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Evaluation of ETEL++

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1 Introduction

This document gives an overview of the lessons steaming from the use of the ETEL++ pilot application. It briefly restate what where the goals of the application and how they have been reached. It then presents the added value resulting from the use of specific features provided by ETEL++ and summarizes the potential of using new technologies as the ones used in the context of FollowMe.

2 The Goals

As presented in the Document DJ2, one goal of ETEL++ is to go over some limitations that are inherent to ETEL (recall that ETEL is the current electronic press software product developed by TCM, while ETEL++ is more an avant-garde prototype to experience with new technologies). The limitations and the contribution of ETEL++ have been detailed in the mentioned document. We therefore only give here a brief summary of the potential of ETEL++ with respect to ETEL:

- Large-scale distribution, using service deployment in order to take into account the processing power of any provider and user's terminal, instead of traditional client-server architecture which increases bottleneck and performance risks.
- Multi-terminal support, allowing access to news via a laptop, a notebook, a phone or a fax instead of being limited by one dedicated interface as for ETEL.
- Agent-based interaction, and services interaction to allow the discovery of local services that may interest users, according to their personal profiles, when users travel.
- Pull- and push-based data delivery facilitating the deployment of ETEL++.

3 ETEL++ Main Components

We highlight here some features of ETEL++ that are good candidate for being reused at TCM in our products.

3.1 XML-Based Format for the Data

Right now, it is possible to point the advantages of this choice. In the context of Internet and the huge amount data-flows crossing information systems, XML is a convenient way for modeling and encoding data. XML gives opportunity to store and describe data in a way close to browser capabilities (like Netscape Communicator, Internet Explorer) which allows viewing data described in XML files. This capability, enforce our choice.

The most important part of our work at TC Multimedia consist in manipulating raw data between information databases, and to compute this data in order to produce multiple layout, thus XML gives the opportunity to distribute raw data with rules according to needs of users, in a single file.

The first result of these advantages is currently under implementation. News written by journalists will be stored in Ouest-France database in XML format and 2 kinds of rules would be added to raw data, *i)* paper publishing counterpart interpreted by Quark Xpress software, *ii)* electronic publishing counterpart for internet browser. At least XML associated with Cascading Style Sheet gives facilities for rendering editorial data.

3.2 Distribution and Persistency

The main difference between ETEL and ETEL++ is the architecture of the system: ETEL is client-server with a central database while ETEL++ is a distributed application. Augmenting the distribution level of our software is essential because of the expected amount of data that has to be delivered to users. We expect to have about 50.000 electronic end-users (as opposed to the 2.200.000 readers of the paper version). Each electronic end-user is likely to read on average 10

articles referencing 5 different high-resolution pictures. The volume of information to send to each electronic user is therefore roughly of 300Ko, and of about 15Go for the complete electronic readership. It is essential to note that 80 % of these 15 Go of data will be accessed between 8:00 and 10:30 am.

To cope with such a large load, we can evaluate what could be the correct dimensioning of our architecture at Ouest-France (what should be the minimum CPU-power and the minimum amount of RAM required, as the minimum network bandwidth required) in order to enforce the quality of our service. Note, however, that after having determined the appropriate architecture, the server and the Internet connection would be under-utilized 80 % of the day. Bottlenecks are therefore likely and availability of the service is therefore endangered only during about 3 hours each day. It should be apparent that setting-up such an architecture would induce tremendous costs and the return of investment would be small, given the under-utilization of that architecture.

An architecture similar to the one adopted by ETEL++ seems to be more appropriate. Distribution is used to a larger extent, which tends to increase the utilization ratio of each server and each link, instead of relying on a centralized and fragile architecture as for ETEL. Being able to utilize the CPU of multiple secondary servers geographically distributed is clearly an contribution that will be transferred in ETEL. In addition to the obvious advantages distribution offers with respect to minimizing response-times, it increases also the level of resilience of the system since multiple node storing possibly redundant information are less likely to fail simultaneously.

The Application Programming Interface provided by APM hides some of the difficult issues regarding distribution and persistency. It is therefore easy for ETEL++ to manipulate data irrespective of its physical location using the mechanisms of the MOW. Facilities for persistency is used for every single document managed by ETEL++ which could be copied to or from any server of the FollowMe system.

It is important to note that such ease is possible because ETEL++ uses Flexinet. Therefore, transferring distribution-related ideas in ETEL requires thinking about the low-level platform to use. Using Flexinet could be a possible limitation because of the costs of licenses.

3.3 Information Space and User Profiles

Without using information spaces and user profiles, the most important part of ETEL++ that optimizes the delivery of data from Ouest-France to the end-user, is broken-down. User profiles are used to store data about each individual user: center of interest, future locations, type of terminal... These information are stored using the facilities of the information space. The exploitation of this information is very important, it minimizes the computing phase of the articles, and increase the availability of data by pushing them close to user location.

Transparency of the connection to the profile manager is an important feature for ETEL++ end-user which may use any kind of terminal in order to get information from ETEL++ or to update its profile.

3.4 Deployment

To enforce quality of service requirements (minimizing response times, increasing availability) ETEL++ must be deployed appropriately. In order to take the right decisions, ETEL++ needs to check the performance of all the servers involved in its distributed architecture. The performance of servers is obtained by the means of the Service Deployment workpackage.

The Intranet of Ouest-France is composed of servers localized in each of the 40 agency of the western part of France covered by Ouest-France. In the future these servers could become part of ETEL++ distributed system. Having information about bandwidth between machines, amount of CPU available or free space disk, is very important for optimizing the deployment and to avoid possible conflicts between some processes like processing pages in the evening, managing documents for journalists in the afternoon...

The deployment of ETEL++ is a manner to distribute the different flows of data between servers that are in the FollowMe system.

As described in the document DJ4, a possible weak point of ETEL++ architecture is the main server (figure 1 DJ4) from where all the data are available every night. Using distributed system with secondary servers, the deployment of ETEL++ at given hours in the night when both CPU and bandwidth are both not bounded reduces risks of having just one server in front of thousand of readers in the morning. Therefore secondary servers located closely to user decrease the possible performance fluctuations that may occur on the network.

3.5 Agents

For ETEL++, agents and interactions of services provided by UWE are of a great interest. For TCM multimedia it is certainly the most innovative technology used during the FollowMe project. Using agents ETEL++ can translate static information into context-sensitive data, in particular weather forecast in our demo.

The concept of agents is very interesting in the domain of the electronic press publishing, which is the core of our activities. It is much more difficult to be recognized as a news provider on the Internet, than as a press editor, because of the multiplicity of sources (due to facilities of diffusion i.e.: a printing press is much more expensive than a web-server!). Autonomous agent could be invoked to discover external services which would be able to produce complementary information (Les Echos, the Financial Times) to news given by Ouest-France. The point which we believe in for the close future, is the possibility for ETEL++ to give an overview of its features and a description of its contain to enforce the visibility from other services on the

Internet and search engines in particular. Mission scripts agents and XML formats are a good vector to exchange data between services and end users. Another mission we can imagine in our domain is to determine the confidence-level we can assign to the different sources found on the Internet by crossing references, and then we should be able to classified services in "you can trust me" category.

Limitations of this point of view, is of course the lack of generic description, which could be interpreted by large scale of services.

3.6 User-Access and Support for Multiple Terminals

For the first time, in 1998, the flow of data around the world has been greater in volume than the flow of voices. More and more end-user wants to access his data, from anywhere at any time. The User-Access workpackage provided convenient tools that facilitate the production of multi-terminal newspaper editions, and therefore makes possible for readers to get news on multiple devices. However, the difficulty for integrating so many work-packages in such a short time frame has restricted the number of devices we defined. With more time, we would have like to implement audio-based devices such as supporting the newspaper over a phone (of a great interest for the blind people) or making possible automatic translation for foreigners.

Note, however, that numerous new Java-enabled devices have appeared on the market, long after the beginning of the FollowMe project, and this fact shows that our ideas and choices are the good ones.

4 ETEL++ exploitation

The major targets of TCM exploitation plan, are Ouest-France and its partners of the French SPQR (Daily Regional Press Society). At the beginning of FollowMe project some presentations giving an overall description of the concepts, or addressing potential customers to get their expectations in regard with their further project have been done. Last three months, with the prototype we have made a few presentations to get the feed back concerning ETEL++'s features.

Four principal features close to concerns of our public, were highlighted :

- 1) multi-terminal support, with the possibility to get one's own edition by e-mail or with a classical web browser,
- 2) deployment of ETEL++ when the server which provides the news is Cpu-Bounded, Network-Bounded or both
- 3) user profile and off-line on-line delivery,
- 4) context sensitive data, illustrated with location dependency of weather forecast,

The more relevant features to most of our partners have been the deployment of ETEL++, then multi-terminal support because it is the core of their activities. User profile is interesting for the capacities to prepare editions before user's connection, and off-line was an interesting feature for Atlantel with the sample of the user who wants to read news-paper on its note book during his travel to Paris by train. For context sensitive data the principal remarks fit in what we said in §3.5, discovery of new services is limited by the lack of generic description.

<i>Date, Location</i>	<i>Participants</i>	<i>Remarks</i>
19 rd of February, Rennes	Ouest-France () Jean-Paul Boucher (Technical Director) Alain Duval (Dmpao Manager) Bruno Patillon (Account executive)	2) Service deployment (+++), 1) Multi-terminal (++), 4) context sensitive data (+), 3) user profile (+)
23 th of February, Rennes	Atlantel (Multimedia Subsidiary of Sud-Ouest second major french regional daily newspaper after Ouest-France) Jean-Louis François (Director) Bernard Lafitedupond (Technical Director)	2) Service deployment (+++), 1) Multi-terminal (++), 3) user profile (+) off-line delivery (+) 4) context sensitive data (?),
30 th of March, Rennes	Le Parisien () Denis Williams (Multimedia project Director), Bertrand Dietz (Advertising director)	2) Service deployment (++), 1) Multi-terminal (++), 3) user profile (?), 4) context sensitive data (??),
10 th of March, Rennes	Dernières Nouvelles d'Alsace () Michel Landaret (Technical Director)	2) Service deployment (+++), 1) Multi-terminal (++), 4) context sensitive data (+), 3) user profile (+)
25 th of March, Rennes	Le Marin () Rudolph de Loynes (Chief redactor) Patrick Bernard (Technical Director)	2) Service deployment (++), 1) Multi-terminal (++), 4) context sensitive data (??), 3) user profile (?)

5 Conclusion

Integration of all these components and all these technologies in ETEL++ pilot application has been a quite hard work in so little time because of the scheduling constraints. But ETEL++ succeeded its challenge, and shows that it is possible to use these new concepts to produce an electronic newspaper and to give solutions to problems that preoccupy most of our partners of the press-publishing world. Each of these partners keeps in mind the great success of our web site "<http://www.rhum98.com>" giving news about the famous sailing race between St-Malo and La Guadeloupe last winter, and its 2.5 million sessions performed during November. Both server and Internet connection were bounded every morning between 8 and 12 am. We had to double the size of our architecture (servers and links) in emergency to absorb the flow of queries. This increase was not sufficient to cope with the demands, and we experienced many performance problems.

Most of our applications are based on traditional client-server architecture. That is why Ouest-France, Sud-Ouest, Le Parisien, and Les Dernières Nouvelles d'Alsace (all these are French newspaper trying to set an electronic version of their paper) are interested by the techniques used in the ETEL++ prototype.