Visual Metaphors for Designing Portals and Site Maps

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IMPORTANCE OF METAPHORS IN DESIGNING PORTALS AND SITE MAPS

When one says, "life is a struggle," "life is a journey," "at the evening of the life," "at the dusk of the life," he or she is using metaphors. A metaphor denotes a figure of speech that makes a comparison between two things that are basically different but have something in common. In computing, the older metaphor is the desktop metaphor, which was used by Apple for the first visual interface. In the desktop metaphor, the computer screen is a virtual "desktop" with electronic "folders," "documents," "disk icons," and a "trash can," which are patterned after the physical objects in the physical office. Now the desktop metaphor is quite common in all visual operating systems. As Catarci, Costabile, and Matera (1995) said, "The more the metaphor is appropriate and visually impressive, the easier it is for the user to grasp the intended meaning."

Presently, practically all institutions, companies, associations, and even some people have their own Web site. Several methodologies exist to design them, but few of them give importance to the selection of an adequate metaphor to structure a Web site. In this article, we will not exhibit a new methodology, but moreover, examine some metaphors in order to make analysis of their relevance, their usefulness (i.e., the way they are facilitating the user when navigating).

First of all, let us clearly define what portals and site maps are. Taking the news magazine metaphor, we can say that the portal corresponds to the cover, and the site map to the contents of the Web site. In other words, the portal will include items, which can be of interest for the administrator, whereas the site map describes the complete structure of the Web site. According to Van Duyne, Landay, and Hong (2003), "a sitemap is a high level diagram that depicts the overall organization of a site. This site map shows the structure of a Web site." See also Kahn (2001).

However, this distinction is not always clear because some Web sites do not exhibit site maps at all, whereas some portals are designed as site maps. The expression "home page" is also widely used. Generally speaking, a home page can be seen as the first screen of the Web site, and generally corresponds to the portal.

A Web site can be composed of so-called pages, even though there are not really physical pages as in paper documentation. Perhaps the expression *logical pages* can be more adequate. In the remainder of this article, we will use the word *page* to express a set of information units, which have some consistency to be together. By information units, we will refer to paragraphs, pictures, etc., some of them having links (URL's) to other pages perhaps located into different sites. Some information units can be passive or active. By passive, we mean that they are purely informational, whereas active units can allow the reader some interaction. Moreover some information units can be generated automatically, for instance as a result of a query against a database. Anyhow, a Web site can be described as a directed graph where nodes are pages and arc links. Of course, it must also be a connected graph without loose pages. From a pragmatic point of view, the more links existing to a page, the more accessible it will be.

In the case of multilingual sites, those definitions must slightly vary (see later in this article). Indeed, a sort of pre-portal is seldom used as a home page to allow accessing to different sub-sites, each of them written with only one language and having its own sub-portal and sub-site map.

From a technical point of view, let's remember that in images, one can create active zones in which one can click to go somewhere else. In HTML, they are called mapped images. One can state that they derived from hypermaps as presented by Laurini and Milleret-Raffort (1990).

Differently said, we can propose other definitions:

- A site map is the entry structure to access all pages lying in a Web site,
- Whereas a portal allows the accessing to only few pages, which are considered as the more important for the administrators (highlights).

Concerning the use of metaphors for Web site design, let us first of all mention that the two words portal and site map evoke metaphor: portal meaning the entrance gate and site map the cartography of the Web site. We can summarize the situation as shown in Table 1.

In metaphors, we must define two sets, a source and a target, and a mapping between them.

From the area of databases, Haber, Ioannidis, and Livny (1994) define a visual metaphor as being a mapping between the data model and a visual model. In our case, the visual model will be for the design of Web sites (Laurini, 2002).

Table 1.

	Portals	**Site Maps**
Existence	Always	Not always
Contents	Salient items	Exhaustive or quasi exhaustive table of contents
Use of metaphors	Possible	Possible

Regarding the importance of visual languages and interfaces, please refer for instance to Shneiderman (1998) especially p. 207 et sqq.

In this article, we will not give a methodology to specify the selection or the contents of those pages and information units: in this book, some other colleagues will detail this aspect. However, we examine current metaphors used in the design of Web sites, and try to analyze them to compare their consequences, advantages, and drawbacks. But, at first, we will very rapidly examine portals without visual metaphors and then portals with metaphors. In the subsequent section, we will examine a site based on the continuation of the same metaphor. Then the news magazine metaphor will be inspected, and we will finish by trying to model the Web site portals.

TEXTUAL PORTALS

The first aspect to mention is that some sites use neither metaphor nor visual tools—the presentation is only made with words. In this category, we can distinguish text-only portals and textual portals with some pictorial decorations.

Text-only portals presently are very rare, although there were the majority in the 1990s. Take for instance the site of the city of South Milwaukee http://www.ci.south-milwaukee.wi.us/. Several years ago, the portal was practically text-only, with a unique icon for the letterbox. Few years after, the style is quite similar, and only a picture of the city entry sign was added, emphasizing the idea of a portal. See Figures 1 and 2 for examples.

Text-only portals or portals with light pictorial decoration reveal the use of technologies such as HTLM in which it was possible to include images, but not to organize the whole portals visually.

Anyhow, even those portals were common in the past, they were very functional, and were a sort of preliminary step to reach present portals.

Even though the French Minitel experience (for instance http://en.wikipedia.org/wiki/Minitel) was not very known in the U.S., let us remind you that this system was built on the telephone system and was very useful to inform people. Minitel is still in use in France and in some other countries; for instance in France, contacts with the French administration (information, forms to fill, etc.) are still made through Minitel, as for example in university registration or results in the exams. Text-only Web sites can be seen as outcomes of the Minitel experience.

ANALYSIS OF SOME EXISTING VISUAL METAPHORS

Although myriads of metaphors can be potentially used in portals and site maps design, let us examine some of them, which can be considered as representative examples. Among them, let us mention graph layouts, flowers, metro line maps, booklets, flipcharts, tender maps, virtual cities, and virtual museums.

Graph Layouts

One may discuss whether a graph is a metaphor or a mathematic tool for representing relations between objects: in our case, the more interesting part is the layout of the graph. In this article, we will consider graph layouts as visual metaphors. When a site has a hierarchical structure, two kinds of layout can be found:

- Tree-like structure, in which the home page is located at the top of the screen (Figure 3(a)),
- Home page centered, in which the home page is located in the center of the screen (Figure 3(b)).

Variations about the tree-like structures are given in Figure 4—a schematized tree and types of flowers.

The company Inxight (www.inxight.com) proposes a software product (name Star Tree) to design home pages. Starting from the Web site graph of pages, this software product gives a home-centered graph whose main characteristics is when we click in a page, this one becomes the new center whereas farthest pages are discarded. This presentation is

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