which page is browsing – *Status visibility* (where I am?); b. the path engaged (where I was?) the paths that it is possible to engage (where I can go?) - *Path visibility*; c. the context you are browsing – *Context visibility*.
Problem	**Control**
Action	1. Navigating through the elements/members of a guided-tour try to: a. go "previous" (respectively "next"); b. try to restart the guided tour (respectively "stop" the tour).
Problem	**Navigation strategy**
Action	Evaluate if the pattern guided-tour is suitable for a satisfactory fruition of the content. For doing this: 1. count the pages of the guided-tour, 2. analyse the content of each page. and answer these questions: 1. do you remember the first page of the guided-tour? 2. do you have a global vision of the guided-tour?; 3. … *Note: the guided-tour is suitable for didactical and promotional purposes.*
Problem	**Topology**
Action	1. Start the navigation of a guided-tour and verify if it is understandable the reason why and the order of the elements of the guided tour.
Example	 **Orientation clues ❶:** the orientation within this guided-tour is given by title of the tour we are exploring (From the Tour: Dutch Landscapes and Seascapes of the 1600s): this information provides the context. Another orientation clue is the information about the position of the element within the guided-tour ("Object 4 of 8). **Control ❷:** the control of the navigation is given only by the possibility to continue the tour or to go back to the gallery (the starting point of the tour). Within this guided-tour is not possible to go "previous". **Navigation strategy:** this guided-tour is composed by 8 objects and the content of each object gives a complete idea about the object itself. Once finished the navigation within the guided-tour it easy to remember the visited objects and their contents. In this case, the strategy of implementing a guided-tour achieves the didactical goal of this part of the application. **Topology:** it is not clear the order of the object of the guided-tour.

Feature	**Index navigation**
Problem	**Orientation clues**
Action	1. from an index (list), select an element of the list; 2. once reached the element of the list verify if it is understandable that this element belong to the starting index (list) - *Context visibility*.
Problem	**Control**
Action	1. starting from an index (list) verify if it is possible to go to each element belonging to the index; 2. verify if from each element reached it is possible to go back to the index.
Problem	**Navigation strategy**
Action	1. evaluate if the pattern index is suitable for a satisfactory fruition of the group of objects in term of similarity of elements (e.g. photos gallery, video gallery, list of people…). 2. counting the number of the elements belonging to the list, verify if the cardinality of the list elements is suitable for the index navigation pattern (if the number is too high – e.g. over 10-15 elements – this strategy is not appropriated).
Problem	**Topology**
Action	1. starting the navigation from an index, verify if it is understandable the reason why and the order of the members belonging to the list.
Example	 **Orientation clues:** the orientation is given by the "Status bar" (1) provided by the application. Using this bar as a clue it should be clear that the selected element belonging to the starting list. **Control:** the "Status bar" (1) also allows the user to go back (clicking "People") to the starting list. **Navigation strategy & Topology:** the number of the elements of the list is not so high, so in this case the index navigation is suitable for presenting the members of the staff.

Feature	**All-to-all navigation**
Problem	**Orientation clues**
Action	1. Identify a topic of the website (e.g. the BMW 3 Series Coupé). 2. Navigate within the topic and for each page reached try to understand: a. the path engaged (where I was?); b. the paths that it is possible to engage (where I can go?) - *Path visibility*; c. page is browsing - *Status visibility* (where I am?); d. which is the context we are browsing - *Context visibility.*
Problem	**Control**
Action	1. Within the topic navigation verify if it is possible to navigate from one page to the others.
Problem	**Navigation strategy**
Action	1. Counting the number of pages (nodes) of the topic, verify if the cardinality (the number of the pages) is suitable for the all-to-all navigation pattern.
Problem	**Topology**
Action	1. Verify if it is understandable the reason why and the order of the pages.
Example	 www.bmw.com **Orientation clues** ❶**:** once we navigate within the (instance of) topic BMW 3 Series Coupé are always highlighted both the page we are browsing and the context. **Control:** using the contextual menu (❶) it is always very easy to navigate from one page to the others. **Navigation strategy:** see that the number of the pages is not so high the all-to-all navigation allows the user to reach every page with one click. **Topology:** in this case BMW used a very common order of the pages for presenting a product. In fact, they start with a (general) "Introduction" and for going in depth with the presentation they present in succession "Highlights" (with some sub-pages), "Multimedia gallery" … In conclusion, this order is appropriate for an easy and efficient navigation.

Open set: other may be added, according to the application domain and specific features.

INTERFACE DESIGN

Back to index

3.a SEMIOTICS HEURISTICS

During the interaction with a website the user should easily understand the meanings of the messages proposed. In particular, three main semiotic features should be considered:

- *String of characters:* the term(s) used for describing the meaning of a link creates expectations in the user and is the promise that if the user clicks on the link s/he will reach the content s/he is looking for; the terms used for synthesising the content through a title, a heading or a keyword should be clear and representative of the referred content.
- *Interaction images:* the meaning of any non-textual sign or symbol used for navigation purposes or for activating particular operations/services should be clear and intuitive.
- *Macro-areas:* the meaning of a single message often depends on the relation the message has with other messages on the same page: the way they are organised and grouped should help the user in understanding their meaning and the meaning of the whole page.

Feature	**String of characters (labels, titles, headings, etc.)**
Problem	**Ambiguity / Clarity**
Explanation	The term(s) used could be interpreted with different meanings by the user, making her/him confused. The main types of string of characters are: • *Link labels:* they should allow clear navigational choices. • *Headings (captions, subtitles…):* they should synthetize the referred content in an intuitive and familiar way; • *Titles:* they should introduce efficiently the topic of the page; • *Slogans:* they should synthetize the referred content in an intuitive and familiar way; • *Keywords:* it should be clear which the keywords of the content are. • …
Problem	**Labels Overlapping**
Explanation	On the same context there could be different terms/labels having a similar meaning. This could cause indecision in the user to choose the right link or to focus on a particular content.
Problem	**Generality vs. specificity**
Explanation	The term/s used could be either too generic (represent everything and nothing) or too specific, not synthesising exactly the referred content.
Problem	**Information Scent**
Explanation	Beyond the textual string, the user could have some additional content making him/her more conscious in his/her navigational choice. As an example, in an index the label of the link for an item could not be enough for letting the user to understand the meaning of the link: a thumbnail, a short text, a sound could help him in understand better what the textual string stands for.

Feature	**Interaction Images**
Problem	**Conventionality**
Explanation	Symbols and icons used for communicating a particular meaning and having an interaction purpose should be familiar to the user.
Problem	**Intuitiveness**
Explanation	If signs and icons do not follow standards and conventions, their meaning and function should be intuitive and easy.

Feature	**Macro-areas**
Problem	**Grouping adequacy**
Explanation	The messages composing a single page can be grouped in macro-areas, that is, in groups of messages having a similar meaning, a content relation or satisfying a common goal/functionality.
Problem	**Position of importance**
Explanation	Each page has a main communicative goal and a main topic to present. The main meaning should be easily recognisable and should be properly grouped with respect to their importance.

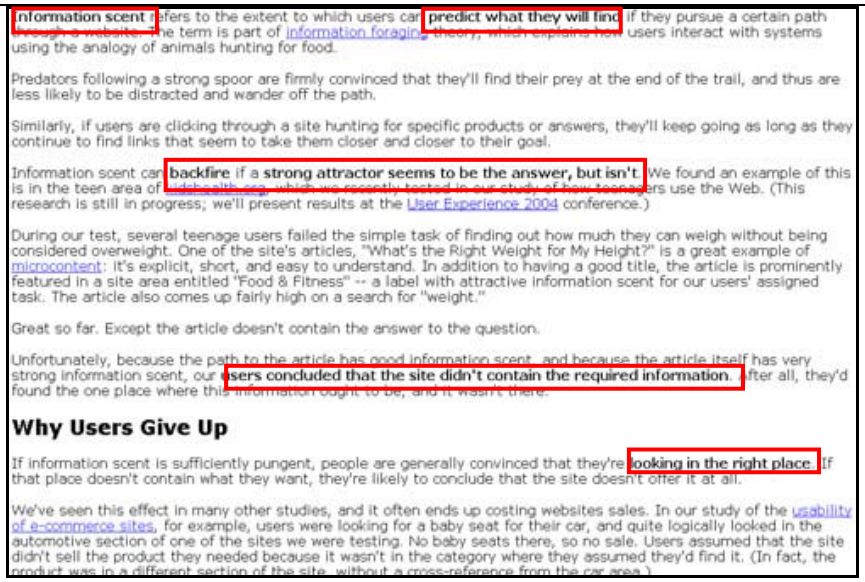
Back to index

3.b SEMIOTICS ACTIONS

How to use Semiotics Heuristics

The purpose of this document is to explain in an extensive way how to find usability problems for every semiotic usability feature and to provide a step-by-step action guide for detecting the different problems.

Feature	**String of characters (labels, titles, headings, etc.)**
Problem	**Ambiguity / Clarity**
Action	**A) Actions for testing the links labels** *Actions 1: without end- users* a. Identify all the links labels of the page (both labels for the main navigation and those for contextual navigation); b. Try to anticipate the target of the page (e.g. the label "Shopping bag" means that if we click it, we should reach the shopping bag). *Actions 2: using end-users* a. Ask to a sample of end users the target of the links presented within the page. *and/or* b. Write on a sheet of paper all the links labels of a page and ask to end-users the meaning of each label. *Note: it is possible to combine Actions 1) with Actions 2).* **B) Actions for testing Headings (captions, subtitles…)** 1. Identify all the Headings of the page; 2. Read the Headings and try to understand their meaning (without read the content); 3. For each Heading read the referred content and verify that they are consistent. **C) Actions for testing Titles** 1. Reading the title(s) of the page try to understand the main topic(s) of the page. 2. Read the referred content and verify that it is consistent with its title. **D) Actions for testing Slogans** 1. Reading the slogan(s) of the page try to understand the referred content. **E) Actions for testing Keywords** 1. Try to identify all the keywords of the page (content); 2. Once identified and isolated the keywords verify if they really summarized the content in an efficient way (Only reading the keywords do you grasp the topic of the page?).
Example	



Information scent refers to the extent to which users can predict what they will find if they pursue a certain path through a website. The term is part of information foraging theory, which explains how users interact with systems using the analogy of animals hunting for food.

Predators following a strong spoor are firmly convinced that they'll find their prey at the end of the trail, and thus are less likely to be distracted and wander off the path.

Similarly, if users are clicking through a site hunting for specific products or answers, they'll keep going as long as they continue to find links that seem to take them closer and closer to their goal.

Information scent can backfire if a strong attractor seems to be the answer, but isn't. (We found an example of this is in the teen area of kidshealth.org, which we recently tested in our study of how teenagers use the Web. (This research is still in progress; we'll present results at the User Experience 2004 conference.)

During our test, several teenage users failed the simple task of finding out how much they can weigh without being considered overweight. One of the site's articles, "What's the Right Weight for My Height?" is a great example of microcontent: it's explicit, short, and easy to understand. In addition to having a good title, the article is prominently featured in a site area entitled "Food & Fitness" -- a label with attractive information scent for our users' assigned task. The article also comes up fairly high on a search for "weight."

Great so far. Except the article doesn't contain the answer to the question.

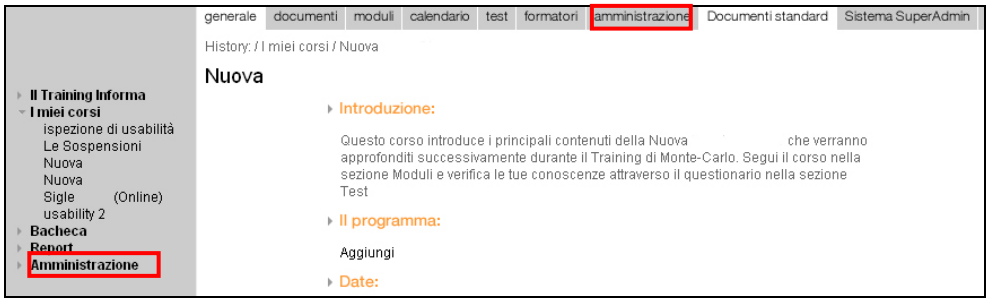
Unfortunately, because the path to the article has good information scent, and because the article itself has very strong information scent, our users concluded that the site didn't contain the required information. After all, they'd found the one place where this information ought to be, and it wasn't there.

Why Users Give Up

If information scent is sufficiently pungent, people are generally convinced that they're looking in the right place. If that place doesn't contain what they want, they're likely to conclude that the site doesn't offer it at all.

We've seen this effect in many other studies, and it often ends up costing websites sales. In our study of the usability of e-commerce sites, for example, users were looking for a baby seat for their car, and quite logically looked in the automotive section of one of the sites we were testing. No baby seats there, so no sale. Users assumed that the site didn't sell the product they needed because it wasn't in the category where they assumed they'd find it. (In fact, the product was in a different section of the site, without a cross-reference from the car area.)

This page of Useit website (www.useit.com/alertbox/20040802.html) presents different keywords that summarize in an efficient way the content's topic. Also the titles (article's and paragraph's titles) help the user to quickly understand both the main topic of the article and the content of each paragraph.

Problem	**Labels Overlapping**
Action	1. Identify all the labels of the page; 2. Verify if there are labels whose respective meanings overlap so significantly to obstacle the decision for the selection.
Example	

generale | documenti | moduli | calendario | test | formatori | amministrazione | Documenti standard | Sistema SuperAdmin

History: / I miei corsi / Nuova

Nuova

Il Training Informa
I miei corsi
ispezione di usabilità
Le Sospensioni
Nuova
Nuova
Sigle (Online)
usability 2
Bacheca
Report
Amministrazione

Introduzione:

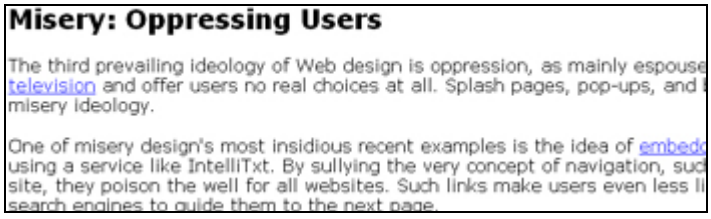
Questo corso introduce i principali contenuti della Nuova che verranno approfonditi successivamente durante il Training di Monte-Carlo. Segui il corso nella sezione Moduli e verifica le tue conoscenze attraverso il questionario nella sezione Test

Il programma:

Aggiungi

Date:

In this e-learning application there are two different sections called "administration" (for privacy reasons it is not possible to communicate the web site address and the company's name) For this motive, it is very difficult to understand immediately the difference between them. The user (especially if not yet familiar with the application) may feel confused seeing two sections with the same name and different functionalities.

Problem	**Generality vs. specificity**
Action	1. Identify and isolate all the types of string characters (labels, titles…); 2. For each category, verify if the string of characters is enough specific with respect to the content it refers to (e.g. a caption should explain specifically the referred image).
Example	

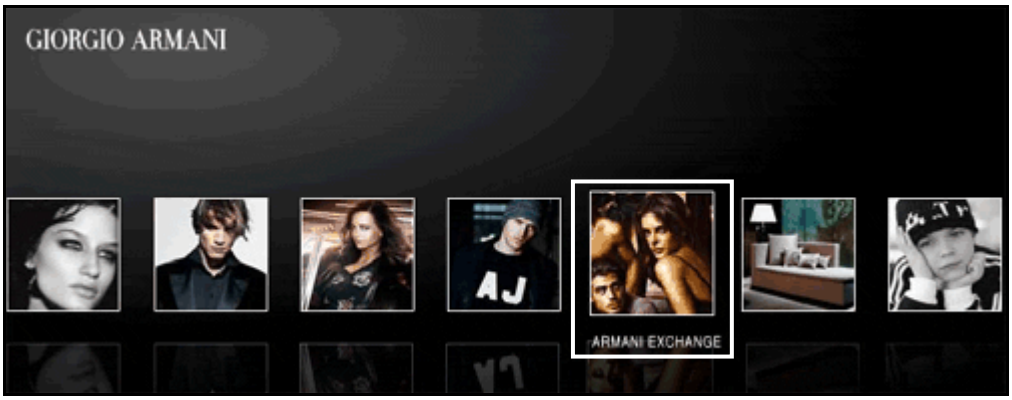
Misery: Oppressing Users

The third prevailing ideology of Web design is oppression, as mainly espouse television and offer users no real choices at all. Splash pages, pop-ups, and misery ideology.

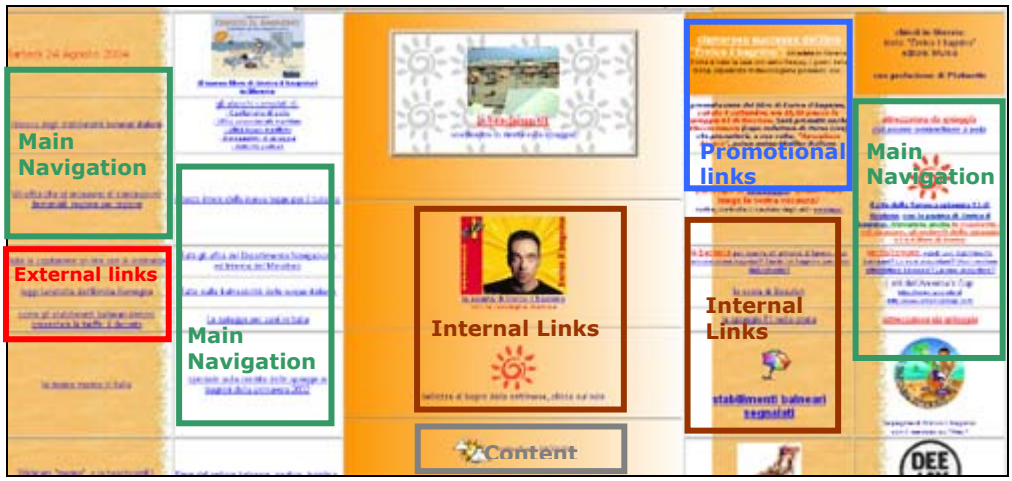
One of misery design's most insidious recent examples is the idea of embedd using a service like IntelliTxt. By sullying the very concept of navigation, such site, they poison the well for all websites. Such links make users even less li search engines to guide them to the next page.

This paragraph's title (extracts from www.useit.com/alertbox/20040830.html) is a good balance between creativity and specification. In fact, it explain enough specifically the referred content and it is possible to anticipate the related content.

Problem	**Information Scent**

Action	1. Verify if each string of characters anticipates enough the content it refers to or if a thumbnail, a short text, a sound… could help for better explain what the textual string stands for.
Example	 In the case of main menu of the Giorgio Armani's website (www.armani.com) the label "Armani Exchange" does not anticipate enough the referred content. The image used for helping the user to understand the label, does not help too much. In this case there is also an ambiguity problem of the label (see problem above).

Feature	**Interaction Images (icons, photos…).**
Problem	**Conventionality**
Action	1. Identify all the interaction images within the page; 2. Verify if the interaction images (icons, photos…) follow standards and convention familiar to a web user (e.g. if you allow the user to download a .PDF document, used the standard icon -  - for communicate the document format).
Example	 This Icon used within the city portal of Como (www.comune.como.it) serves for informing the user that it is possible to download documents. Using this icon for representing the possibility to download files, could create some problems, in particular the user does not know what kind of file he will open/download.
Problem	**Intuitiveness**
Action	1. Within the page verify if there are interaction images that do not follow standard; 2. If they exist, make sure that they are intuitive for a first-time/web-novice, by means of the following actions: a. select a sample of users and submit them the interaction images (e.g. you can insert the icons in a word document); b. ask to every user the mean of each interaction image.
Example	 Testing this tool-bar with a sample of end-users (nearly 20) we have verified that it is not so intuitive. In particular the end-users do not understand the symbol "Add to favorites" and "Back to the top of the page".

Feature	**Macro-areas**
Problem	**Grouping adequacy**
Action	1. Map the macro-areas of the page: a. map the macro-areas of the homepage; b. map the macro-areas of each type of internal page (e.g. you can have a template for the products page and another for the contacts). 2. Verify if the information units (for every macro-area) on the page are properly grouped with respect to their meanings, relations, and goals (e.g. if you have a macro-area for the main navigation, verify that all the links of this area lead to the main sections of the website).
Example	 Once mapped the types of messages in the home page of this web site (www.spiaggia61.it), it is possible to count at least 5 types of messages. The problem is that these messages are not properly grouped. For example the main navigation is positioned in three different places within the home page and sometimes the main navigational links are mixed with external or promotional links. In this case, the suggestion is re-think the message grouping.
Problem	**Position of importance**
Action	1. Map the macro-areas of the page: a. map the macro-areas of the homepage; b. map the macro-areas of each type of internal page (e.g. you can have a template for the products page and another for the contacts). 2. Verify if the information units (for every macro-area) on the page are properly positioned with respect to their importance (the importance depends in the meanings, relations, and goals of the page).
Example	On the homepage above (www.spiaggia61.it) the main navigation as well as presents grouping problems, it is also not properly positioned. In fact, the main navigation is positioned in three places, but not too much highlighted. This design's choice does not allow an easy recognition of the links for navigating to the main sections of the web site.

Back to index

3.c COGNITIVE HEURISTICS

Observing the interaction with a website two possible cognitive dimensions should be considered: on the one hand, the cognitive effort of the user while reading a single webpage; on the other hand, the cognitive aspects related to the understanding of the information architecture staying behind the web application as a whole, that is, the ground for understanding the whole meaning and structure of the website.

This document presents a number of cognitive problems and for each problem some usability heuristics are described.

The document considers two main features:

- *Cognitive heuristics related to a single page;*
- *Cognitive heuristics related to the Information Architecture.*

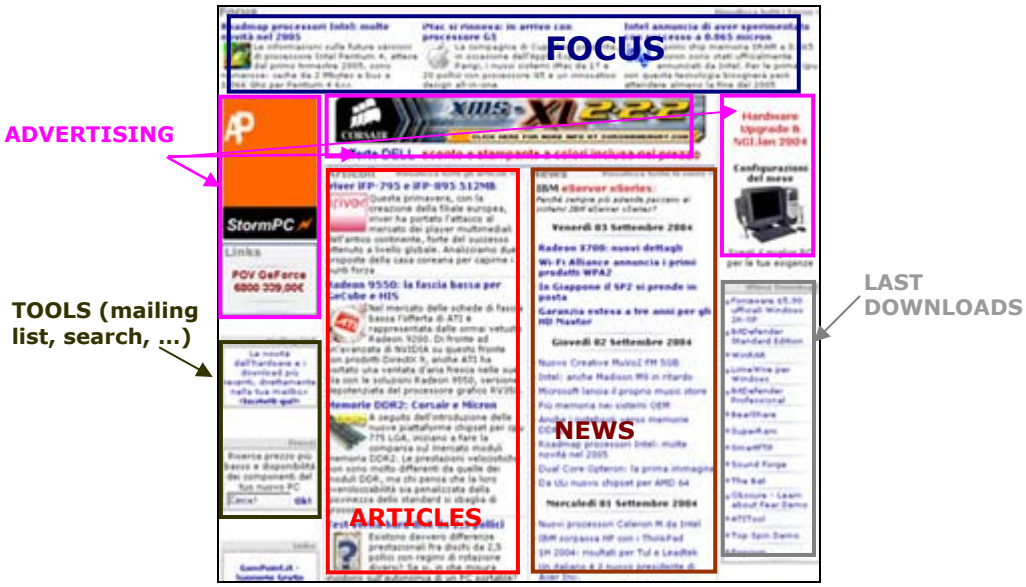
Feature	**Single page** Note: this feature (and related problems) could be verify for: • topic page(s), • group of topics page(s), • transition page(s), • Home page
Problem	**Information overload**
Explanation	A single page is composed by a set of different messages, each having a precise meaning. The quantity of the messages and their degree of heterogeneity could request an excessive effort for a first time/web novice to understand the whole page.
Problem	**Scannability**
Explanation	Users do not "read" the page until they find what they are interested in (a link, a text, an image). First of all, they "scan" it, basing on the structure of the page and how different messages are grouped and organised (in terms of macro areas).
Problem	**Grouping Adequacy**
Explanation	The messages composing a single page ca be grouped in information units, that is, in groups of messages having similar meaning, having a content relation or satisfying a common goal/functionality.

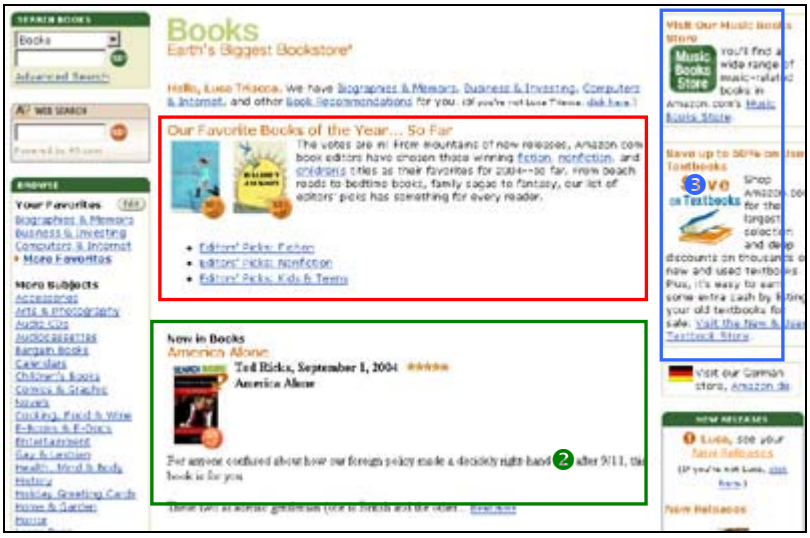
Feature	**Information architecture**
Problem	**Classification adequacy within group of topics and transition lists**
Explanation	The domain that the website describes is split in different information objects. The way these objects are classified within group of topics (e.g. paintings of 15th century) and within transition lists (e.g. paintings painted by an author) deeply influences the user understanding and memorisation of the domain.
Problem	**Separation adequacy within topic pages**
Explanation	The content describing a particular topic of the website (i.e. the content describing a car in a car company website) can be split in more pieces (pages): this separation can help the user to better understand the topic itself (e.g. if we separate the presentation of a car in different pages – "Presentation", "Technical features", "Design" … the user can deeply and better understand the topic).
Problem	**Website Mental map**
Explanation	Users always try to create a mental map of the website, that is, to understand all the different topics described in the website and how they are organised and reachable. The understanding and memorisation of the information architecture positively influences the user experience with the website.

Back to index

3.d COGNITIVE ACTIONS
How to use Cognitive Heuristics

The purpose of this document is to explain in an extensive way how to find the usability problems for every cognitive usability feature and to provide a step-by-step action guide for detecting the different problems.

Feature	**Single page** Note: these actions could be used for analyse: • Topic page(s), • Group of topics page(s), • Transition page(s), • Home page.
Problem	**Information overload**
Action	1. Try to identify the different messages presented in the page; 2. Count the number of messages; 3. Verify if the quantity of the messages and their meaning on a page is not overwhelming for a first time/web novice: a. enter in the page N-times (e.g. 10) with N different information goals (e.g. from the homepage find the review of a product, find the product X, find the event Y, contact the company…); b. For each goal, verify the needed time in order to understand where the right message is.
Example	 Analyzing a part of this home page (www.hwupgrade.it) it is possible to identify five types of different messages ("Articles/Focus", "News", "Downloads", "Tools" and "Downloads"). It is immediately evident that, even if the messages' categories are not too much, there are too information displayed on the page. The user, in particular the first time user, could have some problems for finding the interesting information.
Problem	**Scannability**
Action	1. Try to understand the meaning of the page in few seconds (e.g. in 5 seconds): a. Verify if the key messages are highlighted (by means of graphical symbols – bullets, icons -, multimedia files, keywords…) and try to understand the meaning of each message they refer to; b. Verify if the main sections in the page are clearly presented (e.g. search area, browsing area, registration area...).

Example	 Scanning this page of Amazon.com it is possible to understand easily the meaning of the page. In fact, this page is used for promotional purposes, in particular for presenting the "favorite" (❶) and new books (❷). Besides, other promotional messages are showed (❸) for supporting the idea that this page is used prevalently for promotional purposes.

Feature	**Information architecture**
Problem	**Classification adequacy within group of topics and transition lists**
Action	4. Create one or more scenarios (define task(s)/goal(s) –e.g. Find information about the new book of John Grisham and user profile(s)); 5. Try to achieve the goal(s) of the scenario(s) and verify if the list of the group of topics (e.g. the list of the paintings of 15th century) and/or transition lists (e.g. paintings painted by an author) are organized with respect to the classification belonging to the common ground of the user.
Example	 Navigating within the city portal of Como (www.comune.como.it) - taking into account the scenario "Find the information about army called-up" - to reach this information is quite complicate. In fact, the user should select: "Services for citizens" → "Certificates, Documents,…" → "The Course of life" → "Army Called-up". In this case, there are two problems in classification of this information: 1. it is quite "strange" to classify general information within the sub-section called "Certificates, Documents,…"; 2. it is as much "strange the classification within the sub-section "The Course of life".
Problem	**Separation adequacy within topic pages**
Action	3. Identify an instance of topic of the website (e.g. the BMW 3 Series Coupé); 4. Try to understand in how many pages the topic is split (e.g. the BMW 3 Series is segmented in 5 pages/sections). 5. Verify if the content of the topic has been properly split into pieces (pages/sections) (e.g. in an ecommerce website the description of a running shoe should not be split in 20 pages, seeing that, all things considered, it is a "simple" product – at least for the user).
Example	 www.bmw.com The presentation of the BMW 3 Series Coupé is split in three main sections: "Introduction", "Highlights", "Multimedia Gallery". Besides, the section "Highlights" is divided in four sub-section ("Design", "Engines", "Chassis", "Safety") and each sub-section is also split in some pages (e.g.

	the sub-section "Safety" is divided in "overview", "Airbags" and "Headlights". The fact of splitting the different information in these sections/pages, it is very useful for understanding the products. Besides, the "split strategy" is consistent with the "real world" (e.g. when we speak about the safety of a car we star with a "general overview" of the topic "Safety" and then we focus our attention on "sub topics" like airbags, headlights…).
Problem	**Website Mental map**
Action	1. Navigate randomly and/or taking into account one or more scenarios (define task(s)/goal(s) –e.g. Find information about the new book of John Grisham); 2. Once navigate through the website, take a sheet and try to draw (also in an informal way): a. the high level map (main section and sub sections); b. the contextual map of the different topics; c. come back the day after and try to reach the same pages previously visited.
Example	Navigating randomly through the BMW website (www.bmw.com) it is easy for the user to create a mental map of the web site. *High level map- main sections:* **- Products - Services - Fascination** The navigation among the sections is all to all (from each section it is possible to go to the others) and also to the "secondary" sections. *High level map- "secondary" sections:* **- News - Site assistance - Contact - Careers - Site map - FAQs - Legal disclaimer** The navigation among the sections is all to all (from each section it is possible to go to the others) and also to main sections. *Contextual map of the topic "Product"* *Formal representation:* **- Products** :: Introduction :: Highlights : Design . Overview . Powerdome . Front . Rear . Interior : Engines : Chassis : Safety :: Multimedia gallery :: Models and data sheets :: Catalogue :: Security vehicles *(Very) Informal representation* The topic "Product" is split in different sections (4-5) and some sections have sub sections (e.g. Highlights is split in "Design", "Engines", "Chassis" and "Safety"). In some cases, the sub sections are divided in different pages ("Design" is split in 5 pages).

Back to index

3.e GRAPHICS HEURISTICS

This level studies two aspects: the graphic design and the layout. The graphic design refers to choices bounded to colors, type of fonts, icons and other graphic elements on the page; the layout concerns to the spatial distribution of the graphic elements within the page.

Feature	**Overall graphic design**
Problem	**Visual identity**
Explanation	Lack of coordination with the visual identity of the company who run the site (if present).
Problem	**Use of a chromatic code**
Explanation	The correct use of colours in a website is very important for many reasons and helps the users in the navigation: - Colours can identify sections or subsections of the site; - Colours can reinforce the visual identity of the site; - Colours can attract the attention of the users on different elements of the pages (titles, links…); - The set of the colours of the site creates the look and feel of the site.
Problem	**Background contrast**
Explanation	The use of strong colours for the background or not suitable pictures can damage the readability of the contents of the website. Some matches of colours can be very difficult to read especially for people with visual disabilities.
Problem	**Font size**
Explanation	All fonts work at large sizes, problems start at smaller sizes. Text on the screen must be easy to read. Choosing the right font size is important to make it readable.
Problem	**Font colour**
Explanation	The colours used for screen texts must be accurately designed.
Problem	**Font type**
Explanation	Using a readable type of font with a readable size is important to make the reading easier.
Problem	**Text layout**
Explanation	Splitting a long text can simplify the reading. Very long pages (for example, containing an entire chapter) are difficult to scan, and scrolling up and down to refer to different sections of text can be frustrating. Also the wrong use of justification can make it difficult.
Problem	**Anchor identity**
Explanation	Anchors are used to reinforce the presence of a link on the page and it is very important to understand which are the anchors within the pages.
Problem	**Anchor states**
Explanation	When the mouse is over a link or after visiting it buttons and their anchors must communicate visible and well designed changes of state in order to help users in navigation.
Problem	**Icon consistency**
Explanation	Icons are used to represent topics to visit or tasks to do. It is important that the icon set matches with the other graphic elements of the site.
Problem	**Widgets consistency**
Explanation	Widgets are usually used to make up text and split it on the page in order to make it easily found in the text. The widget is a standardized on-screen representation of a control that may be manipulated by the user. Scroll bars, buttons, text boxes, text input area and radio buttons are all examples of widgets.

Feature	**Page layout**
Problem	**Position consistency**
Explanation	How objects are arranged on the screen determinates not only how good they look but how easy they are to understand and to use.
Problem	**Layout grid consistency**
Explanation	In the world of print and in the world of web grids give physical reference points to the space on the blank page. The role of the grid is clearest in designs that have a page-like appearance.
Problem	**Layout conventions**
Explanation	Users of western languages are conditioned to: - scan pages from left to bottom right; - assume that larger items are relevant; - assume that something above is more important that something below the page.

Feature	**Homepage**
Problem	**Redundancy – Overcrowded page**
Explanation	Because the screen has much lower resolution than a paper page, a screen that is filled with text, images, icons and other elements can be much harder to read.
Problem	**Page layout**
Explanation	Home pages have often free layout, this may cause problems in the users to understand the structure of the page.
Problem	**Use of Flash animations**
Explanation	Flash animations are used to make a site dynamic and interactive. Often these animations do not fit with the rest of the site.

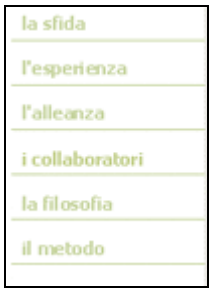
Back to index

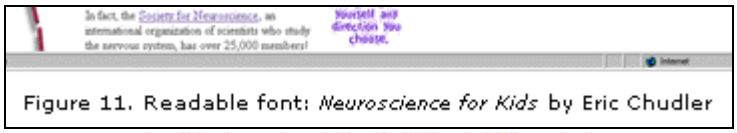
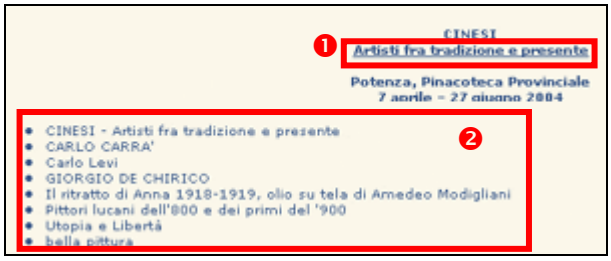
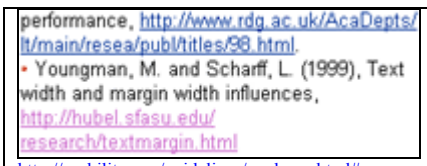
3.f GRAPHICS ACTIONS

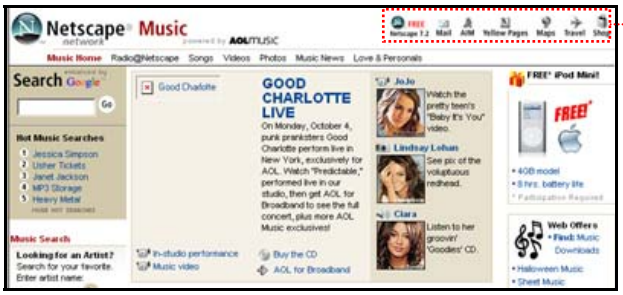
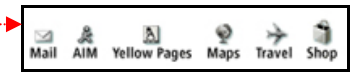
How to use Graphics Heuristics

The purpose of this document is to explain in an extensive way how to find the usability problems for every graphical usability feature and to provide a step-by-step action guide for detecting the different problems.

Feature	**Overall graphic design**
Problem	**Visual identity**
Action	1. Verify if the visual identity of the site is coordinated with the brand image. For this reason verify: a. if the company/institution logo is "always" correctly displayed; b. if the corporate colours are respected. c. if the overall website graphic style is consistent with the graphical style used for other media (e.g. the promotional brochures, video presentations, …).
Example	 Navigating through the web site of Ferrari (www.ferrari.it) it is possible to identify an overall graphic style that reflects the "heart of the company". Each main section ("Racing", "Cars", and "Corporate") is presented with a specific colour, but the "Ferrari style" is always in "background".
Problem	**Use of a chromatic code**
Action	1. Verify if all the colours of the chromatic set are used for their precise scope: a. verify that all the textual links have the same colour (if more colours are used, verify if it is clear the semantic behind this choice); b. verify that all the texts are written with the same colour (if more colours are used, verify if it is clear the semantic behind this choice); c. verify that all title, subtitle … are written with the same colour (if more colours are used, verify if it is clear the semantic behind this choice); 2. Verify the correct use of colours in order to identify website and/or page sections (e.g. the use of red colour for highlighting the news section); 3. Verify if the colours used in the site are not in conflict with the subject treated in the site (e.g. Black or dark blue for a kids website).
Example	 http://msdn.microsoft.com/ Within the main websites of Microsoft the textual links have the same colour (blue) and style (underlined). The only style difference is that there are bolded and normal links: the reason

	why of this choice is due to the links hierarchy (bolded link are more important).
Problem	**Background contrast**
Action	1. Verify if the background used does not obstacle the reading. 2. Verify how it influences the look of pages and the location of all other elements on the screen.
Example	 In this example (www.provincia.potenza.it/museo/default.htm) there is not contrast between the background (green) and the caption of this image (orange). For the user is very difficult to read the text that explain the image.
Problem	**Font size**
Action	1. Verify if the different types of text are readable (e.g. titles, subtitles, texts…). Research has shown that fonts smaller than 10-11-point elicited slower performance from users. For people over 65, it may be better to use at least 12 or 14 point. *Note: for verifying the font size it is possible to use a sample of users that try to read the content of the page.* 2. Verify if a suitable hierarchy is used among font titles, subtitles and texts, and if this is kept consistent across pages.
Example	 www.vodafone.it Within many websites the texts are written with font size of 8-9 point without the possibility to enlarge it using the browser's functionalities (the font are fixed by style sheets - .css). In these cases the solution is either to enlarge the size at 10-11 point or to give the possibility to enlarge them.
Problem	**Font colour**
Action	1. Verify if there is an adequate contrast between colour of the text and the background colour. (e.g. Green text over a red background) 2. Verify if the colour of the text is readable on the page. *Note: for verifying the font colour it is possible to use a sample of users that try to read the content of the page. .*
Example	 In this example, the font colour used for designing the contextual menu does not guarantee an adequate contrast. The readability of the entire menu is harmed from this design solution.
Problem	**Font type**
Action	1. Verify if the font is a standard font, verify that the size is readable and if is possible to enlarge font size. For example, it is very important to use sans-serif typefaces such as Verdana for small text of 9 points or less since the low resolution of many monitors means that the detail of a serif font cannot be rendered fully; 2. Verify that the use of bold and underlined text is correct. For example is wrong to use underline text to spot something important because underline text means that we are in the presence of a link.

Example	 Figure 11. Readable font: *Neuroscience for Kids* by Eric Chudler http://ebooks.strath.ac.uk/eboni/guidelines/guideline11.html This image caption is written with a readable Font type (Verdana 7.5), even if the use of italic (*Neuroscience for kids*) could partially obstacle the readability.
Problem	**Text layout**
Action	1. Verify if the text is properly split into spaced paragraphs. 2. Verify if the text is not justified but aligned left or at lest centred. Justify text is the worst alignment for screen content.
Example	 http://historynet.com/we/blwhiteelephantsaloon/ In this example, even if the text is too long, it is at least properly split into spaced paragraph and aligned left. This layout helps the user to better read and scan the page.
Problem	**Anchor identity**
Action	1. Verify if the link anchors have clear and conventional visual symbols associated to be distinguished from non-link elements.
Example	 In this page, two different styles of textual links are used. For the first link (❶) a bolded and underlined font is used, while for the second (❷) only the blue colour is employed. In this case, it should be better to have a common anchors identity (style): in fact it should be possible that the user does not recognize that ❷ are links.
Problem	**Anchor states**
Action	1. Verify if the links/buttons communicate a visible change of state when activate.
Example	 http://usability.gov/guidelines/readscan.html#one In this example, the visited link is differently displayed with respect to non visited link. This design solution helps the user to immediately remember the visited pages.

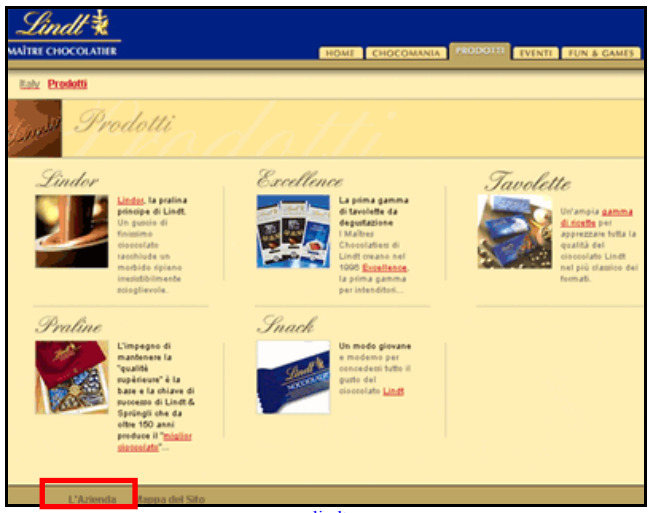
	 www.lugano.ch	In this other example, when the mouse is over the link, a well visible change of state appears (the link becomes red and underlined).
Problem	**Icon consistency**	
Action	1. Verify if the icons used are consistent and adequate with respect to the colours and the other graphic elements in the site. 2. Verify that icons work both as a group and as independent pieces. 3. Verify that icons are instantly recognizable, simple and cross-cultural.	
Example	  In this example, it is clear that the icons' set used for representing the interactive sections or external web site are both coherent with the visual style of the website and instantly recognizable. Besides, it is possible to use them both as a group and as independent pieces. http://channels.netscape.com/ns/music/default.jsp	
Problem	**Widgets consistency**	
Action	1. Verify if the widgets used are consistent and adequate with respect to the colours and the other graphic elements in the site.	
Example	 www.overture.com All the widgets used in Overture website are very adequate with respect to the colours and, more in general, to the overall graphical style of the website.	

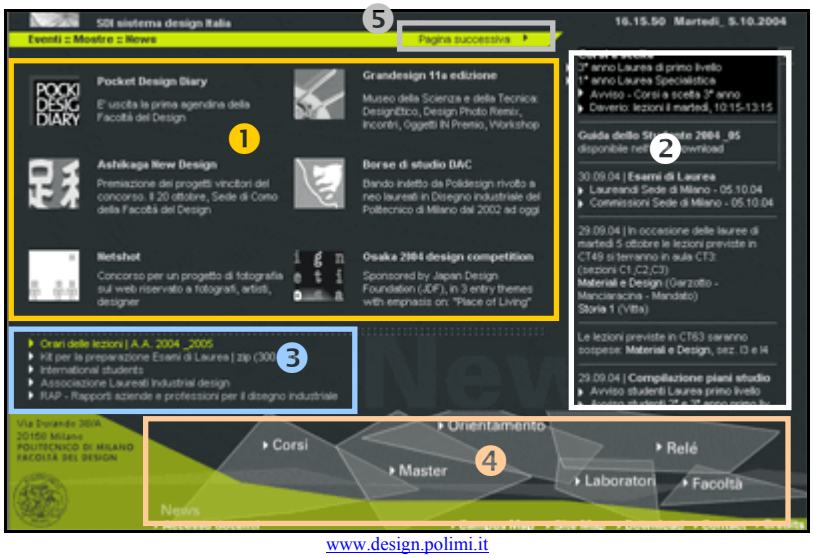
Feature	**Page layout**
Problem	**Position consistency**
Action	1. Map the macro-areas of the page's types (topics, group of topics, transition pages) and try to identify the elements composing the page layout; 2. Navigate through the website and verify if the elements positions are kept consistently across pages.
Example	

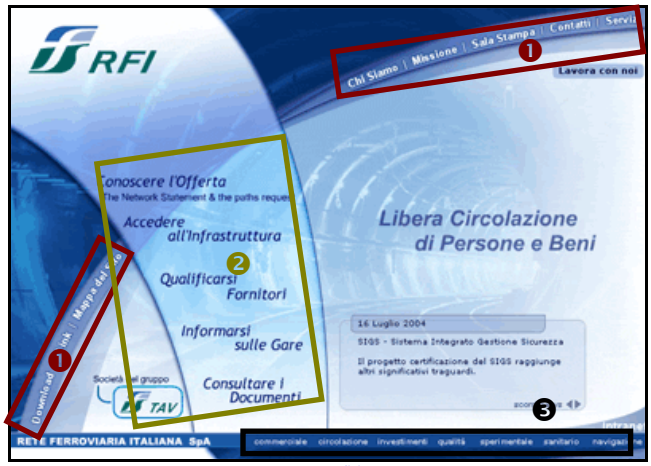
www.ubs.com

Comparing these two pages of "Our company section" of UBS website, it is clear that the position of fixed elements is maintained consistent among the pages.

Problem	**Layout grid consistency**
Action	For all the different types of pages (topics, group of topics, transition pages): 1. Try to identify the layout grid (template); 2. Verify that all elements composing the template are kept consistently among the different types of pages;
Example	 www.amazon.com The books' pages of Amazon present a layout grid (template) that is kept consistency across the pages. In fact, all the main elements such as "Item information menu" (1), "Recently Viewed Items" menu (2), the "book information" (3), "Ready to buy" box (4) and "More buying choices" box (5) have a consistent position across the pages.
Problem	**Layout conventions**
Action	Verify that: 1. The page is organized for facilitating the user to scan from left to bottom right; 2. The more relevant items are larger than less important; 3. The more relevant items are positioned above and not below the page (for example

	verify that the main menu items are not positioned in a less visible portion of screen).
Example	 www.lindt.com In this example, the position of the link "L'azienda" ("the Company") is left-bottom. In general, this position could be a valid choice when the section presents only a brief history of the company and not dynamic and updated contents. But in this case, the section "contains also the possibility to access to "Investor Relations" section, which is a "sub-website" for finding all information about economical strategy and company's performance.

Feature	**Homepage**
Problem	**Redundancy – Overcrowded page**
Action	1. Verify it the elements on a page are not redundant; 2. Verify if the page is not overcrowded.
Example	 www.design.polimi.it This Homepage provides too much information: - the highlights of the University (1); - the news of the University (2); - the links to the useful sections for the students (3); - the main menu (4). Besides if we click on the link "next page" (5) we reach another "home page" where more highlights are presented.

	Note: this home page is optimized for 800x600 resolution, therefore all the elements are displayed within this (tiny) screen space!
Problem	**Page layout**
Action	1. Verify if: a. the home page has a recognisable layout; b. the goals of each element of the layout are clear; 2. Verify that the layout respects the characteristics of the entire site.
Example	 www.rfi.it This homepage are not built with a clear page layout. In fact, it is very difficult to understand which the main menu is (❶) and the role of the other menus (❷,❸).
Problem	**Use of Flash animations**
Explanation	Flash animations are used to make a site dynamic and interactive. Often these animation does not fit with the rest of the site.
Action	Verify if the flash animation are coherent with the graphic aspect of the site, especially for icons, colours and graphic elements used.

TECHNOLOGY/PERFORMANCE

Back to index

4.a TECHNOLOGY/PERFORMANCE HEURISTICS

The technology dimension of a web application is concerned with all those aspects related to technology choices and implementation style. The aspects that could be analyzed within this dimension are the formal correctness of the code (the site do not have to generate errors), the management of critical sections (e.g. operations) and the reaction of the system to errors or unexpected user behaviours.

Feature	**Errors management**
Problem	**System reaction to errors of a user**
Explanation	When some errors occur, the system is blocked and the user cannot go on.
Problem	**Scripting errors**
Explanation	Some Java- VB-Scripts codes could generate errors in particular conditions.
Problem	**Operations management**
Explanation	Hypermedia browsing during a procedure could cause errors or the operation to be cancelled.

Feature	**Browser compatibility**
Problem	**HTML interpretation**
Explanation	HTML is not supported and interpreted in the same way by every browsers (e.g. in visualizing tables and layers).
Problem	**Plug-ins**
Explanation	Installing plug-ins requires administrator permissions on the machine. This should be take into account when the web site used particular plug-in.

Feature	**Optimization**
Problem	**Page download time**
Explanation	The page has a too big size, the user should wait too much before seeing the content.
Problem	**Media streaming**
Explanation	Streaming audio or video could be not optimized for slow connections.

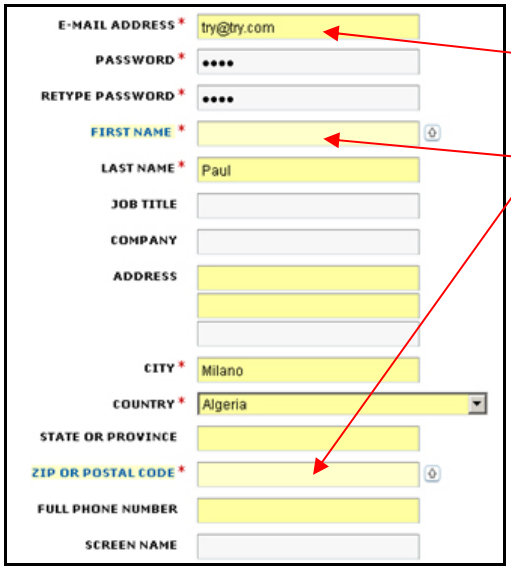
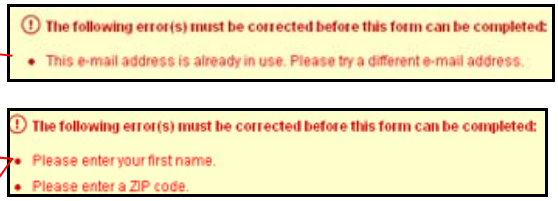
Open set: other may be added, according to the application domain and specific features.

Back to index

4.b TECHNOLOGY/PERFORMANCE ACTIONS

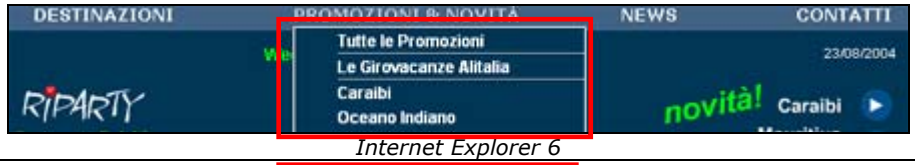
How to use Technology/Performance Heuristics

The purpose of this document is to explain in an extensive way how to find the usability problems for every technological usability feature and to provide a step-by-step action guide for detecting the different problems.

Feature	**Errors management**
Problem	**System reaction to errors of a user**
Action	*Action 1:* 1. Try to fill forms with incorrect information (e.g. for date, emails, countries, etc.); 2. Verify if the system provides an alert about the needed/failed information. *Action 2:* 1. Try to fill form and do not fill some mandatory form fields; 2. Verify if the system provides an alert about the needed/failed information.
Example	  Filling this form (example extracted from Macromedia.com) the system provides an alert for the email field (we have used an email that is already in use) and for mandatory fields (that are not completed). At the contrary, the system does not provide any alert for the fields "City", filled with Milano, and Country, filled with Algeria. It seems clear that the system does not match fields "City" and "Country".
Problem	**Scripting errors**
Action	1. Try to fill forms with special characters (", èàéöäü, ?, etc.) 2. Verify if the system accept and recognize special characters (and allows the user to continue the operation); OR 1. If the system does not accept special characters, verify if an alert is provided by the system.
Example	 Filling this form (extracted from Microsoft.com) we have insert a special character (#): immediately the system alert us about accepted characters and the correct procedure for filling the form.

Problem	**Operations management**
Action	1. Start an operation (e.g. buy the book "The Da Vinci Code") and, during the process (e.g. fill a form for buying the book), verify what happen when you browse out using some global navigation menus or the "back" button (e.g. you decide to buy another product and you want to read more information about it); 2. Observe the system reaction when you start a new operation (e.g. add the new product in the shopping bag): verify if the system resumes the previous operations (e.g. it presents a shopping bag with two products).
Example	  In the Amazon website (www.amazon.com) if you start an operation (e.g. "buy this book") and then you stop it and you select another book, the system resumes the previous operations (in this case it shows the previous selected books).

Feature	**Browser compatibility**
Problem	**HTML interpretation**
Action	1. For accomplish this action you have to install at least these browsers: a. Explorer b. Netscape c. Opera 2. Try to browse the site using these browsers and verify if the website is correctly displayed.
Example	 *Internet Explorer 6*  *Netscape 7.1*  *Opera7.11* This page (extracted from American Airlines website – AA.com) is correctly displayed on the three main browsers (Explorer, Netscape, Opera), even if complex javascripts and .css are used for generating graphical effects.

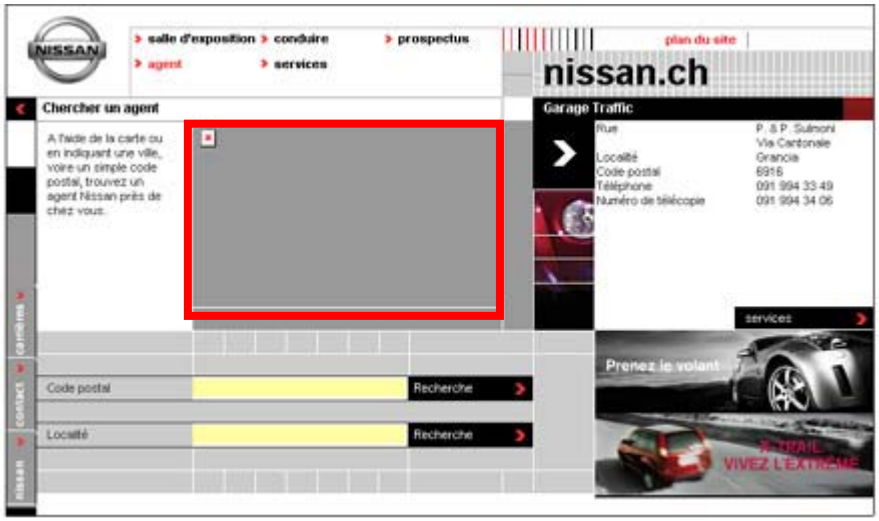


Internet Explorer 6

Netscape 7.1

Opera7.11

Instead, in this example the sub menu are not correctly displayed both using Netscape and Opera (the mouse-over action is not supported). It is clear that this problem can create serious navigational problems since the user can not select the subsections.

Problem	**Plug-ins**
Action	1. Browse the site using a non-administrator account; 2. Try to use every special feature (videos, animations, graphics, etc.); 3. Verify if the features are correctly displayed.
Example	 Navigating within the Nissan.ch web site for searching an address of a reseller, the system provides the possibility to use a map for choosing the region and the city. The problem is that for correctly displaying the map a particular plug-in is required, otherwise it is not possible to use it the map (note: for navigating this website we have used a Pentium 4 with Windows XP operation system and all the common plug-ins installed). In this case, the only solution is to use a standard technology for creating these maps (e.g. Flash).

Feature	**Optimization**
Problem	**Page download time**
Action	1. Use different types of connection: a. 56 kb; b. ADSL 256kb/512kb/ 1Mb c. … 2. Browse the site and try to download pages (in particular pages with big images or videos) and verify the time needed for displaying every single page (you should not wait more than 10 seconds).
Example	 Using a connection ADSL 1Mb (Best effort) and browsing the web site of Malta Island (www.visitmalta.com) the pages are very slow to load. The faster pages are displaying in average 15 seconds, but there are sections (e.g. Interactive map) that are loading in more than 30 second. This web site presents a lot of contents and it looks well from the graphical point of view, but the pages' download time produces serious usability problems.
Problem	**Media streaming**
Action	1. Use a slow connection and try to stream a media file from the site; 2. Observe if data are transmitted fluently without scatterings or interruptions.
Example	 Watching online the Deejay TV (www.deejay.it) it is possible to verify that video and audio are transmitted in a fluent way. In the case of the user utilizes a very slow connection (e.g. 56 Kb/s), the system provides a message that explain that the best view is obtained with connections over 150 Kb/s. However, it is clear that is very difficult to watch online a TV with analogical connections.

Open set: other may be added, according to the application domain and specific features.

Back to index

HEURISTICS SYNOPTIC TABLES

NAVIGATION HEURISTICS

HEURISTIC	FEATURE	LEVEL OF COMPLEXITY
Segmentation Orientation clues Accessibility of different pages	**Navigation within a topic**	**BASIC**
Introduction list Orientation clues Accessibility of topics	**Navigation within a group of topics**	
Transition list Orientation clues Accessibility of target	**Navigation within a transition**	
Landmarks Consistency Accessibility	**Overall Navigation**	
Orientation Backward navigation Depth anticipation	**Tree Navigation**	
Consistency Segmentation Orientation clues Accessibility of different pages	**Navigation within a kind of topic**	**ADVANCED I**
Introduction list Orientation clues Accessibility of group of topics	**Navigation within a group of groups of topics**	
"Go Back" History	**Backward Navigation**	
Orientation clues Control Navigation strategy Topology	**Guided-tour navigation**	**ADVANCED II** **NAVIGATION PATTERNS**
Orientation clues Control Navigation strategy Topology	**Index navigation**	
Orientation clues Control Navigation strategy Topology	**All to all navigation**	

CONTENT HEURISTICS

HEURISTIC	FEATURE	LEVEL OF COMPLEXITY
Accuracy	**Text**	**ADVANCED**
Currency		
Coverage		
Content objectivity		
Authority		
Conciseness		
Text errors	**General Communication quality**	**BASIC**
Multimedia consistency		

TECHNOLOGY/PERFORMANCE HEURISTICS

HEURISTIC	FEATURE	LEVEL OF COMPLEXITY
System reaction to errors of a user	**Errors management**	**ADVANCED**
Scripting errors		
Operations management		
HTML interpretation	**Browser compatibility**	**BASIC**
Plug-ins		
Page download time	**Optimization**	**BASIC**
Media streaming		

INTERFACE DESIGN HEURISTICS (Cognitive, Semiotics and Graphics Heuristics)

Cognitive heuristics

HEURISTIC	FEATURE	LEVEL OF COMPLEXITY
Information overload	**Single page**	**ADVANCED**
Scannability		
Grouping Adequacy		
Classification adequacy within group of topics and transition lists	**Information architecture**	**ADVANCED**
Separation adequacy within topic pages		
Website Mental map		

Semiotics heuristics

HEURISTIC	FEATURE	LEVEL OF COMPLEXITY
Ambiguity / Clarity	**String of characters**	**BASIC**
Labels Overlapping		
Generality vs. specificity		
Information Scent		
Conventionality	**Interaction Images**	**BASIC**
Intuitiveness		
Grouping adequacy	**Macro-areas**	**ADVANCED**
Position of importance		

Graphics heuristics

HEURISTIC	FEATURE	LEVEL OF COMPLEXITY
Visual identity	**Overall graphic design**	**BASIC**
Use of a chromatic code		
Background contrast		
Font size		
Font colour		
Font type		
Text layout		
Anchor identity		
Anchor states		
Icon consistency		
Widgets consistency		
Position consistency	**Page layout**	**ADVANCED**
Layout grid consistency		
Layout conventions		
Redundancy – Overcrowded page	**Homepage**	**ADVANCED**
Page layout		
Use of Flash animations		