DESIGNING HYPERMEDIA :

AN EXPERIENCE IN MULTIMEDIA CATALOGUE OF BUILDING PRODUCTS.

HALIN G.[ab], BIGNON J.C.[ac], HUMBERT P[a].

[a]CRAI (Research Center in Architecture and Engineering)
Ecole d'Architecture de Nancy. 2, rue Bastien Lepage, 54000 Nancy.
Tél : 03 83 30 81 46.   Fax : 03 83 30 81 27.

[b]University of Metz.

[c]Ecole d'Architecture de Strasbourg.
France.
Email : {bignon,halin,humbert}@crai.archi.fr

Introduction

The definition of an universal structuring model of the technical documentation is arduous, indeed utopian considering the great number of products and the diversity of relative information. To answer to this situation we are trying to develop a general approach of the documentation. It is based on the fact that eighty percent of realized, exchanged and consulted information with computer tools is on a document form.

We propose a model of document hypermedia structuring. This model allows the definition, the presentation, the navigation and the retrieval of general information on building products by a document manipulation. It is associated with a hypermedia design method adapted to document management. This method proposes, after the identification of the user, three phases of hypermedia definition : data definition, navigation definition and user interface definition.

This model and method have been used to realize the DOMITEC application which is described in this article.

1. Hypermedia and Technical Documentation

The advantages and drawbacks of hypermedia structuring used to represent a set of information are exposed in many books and articles [1].

The technical documentation and the product cataloguing are domains where hypermedia can propose many functions : intuitive navigation, precise information retrieval, animated presentation (video), or commented (sound), product selection, search for product components aided with a graphical presentation of nomenclature.

 These services are essential considering the important volume and the multidimensional (multi-media, multi-lingual, multi-structure, multi-view, multi-culture) feature that the information on the building products and on those who manufacture them have.

Considering this situation, the information must be organized with a coherent structure associated with many functions of access, manipulation and exchange. An hypermedia structuring can answer this objective if the representation of navigations and accesses are based on a strong organization of data. In order to build, to manage and to communicate this hypermedia structuring, we have defined an adapted method of hypermedia design.

2. Documentation Hypermedia Structuring

Our hypermedia structuring method, as similar methods [2-4], contains three definition phases : data definition, navigation definition and user interface definition.

In the data definition phase, all the available information on a technical documentation are described with a specific data model where the based description unit is the document. This step reveals the existing links between pieces of information and manages the coherence.

The navigation definition allows the description of browsings and accesses the hypermedia will propose. This phase generates a navigational schema composed of a nodes graph. Each node represents a manipulation function of the information described in the data schema of the previous phase. We have defined three sorts of information manipulation : information consultation, information retrieval and information exportation.

Finally in the user interface definition phase, the visual aspect of each node and the interactions synchronization are determined.

3.1 INFORMATION DEFINITION

The data model used is inspired by the one of the hypermedia MORE system [5]. Its principal characteristic is to exhibit, in the data schema, the potential navigations and the types of media used in the future hypermedia (figure 2).
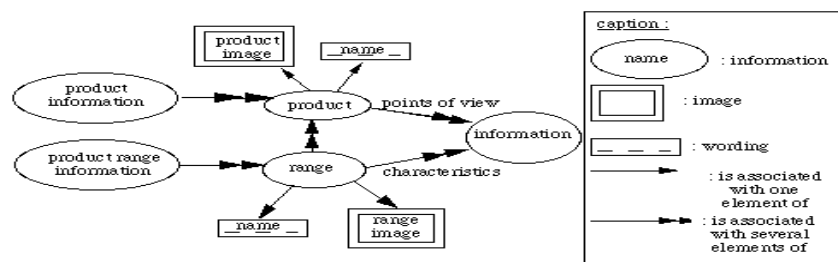

Figure 1: information on products and ranges.

The main information which is manipulated is a company representing a manufacturer of products. The building culture being different from a country to another, the information linked with a company is also dependent of a country. This information includes the description about the company and also the one about its ranges and its products. The information description is done in the language of concerned country.

The multimedia information is present in every descriptive facets of a company. For example, the information about the ranges or products is structured as a set of information illustrating the main properties of one range or the product viewpoints (figure 1).
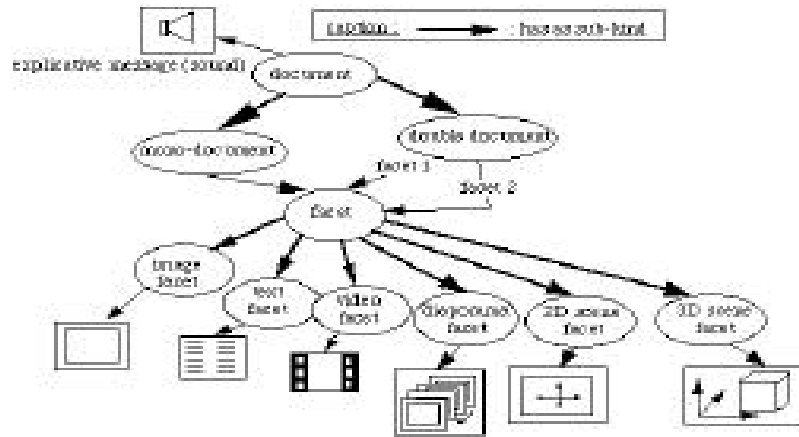
Figure 2 : Document structure.

An information is a hierarchical organization which is defined in the following manner : a piece of information could be either documented - it holds a set of documents - or structured - it holds a set of information where each piece of information could be either documented, or structured .

Although every range or every product has an image that illustrates it, the multimedia information is located essentially on the level of the document held into a documented information. The document represents the elementary information which can be consulted, but also the exchange unit between tools participating in the process of architectural conception. A document can be associated with a sound and have one or two constituent named facets. A facet is linked to a multimedia information : movie, picture, text, schema, 2D scene (QuickTime VR), 3D scene (QuickDraw 3D, V.R.M.L.) (figure 2).

Once the structuring of data obtained , the schema is going to be used as a holder to the construction of the navigation schema.

3.2 NAVIGATION DEFINITION

The navigations that we defined lean on an arrangement of typed nodes. A node allows the user to handle some information through a predefined function. For example, the browsing of a set of documents is going to be depicted with a node whose function is the browsing, and whose information is a set of documents. The set of nodes and their links also define the graph of the states of the hypermedia.

The navigation schema can be built by tracing the chosen nodes on the data schema. The figure 3 illustrates the possible navigation on the ranges and products of a company.
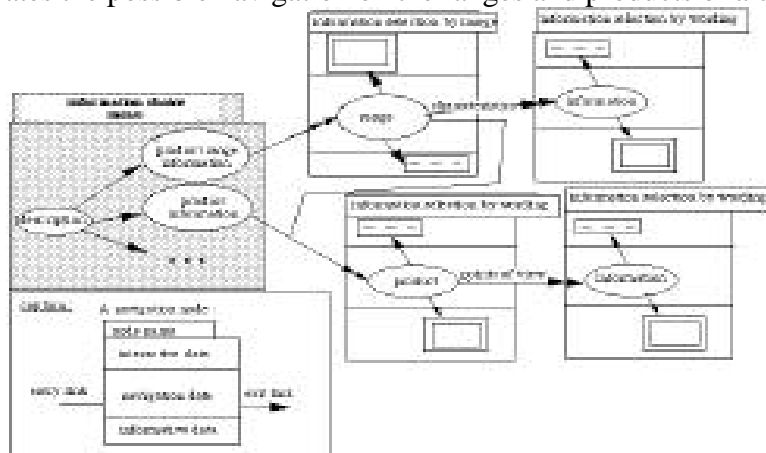
Figure 3 : navigation schema of the products and ranges

The identified navigation are those suggested by the data structure. Other forms of navigations can be proposed in order to improve the access to pertinent information: product retrieval by image, search by navigation through 2D scenes of buildings, component search by 3D product scenes splitting, multi-criteria search ...

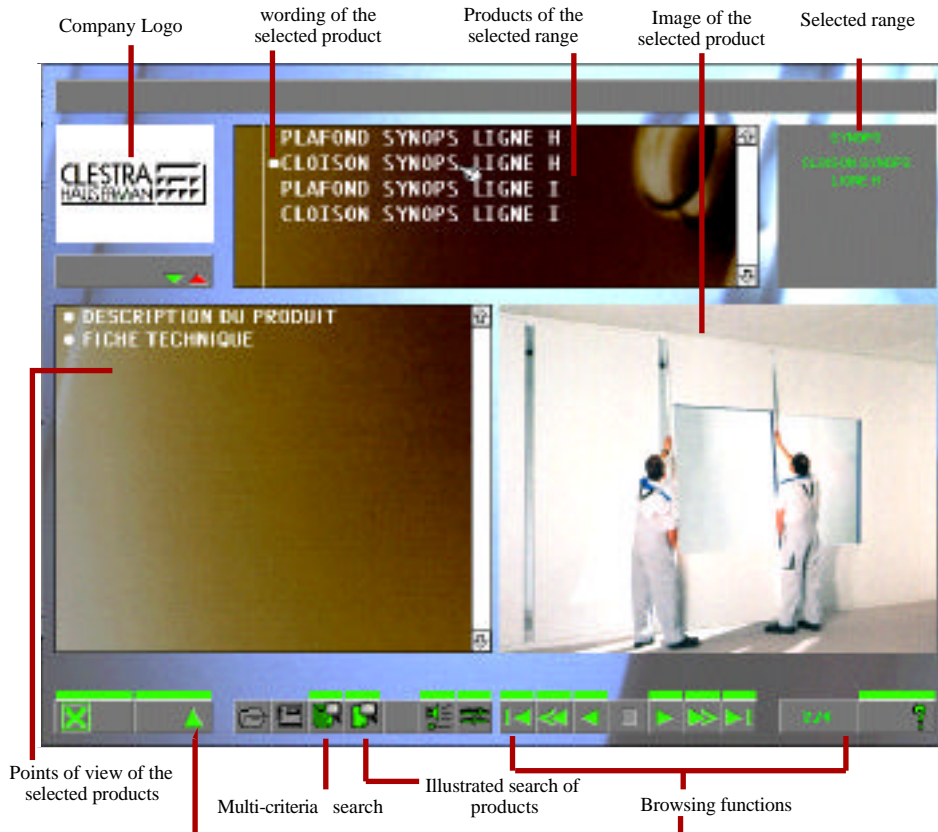## 3. The Domitec Application (User interface Definition)

Figure 4: printed screen of the DOMITEC application.

The DOMITEC application [6], developed in Macromedia Authorware, has been the experiment field of this hypermedia structuring. It contains a part of the functions presented previously. The printed screen of figure 4 shows the user interface definition corresponding to the nodes of the navigation schema presented in figure 3. We can see the selected product by the "big dot" before its name and the display of its image and of its list of points of view.

Conclusion

The hypermedia structuring of the technical documentation and the associated method proposed in this article are at once: independent of available information on products, open because they allow a fine information structuring according to standards in the process of development, evolutive because they make easier the addition of new navigational functions.

These qualities are essential for the data exchange and for the document integration into a design process.

The DOMITEC application - which has been the test bed of our design method - is currently extended to be a WWW application available for all consumer of building products.

References

1. Nielsen J. (1990) Hypertext and Hypermedia, Academic Press edition, San Diego.

2. Garzotto F., Paolini P., Schwabe D. (1995) HDM - A Model-Based Approach to Hypertext Application Design. In ACM Transactions on Informations Systems, Vol 11, n°1, January 1993, pp 1-26.

3.Isakowitz T., Stohr E.A., Balasubramanian P. RMM: A Methodology for Structured Hypermedia Design. In Communications of the ACM, Vol. 38, n° 8, pp. 34-44. August 1995.

4. Schwabe D., Rossi G.Building Hypermedia applications as navigational views of information models. In Proceedings of the Twenty-Eighth Hawaii International Conference on System Sciences. Maui, Hawaii, Jan 1995, Vol. 3, pp. 231-240.

5. Lucarella D. & al., (1993) MORE: Multimedia Object Retrieval Model.. In Proceeding of Hypertext 93, Washington, pp. 39-50.

6. Bignon J.C., Halin G. (1995) Construction d'Hypermedias "ouverts". Application à la documentation technique des produits du bâtiment. Hypertextes et Hypermedias, réalisations, outils, et méthodes. Edition Hermes, Paris, pp 251-261.