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The Bibliographic Hyperdocument: a tool for the Reference Library Service

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Abstract
The access and availability of a large volume of electronic information resources has produced deep changes in the library reference services. However, these services cannot be diseminated intervening traditional librarian techniques. In this article we offer an informative product denominated "bibliographic hyperdocument", and its goal is to serve as an electronic comunication media between the service user and the Internet universe, understanding it like a big whole-world hypertextual and documental space. We denote besides the World Wide Web limitations to offer the features of another conceptual model: the Ted Nelson's Xanadu System.

Keywords
reference services; libraries; hipertext; world wide web; bibliographic hyperdocument

The net as a document space

Internet relies on a big quantity of information servers that exchange many volumes of data between each other, which are interconnected and share some comunication protocols. This outline of infraestructure has been the same since its creation on 1969, but until the present time the net has been developed and changed in an extraordinary way, as for its contents and access manners. The exchange tools of data have evolved a lot, from a simple file transfer until the on-line hypertext, the World Wide Web (the web).

When we just counted on basic tools: telnet, file transfer protocol (ftp), and electronic mail (e-mail), each information server was wired electronically but informatively isolated. The telnet session was the most common way to access the information in these servers, but we were situated in front of a closed-text that only could make reference for itself nor for the outside. With the creation and implementation of gopher in the University of Minnesota, the net began to interconnect the information contents and not only the servers. The user began to "navigate in a transparent way" by the existent information in different places in the world. The arrival of web denoted the incoming of a more powerful technology: the hypertext. With this, it was possible to join together not only a full text but also a determined part or an specific word of this text.

The hypertext, in spite of being an informatic technology, arises like a literary notion. The theoretical and critical field studied this phenomena. Thinkers like Jacques Derrida, Michel Foucault and Roland Barthes have encountered in the hypertext the inflection point where the existent relation between the author and the reader can be reformulated. Barthes, for example, affirms:

> "...what is set in motion in the literary job (the literature like a job) is to make the reader not a consumer but a text producer. Our literature is marked by a pitiless divorce that the literary institution maintains between the maker and the text user, its owner and its client, its author and its reader. This reader is immersed in a kind of leisure, of intransivity and, why not? of seriousness: instead of playing himself, to get a plain access to the enchantment of the significant, to the voluptuosity of the writing, he has no more than receiving or rejecting the text: reader is no more than a referendum. For instance in front of a redactable text its contravalue is established, its negative value, reactive: what can be read but not written: the readable." (Barthes, 1980)

In this work Barthes makes a detailed analysis of a Honore de Balzac's short story titled "Sarrasine". For that purpose he cuts the text into many significance units called "lexias", then he analyzes each lexia separately and establishing the existent relations between each other. In this context, a lexia is like a node of the hypertextual scheme, while the relations are the links. In this way a net is configured and it permits to approach an interpretation based in the plurality of significances:

> "In this ideal text nettings are multiple and play between each other without any of them can prevail on the other ones; the document is not a structure of significances, it is a galaxy of significances; it has no beginning, it is reversible, it can be acceded through many inns without any of them may be declared the main; the codes that it movilizes keep together until losing sight of, they are inexpressible (the sense is never submitted to a principle of decision but the hazard); the sense systems can take possession of the absolutely plural texts, but its number never closes having like measure the infinite language." (Barthes, 1980)

This net of relations not only can be marked inside the limits of a literary or a scientific work, the hypertext goes over the unit text and interconnect it with other texts that at the same time interconnect with many others in a sucessive way until to make a large and complex web. Foucault holds this idea in trying to establish the limits of the book:

> "...the margins of a book are never clear neither severely cut: farther of the title, the first lines and the final point, farther of its internal configuration and the way it authomatizes, it is involved in a data-system of another books, another texts, another phrases, like a knot in a net." (Foucault, 1969)

The hypertext is, therefore, something else than a way of to perceive the complex internal structure of a text, it let us put the interweaving that form the corpus of works and authors in a determined knowledge space. This net are constructed cooperatively by different authors that use the work of their predecessors and that serve as a base for the coming ones. This phenomena has been called social construction of significance:

> "The model of social construction of significance that lies down to the starting point of the hypertext stands out the priority that the language and

> social processes have in the constitution of the sense. At the same time, this model rejects the cognoscitivist epistemology based in a conception of knowledge as a social productivity." (Piscitelli, 1995)

The hypertext is the way through which the social productivity gets explicit. The limitation of the print media has not permitted to put, in an easy way, the "hypertextuality" that lies down in every written-work. The electronic media is the most indicated for this mision, however, Internet it never counted with the necessary tools for carrying it out until the appearance of the web. With it, it is possible to put "graphically" the lying down intertextuality in the written works. Who proposes for the first time this challenge was Ted Nelson, creator of the term hypertext and precursor of the most ambitious computer development of the history: the Xanadu project.

Xanadu is an unfinished project that has taken more than 25 years of work. Its fundamental objective is to create an United Data Structure (UDS), that lets the creation, transference and storage of all the universal information in electronic format. Through this structure it would be possible to get any existent document from any part of the world. This big net are denominated Docuverse and lets through some technologies (bi-directional hypertexts links, transclutions, etc.) to put the intertextual proposal net for the french cited authors.

Web limitations

The World Wide Web is the revolutionary technology of Internet. Its enclosure of application is wide and its growing, nevertheless, it has some limitations and design failures. Amoung its principal critics are found the present searchers of Xanadu project. Andrew Pam, searcher in chief of Australia Xanadu project, says:

> "Although we were on the Xanadu beta team, the software was in the process of a complete rewrite commenced in 1988 and was not at a usable stage. Our intention was always to upgrade to Xanalogical (Xanadu-capable) software, but we decided to start with Gopher and World Wide Web (which, with the advent of Mosaic, had just started to become popular). Tim Berners-Lee had actually been aware of the Xanadu ideas in the design of WWW, and he had incorporated Ted's basic 1965 concept of hyperlinks, though not the later refinements.." (Pam, 1995)

Bernes-Lee, himself, takes this polemic up and affirms emphatically that the web is a system in operation, while Xanadu is only in Ted Nelson's mind:

> "Despite the all too easy criticisms, it must be said the the Web did what no other hypertext system did (with the possible notable exception of HyperCard): it brought hypertext to the large public. And it did so in a pretty nice way, too; I guess not even the harshest critic can deny that the Web is the closest thing to the Xanadu dream other than Xanadu itself; only, no Ted Nelson behind it. Berners-Lee spoke with a very pragmatic, down-to-earth attitude. The Web, he said, is proof that all that was said and written on hypertext in these years is true. Ordinary people, with an average computer literacy, are perfectly capable of using hypertext tools that traverse the Internet in their everyday activity." (Vannini, 1994)

Important thing here is not to try to establish in what a measure the idea of the web is Berners-Lee's original, or not, but to see that web owns similar elements with the Nelson's Docuverse ideas and principles. Docuverse was imagined as the panacea that potentially would solve the problem of wide-world information publishing. The web was conceived originally as a technology with humbler objectives but that has been changing thanks to the massive use of the Internet community. Following it is named some of the outstanding points of Pam's criticism:

- Bandwidth the growing of the net and the requirements of the multimedia information always waste the limited bandwidth resources.

- Mirror copies: it does not exist an authomatic back method and copies by reflex.

- Bi-visibility: absence of hypertextual links that besides of relationing a document with the last ones, in an authomatic form, it does the same with the next documents.

- Metainformation: lack of descriptive and catalographic information of each information resource.

- Transclution: imposibility of virtual documents creation in base of existent documents parts.

- Transcopyright: absence of copyrights solved in a cooperative and distributed way.

The web is clasified as a first generation recovery information system. Any system that has web characteristics and solves all points named above would be considered as a second generation system. Even its application is not found very extended, at the present time there is a system that complies with these characateristics: the Hyper-G, a developed system in the Institute for Information Processing and Computer Supported New Media, Graz University of Technology, Austria (http://hyperg.iicm.tu-graz.ac.at). It is completely compatible with Internet and allows access to information sources (multimedia) in technologies like gopher and web. In its development it to keep in mind a lot of the Nelson's ideas, that is why the system is better than web.

The main advantage of a second generation system is that it allows to set in a in a concrete way the intertextual net that join the scientific documents. This net provides information retrieval, for example, it is enough with detecting an important document on a specific subject for being able to develop (through hypertextual links) the relation with other similar documents. Actually, the web information is duplicated and fragmented. Detecting a relevant document does not warrant it to be able for getting access to other similar ones because the links between texts are poor and incomplete. Since in an authomatic way, it is impossible to carry up this job, it is necessary a human contribution that introduces an added-value to the information that the indexes of the net bring.

The librarian´s role

The sheer volume of material available on the Internet is enormous, and continues to expand atan alarming rate. But to the librarian this information is of little use unless it can be organized and thus be readibily accessible. The Internet may be compared to a large library without a catalogue, whose stock is unclassified and randomly shelved (Johnston, 1998). The problem's solution is in trailing the relations between the documents and explaining them in a new guide-document. This document will have bibliography features and besides will show hypertextual links, so the hyper-bibliography will be denominated "bibliographic hyperdocument". The prefix hyper designate for its hypertextual feature and the adjective "bibliographic" indicates that it is a question of a secondary document that makes reference to other ones, of a primary character. The construction of a hyper-bibliography cannot be realized in a totally authomatic way, that is why it had to be carried up for only a person. The more-indicated professional for this job is the librarian, since he presents some outstanding characteristics:

- Knowledge of the bibliographic compilation process.
- Management of informatic tools.
- Capability for describing and evaluating information resources.
- Knowledge of the hyperdocument potential user needs.

User profiles

Actually the beginner-user does not necessarily needs to understand all Internet basic tools. It is enough he has an inteligent handling of the web for he can develop the majority of the net resources. This is because of we will propose a series of user profiles in functions of the capabilities the user owns for the web controling, and we will divide three different levels: beginner user (level 1), intermediate user (level 2), and expert user (level 3). These levels can be shown in a chart such as we can see in Figure 1, the quantity of users in each level is generally inversely dimentional to the complexity of the existent knowledges in each level. Following all knowledges and inherent aptitudes for each one are detailed.

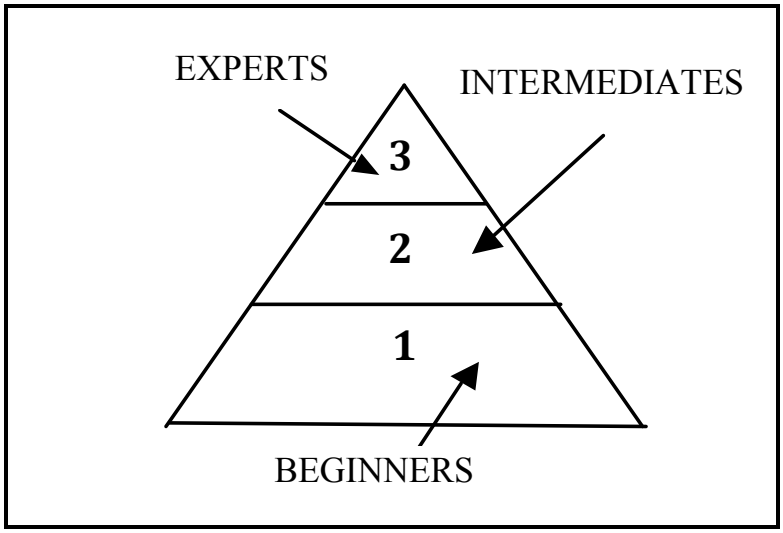

Figure 1 - Pyramid of users

Beginner User or First level

This user is who just begins with his first steps in the web. However, for being considerated a first level user it is necessary that he has the basic knowledge for doing the following tasks:

- Manage operative-system environment.
- User basic navigation tools of WWW browser.
- Print information from different applications.
- Identify the pathway of resources into the net (URL).
- Be able to use a bibliographic hyperdocument.

In case a user does not have these aptitudes, he must be considered as a web pre-user. For this pre-user becomes a beginner-user only needs a rapid training so it will take no more than many hours. When all these tasks were done easily, the user is ready for getting a higher level.

Intermediary User or Second Level

The second level user must realize, of course, all tasks listed in the first level and the following:

- Use and explode all different directories and search engines from the net: Lycos, Yahoo, Altavista, HotBot, etc.
- Send WWW pages via e-mail.
- Knowing the basic commands and structure of HyperText Markup Language (HTML), with the utilization of an HTML editor.
- Be able to modify a bibliographic document.

These jobs are more difficult than the last case, so its operation requires much time and a lot of practice. In case of having the knowledge and the wish for keeping on, they could get access to the third level.

Expert User or Third Level

This is the last of the levels, the tasks indicated before must be added to the next ones:

- Knowledge of UNIX Operating System.
- Ability for expert-programming in HTML.
- Capability for creating their own referential hyperdocuments.
- Knowledge of Common Gateway Interface (CGI).
- Knowledge of Javascript, VBScript, and Java.

The bibliographic hyperdocument

Once treated previous matters, we are in conditions for presenting a more exact definitions of our tool:

"The bibliographic hyperdocument is an electronic document in HTML format, that contains a list of resources on Internet information located, evaluated, described and compiled by the reference librarian for a particular user or a group with common interests. The librarian must have a third level knowledge profile, while the users will be normally from the first level. Besides, is pretended that the use and eventual modification of a hyperdocument inspire the users in using the net and so the necessary interest for their technical knowledge improvement be generated." (Herrero, 1998)

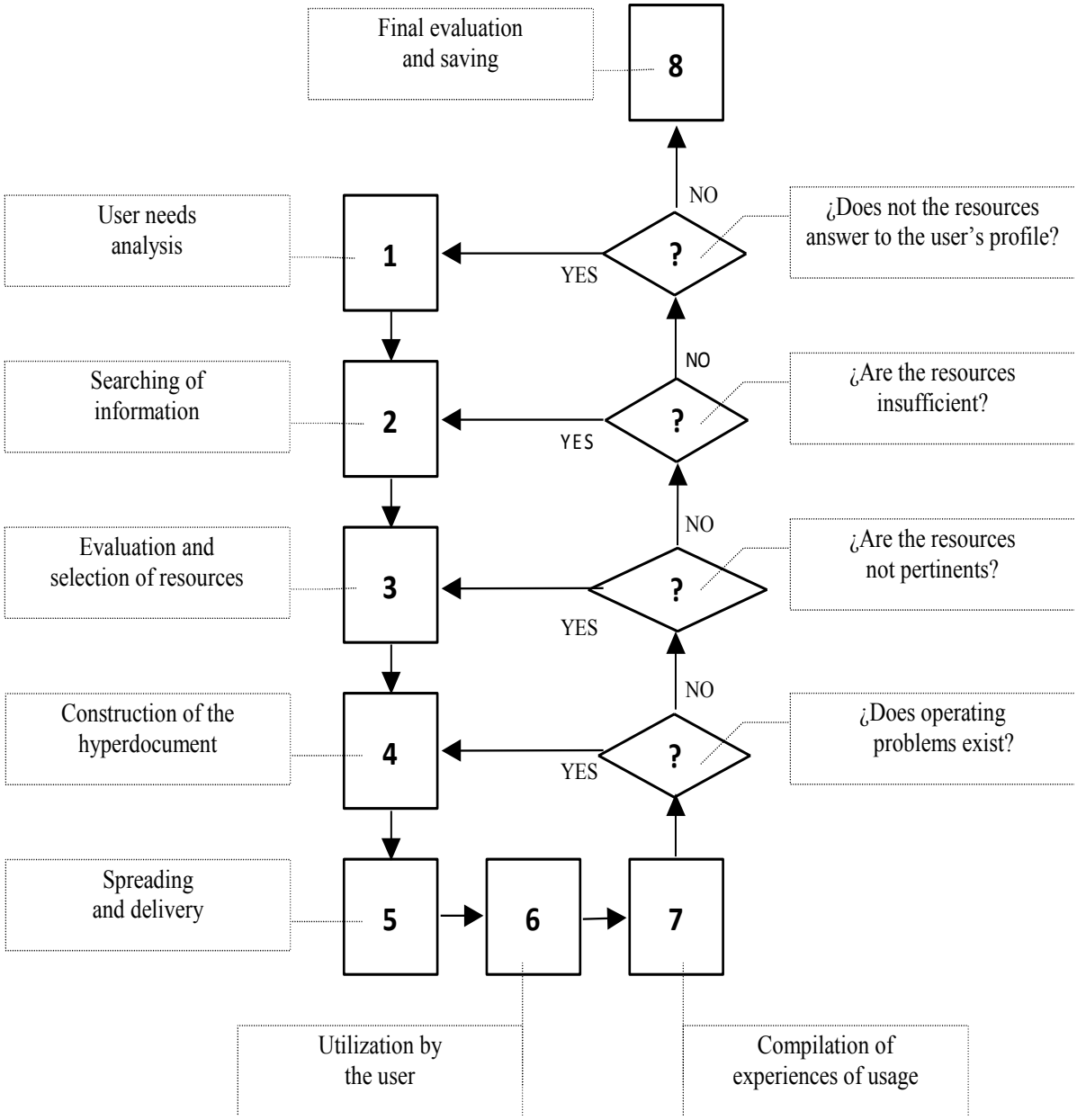

Figura 2 - Bibliographic hyperdocument, flowchart creation process

The creation process of this tool can be view in figure 2, within is denoted the eight general steps to follow: 1) user needs analysis; 2) searching of information; 3) evaluation and selection of relevant resources; 4) construction of a hyperdocument; and 5) spreading and delivery to the user. Two more phases appear later: 6) utilization of the hyperdocument; and 7) gathering user experiences, in this way it can be measured the success grade that hyperdocument has had, through the formulation of four basic questions, in order to detect which of the first four phases have failed, and in that case to find at least an affirmative answer. It will be necessary to realize again the process from that phase on. If all answers are negative the next step can be done: 8) final evaluation of the experience and saving of the hyperdocument. In this step is important the librarian-user communication and the user-user communication. Aside from the more familiar types in inter-user communication (mailings, chats, etc.), we intend to explore the potential of the users themselves as sources of information with a significant added value: the value derived from one´s own experience using the service. The interchange of this particular sort of information reinforces the sense of "bonding" between user and medium. In this way, the system eventually becomes the user´s "territory," so to speak (Herrero, 1996).

Conclusion

The application of the hyperdocuments to a determined library is going to be condicionated by the own-library characteristics, although in this article only have been taken general considerations for its creation. As a final consideration we think that what is really important in each context is the role that the information-professional has attached. We believe that not necessarily a deep change must exist in such role for it can profit the benefits from the new information technologies, but only needs to count on new tools designed according to new information services. The new professional has not to be like another professional, he must be the same but with modern instruments that give him some power.

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