

## Creation of a Personal Space with HyWebMap

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### Abstract

*The Web is an open, evolutionary and heterogeneous information space. To exploit this heterogeneous space and better orientate the reader, we developed the HyWebMap system which allows: orientation in the space visited by using a benchmark tool, a browser, a history tool and a global image display based on an interactive map. The reader can create a personal space starting from the spaces visited and enrich it by adding and renaming links. HyWebMap allows the reader to add nodes and annotations to personalise his space. HyWebMap notifies and assists the reader when a change occurs in his personal space.*

### 1. Introduction

In this article, we introduce the software Web tool HyWebMap [2][3]. It has been developed at the "Paragraphe" Laboratory at University of Paris VIII using the Java Language. The version 1.0 of HyWebMap can be downloaded from the site: <http://www.labart.univ-paris8.fr/hwm.html>.

### 2. Description of the HyWebMap system

#### 2.1. The Web Agent of the HyWebMap

In the HyWebMap system [Figure 1], we have created a software tool (called an « agent ») that is able to analyse any HTML page or Uniform Resource Locator [URL] chosen by a reader. The agent lists the principle characteristics of the page or URL, deleting any obsolete internal or external links from the site and allows the reader to save this information in a personal database.

#### 2.2. Creating a database

After the web agent has completed the analysis of the site chosen by the reader, it creates a relational database containing tables of **nodes**, **links**, **anchors**, **profiles**(i.e. the characteristics of a Web page: the number of characters, images, external and internal links, etc) and **properties** (describes the informational characteristics of a node (page) : title, date of creation, key words, authors etc.). In addition, the web agent copies the pre-existent relation *linking* (Page-A, Page-B, Link L) which includes all the links of Page-A that are attached by a link L to a Page-B.

#### 2.3. Navigation with the Web map (virtual network)

Following the definition of the database the reader can see a map (a "virtual network") of the visited space (nodes and links). The navigation can be global, HyWebMap displays all the nodes and links of the visited space, or local, displays only the links attached to a specific node [4]. The readers can modify the map by adding nodes and personal links. Personal links can be added by using the copy/paste functions or by graphically linking the nodes on the map (simply drawing an arrow between two nodes). **Nota bene:** A web page has a sequence of MIME (Multipurpose Internet Mail Extension) fragments. It can be a sequence of texts, sounds, and video. HyWebMap considers each fragment as a node.

#### 2.4. Construction of a personal space

With the HyWebMap system, it is possible to create a personal virtual meta network from other virtual networks. The readers can then widen their meta networks with personal links and nodes. The Meta network is saved on

the reader's hard drive under a reader-defined name and it takes the ".hwm" extension by default. At this stage, the meta network is like a *virtual network*.

The reader can :

1) navigate locally in the virtual network without being connected to the Internet which reduces access time. When the reader wants to visualise a page, HyWebMap calls the navigator installed on the reader's computer. The reader is then free to switch at any time between his navigator and his virtual network.

2) re-organise the structure of a site visited to match his personal knowledge of the domain without changing the structure of the original site.

3) build virtual thematic networks in relation to his centres of interest.

## 2.5. Update and surveillance agents of the virtual network

We have developed surveillance agents that constantly verify the availability of nodes in the virtual network from their original sites.

## 2.6. Renaming links

In the HyWebMap system, we have introduced the concept of renaming links between nodes. This function allows the reader to personalise his network. He can name the links between nodes according to his knowledge of the content of the pages. This function enables the reader to have a more reflexive and planned navigation.

## 2.7. The HyWebMap Navigation Tools

Navigation in HyWebMap is either global or local. As global, it displays on screen all the nodes and links of the visited space. HyWebMap has several tools to help the reader navigate in his network:

- **Navigation by history**: A classic tool, it enables the reader to go back to a node already visited.

- **Navigation by level of arborescence**: The reader can choose the level he wants to visit in the arborescence of his virtual network.

- **Navigation by date**: The HyWebMap system saves the navigation history of the virtual network for two weeks. The reader can ask to see the visited nodes during a period of time defined between two dates. HyWebMap presents a virtual navigable network of the nodes already visited, which gets rid of duplicates. That is not the case for all standard navigators which only present a list of nodes visited in the time zone.

## 2.8. Annotations, key words attached to the nodes

The personal virtual network presents the reader's web space. HyWebMap enables all readers to widen their virtual networks by creating their personal annotations on one or several nodes. This annotation can be a text, links or a text between links. This results in a virtual network annotated with a network of notes [1].

An annotation has 3 distinct fields :

A **comment field** to make comments concerning texts, pictures or a particular link.

A **key words field** (not really part of the node) key words can be created by the reader and can be used during the interrogations on the network.

A **variation field** used for synonym or syntax correction. Also used for format modification.

For a given node, the usage of each of these fields is optional.

They are also completely independent. This distinction between annotations is very useful when performing a search. The annotations are in HTML format. Each time a node is revisited, the attached annotation appears in the navigator.

## 2.9. The generation of a website from the HyWebMap virtual network

We have created a function to enable the generation of a virtual network into HTML format. It can save and export the virtual network to HTML format. The mechanics of this function are completely transparent to the reader. This is very useful because the consultation of the network can be done by a standard navigator.

## 3. Domains in which HyWebMap can be used

HyWebMap, a functional system is used in several domains:

- **Education** : Teachers can re-organise their courses in accordance with the themes of each course section. The students can then create their own virtual networks according to their main interests. Presently, several teachers from the Hypermedia, Documentation, Education Sciences Departments at the University of Paris VIII use HyWebMap as a tool to prepare and organise their classes.

- **Research** : Several students use HyWebMap as a system to search for information on the web. They create virtual thematic networks around their research.

- **Web portals** : Portals created around a specific theme.

- **Long Distance Teaching**.

HyWebMap beyond its technical characteristics allows the user to be placed in his main role of reader/author in a

situation that facilitates the ability to build and enrich his own knowledge with any knowledge space.

Different professional and educational situations which have tested HyWebMap encourage us to continue tests in the field of information.

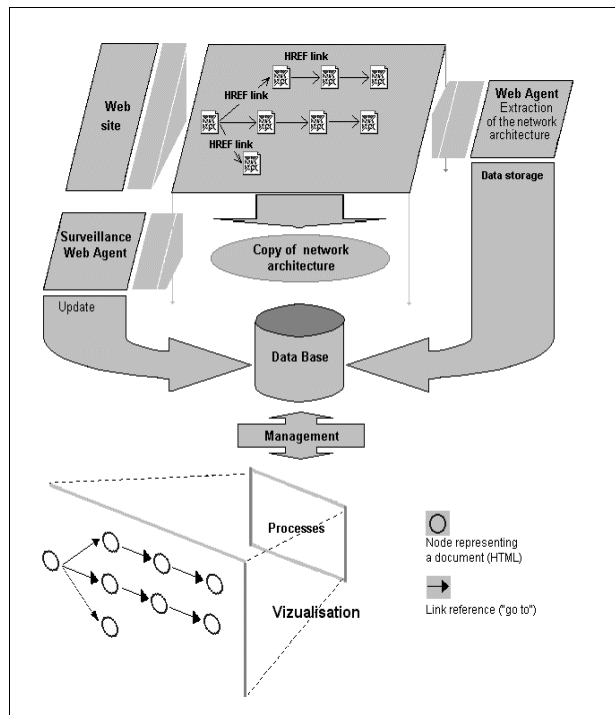


Figure 1. HyWebMap architecture

#### 4. Discussion

Many tools can create Web site maps : WebAnalyzer [5], CHEOPS [6], Mapuccino [7], MAPA [8], etc. The most *innovating* one is Paul Kahn's MAPA [9][10]. It can build a 3 D map from a URL in a Java applet. It uses colors to separate the hierarchical levels of the html pages. MAPA is not only a navigation tool, it can also be a tool to manage Web sites. HyWebMap like MAPA has skills to navigate and manage Web sites. The differences between the two systems are that HyWebMap's reader can re-organise the visited space by creating his own network depending on his point of view without affecting initial nodes and links. He can append nodes and annotations into this virtual network and rename links. HyWebMap can generate new sites automatically, browsable by any navigator.

#### 5. Conclusion

HyWebMap beyond its technical characteristics allows the user to be placed in his main role of reader/author in a situation that facilitates the ability to build and enrich his own knowledge with any knowledge space.

Different professional and educational situations which have tested HyWebMap encourage us to continue tests in the field of information.

By, now, we develop extensions on HyWebMap in order to ameliorate interface in using 3D technologies which appears more relevant for browsing and building virtual spaces.

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