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Survey on Electronic Newspapers

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1. Introduction

Newspapers across the globe are turning their sights on producing electronic versions of their daily and weekly editions. With home penetration of PC's forecast to expand by as much as 23% worldwide in the next four years, with more than 200 million people accessing the Internet by the end of the decade, newspapers cannot afford to ignore these alternative paths to information delivery.

Newspapers are looking to the Internet as a means of attracting new readers, securing customer satisfaction among current clients and increasing revenue with new services. Publishers also hope that their entrance into Internet may help papers struggling with an aging and declining readership. The Newspaper Association of America (NAA) predicts that on-line editions, audio text and video text will *supplement*, not replace, the printed newspaper.

As of November 21, 1997, the Editor & Publisher Interactive Online Newspaper Database has 2,560 online newspaper entries (see http://www.mediainfo.com). The number of online newspapers (daily newspapers *and* others) on the Internet's World Wide Web is currently 2,445. There are about 24 online newspapers in France, 42 in Germany and about 50 in England.

This paper is a short overview of the current work in electronic press services. We first talk about the specificities of electronic press services with respect to traditional paper-based newspapers (Section 2). In Section 3 we present the electronic newspaper developed by Ouest France and called ETEL. Section 4 presents briefly ETEL++, the version of ETEL built over FollowMe. Finally, Section 5 concludes this overview.

2. Electronic Newspapers

## 2.1. What is Specific to Electronic Press Services

The traditional, paper-based, version of a newspaper is somehow similar to its electronic counter-part in the sense that both offer to a reader *selected* information presented and organized in a *specific* way. It is unlikely to find information in the electronic version that differs radically from what is printed on the paper. There are, however, many difference between the electronic and paper versions, and highlighting some of them is the purpose of this section.

A first difference is the opportunity for easy navigation between articles. This well-known feature corresponds to the notion of navigation via hyperlinks in hypertext documents. Another difference is the layout of electronic articles, which usually differs from the one used for the paper edition. First, the size of the screen is likely to be much smaller than the size of a typical sheet of paper. In addition, paper and electronic versions have different physical orientations: papers are usually in a portrait mode; screen are landscape-based and the pixel definition of screens is poor with respect to the quality of today's professional printers.

In general, the layout of an electronic newspaper is based on the notion of blocks, each block being composed of other nested blocks, titles, headers, pictures, sections, paragraphs, etc. Two basic approaches for the layout are commonly used today, and they differ by the way blocks are generated. The first approach creates blocks that simply depend on the actual size of the electronic page as well as the volume of information kept within each block. The resulting layout is horizontal, and a typical example is given Figure 1.a (see also http://crayon.net/using/sample, http://www.telegraph.co.uk, http://www.welt.de). The second approach creates blocks depending on their relevance and also on the relationship they have one another. Two blocks that contain tightly related articles are likely to form a new block by itself, while two articles that share only little are likely to be apart. The layout of the blocks within the electronic page reflects somehow this notion of relevance: related blocks are juxtaposed. Figure 1.b is an example of this layout (see also http://www.washingtonpost.com, http://www.liberation.fr). This second type of layout is the one generally adopted.

It is fairly complex to create a layout that nicely displays the content of a newspaper. The service provider has to support multiple end-devices with different resolutions, sizes, graphical capabilities, etc. Furthermore, the layout for each day depends on the actual content of the information provided by the newspaper. The automatic computation of a consistent, meaningful, nice and easy-to-use lay-

out for the electronic version of a daily newspaper is still an issue – today, specific teams have to recompose electronic pages using their paper-based counterpart.
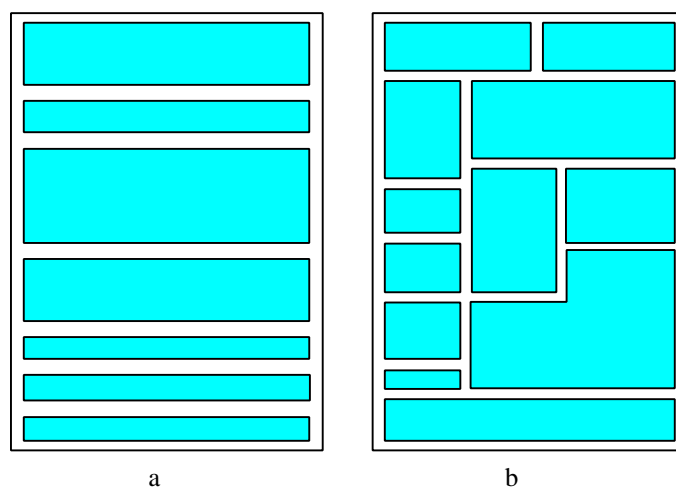
Figure 1: Two Common Layouts for Electronic Newspapers

Another major strength of electronic newspapers is the possibility to support the creation of personalized newspapers by allowing customers to determine which sections of the news they want to receive on a daily or even hourly basis. Related to this type of value-added features that can not be achieved easily with the traditional paper-based newspapers are fast and easy access to the archives, high quality for pictures (that can be in color, as opposed to the typical black-and-white pictures of papers), support for multimedia data, instant updates and news flashes, gateways to other services like ticket booking, etc.

2.2. Different Types of Electronic Newspapers

There are today basically three different types of electronic newspapers: (i) electronic newspapers built from their paper counterpart as a base, (ii) electronic newspapers built from a collage of various articles available online and (iii) electronic newspapers built from scratch. While the first category encompasses many major news providers (see http://www.washingtonpost.com, http://www.lemonde.fr, http://www.nytimes.com, http://www.liberation.fr, http://www.welt.de), the second and third categories deserve special interest.

An excellent example of the second type of electronic newspapers is CRAYON (see http://crayon.net). CRAYON repackages existing news offered on the Web for free, that is, CRAYON is pasting-up news found all over the net. It allows a user to customize his interests and save his choices. With CRAYON, the user has to choose which areas the personalized newspaper will cover. Typical areas are US News, Regional and Local News, World News, Politics, Editorials and Opinions, Weather Conditions and Forecasts, Business Report, Arts and Entertainment, New and Cool Web Sites, ... To each area corresponds a certain number of information sources, each accessible by a hyperlink embedded within the CRAYON page. After selections of areas and specific sources has been made (e.g., CNN US News versus ABC News to get news about US), the next step is to specify in which order the areas of interest will appear in the paper. The potential problem

with this service is that it relies upon the availability of all the news sources on the Web for free. In March 1996, CRAYON encountered this problem when PhillyNews limited access to comics like Doonesbury for subscribers of their for-charge service only. Thereby CRAYON-created papers had no longer access to the comics. An example of the last category (online papers created from scratch) is the Nando Times in the United States. The Nando Times has no existing printed product.

2.3. Different Types of Access to the Information

Regardless of the way the electronic paper is built, its contents might be subject to specific policies offering a more or less restricted access. In general, three different categories of access to the information exist today in the context of electronic newspapers: (i) completely free access to the information, (ii) free access with prior registration and (iii) access for a charge. As of now, the majority of services offer free access to the information. What the user can freely access, however, can be a restricted set of the information provided by the (paper-based) newspaper – full access being possible with a fee. A lot of papers, however, offer free and full-scale access to the information.

Free access with user registration (including username and password) is also quite popular. User registration serves the purpose to learn about the users. Many sites that carry advertising require readers to fill in a registration form, which then enables the site managers to figure out who is accessing the site. The problem is that the registration deters people, so although more information is gathered about those people, the actual numbers are reduced.

Some approaches get around the registration problem in an interesting way. The site offers brain-teasers, trivia questions, graphical puzzles and riddles with cash prizes for the first people to solve them. As players work their way through the pages, they are exposed to advertisements and demands to fill in demographic details.

3. Ouest France Online: ETEL

Ouest France is the largest regional daily newspaper in France. Every single day, 40 different editions are printed, that is, about 400 pages (one edition is around 35 pages), 1,500 pictures, 2,500 articles (around 125,000 lines). More than 800,000 copies are sold every day. All the different editions share a common set of pages (e.g., national and world news, business, ...). One edition, however, differs from the other because each contains a set of specific pages giving very detailed local news.

The creation of an online version of Ouest France was initiated in October 1995. It is called ETEL. The ultimate goal is to offer to subscribers, around 1999, an online access to Ouest France, with value-added features like personalization, multimedia, gateways to related services, access to archives, digest, etc.

Since subscribers will be charged for using ETEL, enforcing the quality of the provided service was a major concern, and had an impact on all layers of the design. In this context, the quality of service has two meanings: (i) quality of the provided information and (ii) quality of access, that is, availability and fast response times [BIL96, BILC94].

For the quality of content, the design includes the following features:

- Coupled production of paper and electronic editions, i.e., production of the two versions from the same data. ETEL is one of the first electronic newspaper able to automatically build an electronic edition from the edition's logical data that are also used for the construction of the paper version.

- Customization of the electronic edition according to the user's particular interest, also known as the user's profile. Profile allows a user to compose its own personnel edition with respect to his centre of interests. Graphical tools help the user to specify which thematic areas and which geographical areas the personalized newspaper will cover.

- Presentation of the information that combines the advantages of both the paper version (e.g., layout) and the electronic support (e.g., interactivity), including the integrated view of newspaper-based information and links to various services. An extensive work has been done so far to preserve as much as possible the actual look of the paper-based newspaper once displayed on the screen.

For the quality of access, the design includes the following features:

- A profile-based predictive prefetching policy that tries to anticipate the user's requests based on his/her profile.

- A profile-based load balancing policy that creates group of users on ETEL's servers. The users in each group have close profiles.

A prototype of ETEL is now fully functional. It is possible to automatically generate the electronic version using the raw data provided by the journalists, it supports multi-dimensional customization in profiles, it works in a client-server based environment. The current work focuses on subscriptions, collection of fees, access to archives and related value-added services (travelling, advertisements, news digests, gateways to the Web, full support for multiple media, ...) and the deployment of a full-scale system over the Internet in order to support a large number of users and a significant load for ETEL's servers.

4. Towards Etel++

ETEL++ is one of the pilot applications that will be implemented on top of the FollowMe platform. Because ETEL is a very complex, professional application, ETEL++ will only support a small number of the features existing in ETEL. For example, the automatic generation of the electronic edition will not be part of ETEL++. A simplified version of profiling, however, will be supported in ETEL++. ETEL++ will also differ from ETEL because it will make an extensive use of *mobility* and *agents*.

Agents are useful in breaking down the traditional client-server model on which ETEL is based. Agents increase the level of autonomy of the various components of the system, and may help when the scale of the system will grow. Mobility will enable to deliver information depending on the location of the user. Also, the mobility of the information may help in enforcing the quality of access in the sense that moving the information between geographically distributed sites in order to follow the users (for example) becomes simple.

ETEL++ is also concerned with the multi-terminal support provided by the underlying FollowMe platform. Allowing access to the service via a large set of terminals, each differing in their physical characteristics, increases the visibility of Ouest France.

5. Conclusion

The world of electronic newspapers is evolving rapidly. It is predicted that electronic newspapers will become a source of big money. Premium services, like personalized newspapers, access to archives or multimedia support are an area of incredible growth opportunity for publishers and advertisers. Advertising revenues from the Internet and on-line services totalled about 55 million dollars world-wide in 1996 according the Jupiter Communications. Analysts predict it will rise to 343 million dollars this year and 5 billion dollars a year by the end of the decade.

In general, electronic newspapers are good applications when one need to show the performance of a large scale distributed system. The number of users to cope with, the volume of data to manipulate, the frequency of updates, the multiple medias to support, the response times to enforce, all those constraints are highly demanding, and offering a good "quality of service" is a real challenge. FollowMe and ETEL++ are part of the game.

6. References

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