



How to make Internet and Intranet web sites accessible and easy to use

Visual Friendly white paper

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1. Introduction

Internet provides every day a large range of information and new devices. The growing use of mail sets up as a new mode of communication.

We all are concerned by this evolution : students, working people, retired people... But there is a population to which it presents a tremendous interest : disabled people, and particularly visually impaired people.

Provided that they have computers with adapted software, low visionned or blind people can visit websites and access to information without any assistance.

They gain in autonomy, integration and efficiency.

However, among all these websites, only few are conceived to be easily accessed. Webmasters give priority to design and visual estheticism and let accessibility aside, because they often do not even know about it.

To solve this problem, countries like the United States and Canada enacted laws enforcing information accessibility. Also, France and the European countries set up a legislation encouraging accessibility.

This white paper aims at stating:

- web users' needs in term of legibility, with a focus on visually impaired people' needs
- mandatory technical elements to make a website accessible
- the restrictions of an accessibility approach limited to the technical aspect, excluding usability
- the added value of Visual Friendly software that makes websites accessible and usable for all Internet or Intranet users who are willing to improve their reading comfort.

2. Different web users

A website provides a range of information to everyone ; but each web user has own characteristics.

On a technical point of view, each web user can choose the way of accessing to websites. Mainly a computer screen, but also an interactive TV or a mobile phone. The web user can use the browser last version including the newest plug-ins, or keeps on using an older browser version that is not updated.

Each web user presents cognitive specificities. Some prefer textual information, others graphical information.

Moreover, each web user has personal sensorial abilities. Some suffer from eyestrain due to a long-lasting reading on a computer screen, others have a visual disability.

Eyestrained people

According to statistics published by ASNAV (Association Nationale pour l'Amélioration de la Vue) 6 people out of 10 working on a computer screen suffer from eyestrain.

Visual troubles related to age

According to statistics published by ASNAV, 85% of over 50 years old people have visual troubles, especially for close reading. According to national census, in 1999, 1 French out of 3 is a senior, which implies that 19 millions people suffer from visual troubles.

Visually impaired people

It is difficult to estimate precisely the number of French visually impaired people, because of a great difference between disabilities and their level of seriousness. According to surveys, 8% of men are color-blind or dichromatic, which gathers 2.3 millions French people.

- 3.1 millions French people declare having a visual disability (INSEE n°742, October 2000.)
- 1.1 million visually impaired people in France, 100.000 of whom are blind.

“Visual impairment” gathers thus different pathologies with specific needs. Due to subsidies, visually impaired people are twice as equipped with computers as the average population. They are customers of on-line devices and, globally prefer a trademark because they can't access to a global visual information about products and services to compare them (packaging, information on label).

Accessibility needs of low visionned people

To access to digital and web information, low visionned people use screen magnifier associated with current browsers (Microsoft Internet Explorer, Netscape Navigator...) They may also use the accessibility options proposed by Microsoft to interact with the Windows interface.

In this context, they want to better locate themselves on screen and improve web pages legibility.

Self-localisation on screen

When using screen magnifiers, low visionned people enlarge the whole screen : they cannot watch the entire page at one go, so they have to mentally recompose its global structure. To watch entirely the web page, they have to scroll the page not only vertically but also horizontally, which is quite disturbing.

It is crucial to provide a page setup adapted to large characters they use (no horizontal scrollbar, for example)

Standardization of main web functionalities (links localization in the page, search field...) is also a key factor to efficiency. It enables low visionned users to find main web functionalities on the same place and thus, get into reflex self locating on every web page.

Improve the legibility

Webmasters often privilege estheticism to the prejudice of text legibility : characters are too small, on a colored background, with cascading style sheets forbidding any modification.

Low visionned people must adapt easily characters' size (enlargement or reduction) colors of characters, background, links... while keeping a correct page setting (without overlapping lines, without horizontal scroll difficult to use...).

Blind people's accessibility needs

A blind user can read the information on a computer screen with a screen reader software, associated to a voice synthesis or a Braille keyboard (or both at the same time). However, Internet and intranet sites remain little accessible or legible with these tools. Pages structure (text on different columns, frames use, global confusing data organization...) constitute an obstacle for visually impaired people, as websites have been thought and created for sighted users. Screen readers analyze directly pages code, which is very different from its visual display. To this point, information remain often unaccessible.

Better self-localisation on web pages

When displaying each web page, the screen reader begins reading information on the top left part of the page (often logo and site map).

The blind user is thus compelled to read the same information on each page, before accessing to significant content, which is sometimes not even relevant.

To avoid reading it all, line per line, blind web users want to use navigation links easily noticeable and different from the content. They also want to be able to read diagonally, surfing from a paragraph to another so as to access directly to the targeted information. Blind users wish also they could identify paragraph titles easily.

Visit websites with their own technical devices

Many websites provide information or technologies unaccessible to technical devices (images without alternative text, frames, applets or scripts...). It is essential, in this matter, to offer alternatives to let visually impaired people access to the same information content.

3. Make websites accessible

The legal context

There are many laws and recommendations to make public websites accessible by visually impaired people.

- French circular on public websites 7th October 1999 ¹
- French law project on Information Society 14th June 2001²
- E-Europe 2002 action plan for Web for all³
- 25th September 2001 European Commission recommendation and 8th October 2001 European Council resolution
- Disability Act in the United States June 2001⁴

Technical guidelines

Despite standardization and normalisation efforts, few websites are effectively accessible by visually impaired people.

Moreover, accessibility issues do not concern only visually impaired people. Accessibility issues also concern users of new devices like Wap, WebTV, PDA, or even seniors whose sight gets poorer (cf. chapter Different Internet users).

TTS' use addresses a larger public : access to web from a car, vocal interactive servers...

The World Wide Consortium (W3C) and its group specialized in web usability issues, the Web Accessibility Initiative (WAI) have tried to standardize Internet, in order to integrate accessibility issues in web pages conception process.

To make a web site accessible, some simple rules must be followed, and especially 2:

- Any visual element (graphical) must be completed by a textual comment, called alternative contents. Attribute "Alt" enables to comment a picture
- Document structure (content) and page-setting (aspect) must be treated separately. Structure is specified by HTML elements (titles, subtitles, paragraphs, images...), page-setting by cascading style sheets (characters, colours, spaces..). This difference between content and aspect enables to identify the document logical structure and to extract its information easier.

¹ <http://www.internet.gouv.fr/francais/textesref/circu071099.htm>

² <http://www.internet.gouv.fr/francais/textesref/pagsi2/lsi.htm>

³ http://europa.eu.int/information_society/eeurope/news_library/pdf_files/communication_accessibility_fr.doc

⁴ <http://www.section508.gov/index.cfm?FuseAction=Content&ID=11>

The following points introduce the W3C and WAI main guidelines :

HTML 4.01 and Cascading Style Sheets 2 use

To be usable on any media, including technical devices dedicated to disabled people, content (information) must be treated separately from page-setting (page setup tags).

HTML 4.01 norm provides necessary tools to produce accessible code. HTML interest is not only based upon a multimedia and hypertext setting-up. It enables to go further : text includes structural, even semantic, information, usable by the browser according to user needs, preferences and possibilities.

Graphical setting-up is realized thanks to Cascading Style Sheets (CCS). New HTML specifications (HTML 4.01, December 99) and CCS (CCS2, May 98) improve HTML documents accessibility, and offer new work methods (CCS by browser version and by plat-form).

CCS use offers advantages to webmasters :

- a richer page-setting, many documents can be based on the same CCS, which is important for a quicker website updating
- no checking upon website homogeneity (particularly interesting for a website developed by different teams). Similar information (paragraphs, types of characters) are presented automatically in the same way, without repeating their particularities.

Moreover, CCS use enables to improve a document accessibility by offering to a visually impaired user the possibility of modifying and customizing page-setting.

Relevant HTML elements' use

Structuring tags must not be used for paragraphs formatting : this generates code overcharge and disturbs a visually impaired user. HTML 4.01 intergrates stylesheet notion which enable to separate structural information from page setup.

Particularly, tables use as a page-setting tool creates accessibility problems. Columns separation is not systematically easy to understand for a user who does not visualize the entire document.

When possible, use of tables as a page-setting tool must be avoided. When there is no other solution (double columns, navigation tool separation...), the table should be read in a linear way for text browsers and also legible by a TTS. Only data have to be presented in a table.

It is also very important to make sure that a piece of information is not scattered in several table cells, so as to keep the original meaning.

Structure and homogeneity

A coherent interface

The environment must be coherent for the user in term of user-computer dialogue. This implies to develop applications and interfaces in such a way that similar fields, objects and functions look the same to users.

Examples :

- a research field must be in the same place in each web page
- form validation buttons must have a coherent graphism on the whole website.

It is very important to keep an homogeneous presentation on every web page. The user can better locate him or herself as he/she identifies web site marks.

A clear presentation

Graphical interface must be pleasant and the page must be rapidly loaded. If the web pages are too condensed, the user cannot identify the relevant information.

Clear and precise links

Braille readers have only 40, even 20 characters. This is why textual address of links must be short .

Browsers make it possible to navigate link by link thanks to "Tab" key. This function is often used by visually impaired people. It is possible to enable navigation from link to link thanks to specific attributes ("tabindex").

Links accessible by shortcuts

To support people using no mouse, it is easier to add in the code some shortcuts (attribute "accesskey") to reach rapidly the link.

Link context must be defined in the link heading

Considering the navigation link per link, it is very important to use headings understandable in any context, not only in the one where they appear (end of a paragraph). Links, with a textual heading too general, like "click here" must be avoided. In this precise case, the web user is supposed to have a peripheral input like a mouse, but this is not systematic. Link has to be followed, selected, it is not systematically clicked.

Links must support efficiently the web user

If links have similar headings, they have to address the same URL. "Title" gives the page content to which the link addresses and supports the web user in the navigation. The link heading must be integrated to "Title", as a TTS only reads this attribute not the content of the link.

Make graphical data accessible

Alternatives to graphical elements

Pictures, and graphical elements in general are often used in the web context. Most websites use relatively complex page-setting, with navigation based upon scripts and applets. Although they bring an esthetic design, these technologies remain unaccessible, and in some cases – applets, animation Flash, videos...- an accessible alternative must be proposed.

The basic solution consists in commenting with text non-textual elements (alternative content). HTML 4.01 provides some attributes like "title" or "alt", which gives information about the link or the picture to the user.

In the case of pictures, attribute "alt" and tag can be used. With this attribute a brief description of the picture is given. For example, if a picture of a zoom is a link to a search page, the alternative text should be "search" instead of "zoom".

Long descriptions are required for complex graphical elements or pictures indispensable for the information understanding (for example boards, diagrams, or powerpoint documents).

There are different types of pictures and graphical elements :

- navigation pictures : menu, validation button, map pictures, basket
- products pictures : pictures presenting or illustrating products
- information pictures : prices tables, schema, powerpoint presentation...
- structure pictures : to steady page-setting

The attribute " alt" makes possible for textual browsers, like Lynx or BrailleSurf, and for TTS to convert the graphical information into textual information. This is useful, as textual browsers describe pictures without text with an understandable name (like : "9782211064972.gif", the picture name of a book cover proposed on line by FNAC).

Moreover, the alternative text can provide complementary information (name of a person, type and reference of a product...). This contributes to support web users in their navigation by providing information viewed in help labels. At last, alternative text improves the website referencing (the text is also referenced by motors).

Textual transcription is indispensable for navigation pictures (map images, headings) and for information pictures (tables, diagrams...)

Resources use in original format

Resources like powerpoint presentation or PDF documents are normally not web resources. Nevertheless, many documents are available in their original format, even in a web page (doc, pdf, ppt, rtf...).

Neither W3C, nor WAI recommendations forbid the use of other digital formats than HTML.

These norms only recommend that the first format treated by the browser is HTML. But if other formats are available, they must be identified as different formats, and if possible, the page must include a link to a site where the web user will be able to load the adequate plug in or the adequate visualization application. Some formats already provide accessibility options.

Forms optimization

The form realization is one of the most important steps in the website online process. Nowadays, forms' use is a must, for a purchase online, a research or a newsletter subscription.

The form is the ultimate step before launching an action (purchase, subscription...) Its construction in its setting (usability) and in its coding method (following the W3C recommendations) is essential.

When referring to W3C recommendations, a form realization implies a particular methodology.

Available fields must be gathered : the website construction must be coherent, the fields chaining must use the preconized standards.

Moreover, form fields must be defined : the use of the tag <LABEL> and the attribute "for" enables to link the form heading to its field (text input, and view field).

Refer to the corresponding WAI recommendation :
<http://www.w3.org/TR/WCAG10-HTML-TECHS/#forms>.

Pictures as validation buttons (replacing classical buttons) are accessible if a textual equivalent supports the picture.

Flash, javascript, applets, multimedia objects

WAI recommendation : "Pages must be accessible even when the user does not have or activate the last technologies "

This general WAI recommendation concretely means to make sure that the use of technologies like Flash and applets Java do not lead to a loss of information for disabled users or specific users.

Flash animations

Flash is a technology to create animated sequences based upon vector drawings.

Integrate correctly Flash sequences requires technological skills. In order to provide a proper user experience, some simple rules must be followed :

- Use Flash to valorize contents for which Flash brings a real added value, for example to show a process evolution (pollution, erosion, transformation...)
- Propose automatically firstly the alternative to the Flash version to the browser, and present the Flash version as an option, an added value to the user. The Flash version must not be obligatory.
- Not use Flash plug in script detection to force the navigation to the Flash version of the animations. Even if the user has the Flash plug-in, he does not systematically want to use it. Many users when they can choose, prefer the HTML website version.
- Include some animations readable with a previous Flash version.
- The website must be readable without Flash technology. Flash must be used only for precise sequences, included in the HTML pages.

In any case, to propose systematically an alternative to Flash.

These guidelines can be transposed to use of other plug-ins especially those providing video and 3D view of objects (Real player, Quicktime, Quicktime VR....)

Javascript, applets and multimedia

Some technologies create accessibility problems, the basic solution is to provide systematically an alternative solution, based on standard HTML elements accessible by everyone. Both versions must be similar in their content and brought up to date simultaneously.

Frameset

A frameset is an HTML page including links to other frames, structuring their common view.

Frames have had a large success since their introduction and their support by browsers, resulting in the creation of hybrid interfaces complex in term of maintenance.

The significant advantage of frames is that a frame can stay on a screen (to present a menu...) when changing page in the content. This could also offer maintenance advantages to webmasters.

Nevertheless, the frames use creates problems and the main one is the impossibility of marking a page with a bookmark to find, record or offer rapidly the information on web.

The construction of websites based on frames must be avoided for websites providing dynamic information, as their maintenance is very difficult.

Accessibility to a framed website is more complex for a blind user, as he can only access the content of one frame at a time. This makes the construction of a mental representation of the whole frameset difficult. Each frame and its link into frameset must have understandable names. Indeed, this information is the only one available to a blind user to navigate from frame to frame.

It is interesting to note that W3C made obsolete the tag <FRAMESET> in 1999.

Till today, accessibility norms aimed at making compatible the constituting elements of web pages with different help tools used by visually impaired people.

But, no norm could guarantee the websites usability, nor answer to each web user needs'.

4. Accessible websites easy to use

As explained before, accessibility is today mainly treated on a technical point of view.

The respect of technical guidelines makes informational content of each web page accessible. But there is no guarantee that a website will be **globally** easy to visit, simple of use and efficient.

A badly-organized website, even if technically accessible, will remain complex and unpleasant to visit.

A strong demand from users

All surveys show that web users would appreciate more clearness in the information presentation and simplicity of use for the websites they visit.

- 76% of web visitors ask for more websites easier to use (Forrest Research)
- 2 thirds of the web users consider that is difficult to locate themselves in sites they visit (Benchmark group, February 2002).
- 44% of websites users do not succeed in finishing their purchase on e-business websites (Jakob Nielsen, Alertbox 19th August 2001.)

Visual Friendly specificity

Traditionally, web usability deals with the quality of the content provided by a website, devices pertinence... what is called : the website utility.

Usability also studies the way users discover a website et the way they interact with it. Will they be able to navigate, look for information, or buy a product on a e-business website ? Web usability deals with its easyness of use.

Visual Friendly usability specialists enlarged this consideration of web usability, by including the accessibility dimension, to enable any user, whatever they need, to access to the same content, in the best conditions.

They carried out a survey among 80 users, to identify the common needs of all web users, whether they suffer from eyestrain, whether they are long-sighted, or whether they have a visual disability. These needs are :

- an easy self-localization on a web page and on a website
- improvement of the pages legibility

It clearly appears that these needs cannot be answered by the sole technical response.

That's why Visual Friendly created the Visual Friendly software, which makes possible for each web user to adapt websites display to his/her own reading comfort.

Visual Friendly software

As web visitors have all different needs, we think it is better to propose to each user a tool to have a customized display of the website. Visual Friendly software was created in this intent.

Visual Friendly acts as a filter modifying websites (Internet and Intranet) to make them clearer and more legible, while keeping the whole information.

A quicker localization on screen

On every site offering Visual Friendly software, the essential elements of each page (logo, title, rubrics available ...) are clearly identified, localized at the same place and respect the presentation chosen by the user.

Such a page visualization facilitates :

- the information and the navigation in the visited website
- the discovery and the handling of new websites

Customized view

According to his/her own needs, the web user can select a pre-defined filter among the proposed choices, or define his/her own criteria of legibility : size of characters, colors (text and background, links), the general web page organization.

When blind, he/she can adapt the filter to TTS or Braille keyboard : localization of links (on the top or on the bottom of the page), choose to mark titles, rubrics...

Whatever the adaptations are, the page-setting adjustment is automatic and proposes a maximal reading comfort (text organization, no horizontal scroll, easier self-localization).

5. Conclusion

The Visual Friendly specificity in its approach of accessibility is to add the usability dimension to the traditional technical approach. Visual Friendly usability specialists enlarge web usability by integrating to accessibility, notions like utility and usability.

As pavements accessible to disabled persons, now used by people with pushchairs or people with cases, Visual Friendly software has been conceived to answer the needs of web users with a visual disability, but provides in the same way to anybody a better reading comfort and a simpler web use.