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Pedagogically sustained Adaptive LEarning Through the exploitation of Tacit and Explicit knowledge

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D.PAR.04 – User Centred Description of PALETTE tools and services and first analysis of usability

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Summary

The present deliverable aims at providing any CoP member, CoP animator or CoP mediator with the most complete view of the PALETTE tools and services. It gives a voice to the developer, the educationalist, the ergonomist and of course the user to explain how they consider them. So, it suggests use cases, scenarios but also shows to the reader where are the obstacles of use (with the aim of avoiding a too quick discouragement on his/her part) and it provides real users' testimonies.

It illustrates the participative design, core of the project, by showing how various kinds of partners in the project work at their evolvment. Several times, it evokes how they interact in that way.

More, for the sake of completeness, external services which are "social network" oriented, are described in terms of functionalities and with the concern of providing the audience with a largest view of how ICT may help CoPs to grow up.

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1 Introduction

1.1 The PALETTE project

1.1.1 Tools and services

The tools and services described in the first part of this document are those developed inside the PALETTE project. The distinction between tools and services is rather subtle. Let us simply say that a tool is an application that can be installed on a personal computer. We will call "service"¹, a Web service, *i.e.* an online application, and thus available through the interface of a Web browser. This deliverable discusses six tools and services respectively named: Amaya, SweetWiki, CoPe_it!, LimSee, eLogbook and BayFac. Let us consider that Amaya and LimSee3 are presently tools. So the others are services. The PALETTE project aims namely at improving some existing tools and services for increasing interactions, cooperation, knowledge management and collaborative learning within the CoPs. Among the tools and services we describe, Amaya, SweetWiki, CoPe_it!, and to a smaller extent LimSee2, already existed at the beginning of the project. For those, the work basically consists in improving them. Adapting them taking the CoPs' life, their members' habits and the problems they encounter into account, is a real and interesting challenge. But the PALETTE project also intends to develop new services, which is a very delicate task because it requires an even more important closeness to the needs of the CoPS. eLogbook and BayFac tend to do so.

1.1.2 Participative design

The partners in this project, developers, educationalists and other specialists build and rebuild in a collaborative way these tools and services that claim to be both useful and usable. To do so, they imagine relevant learning patterns and have them validated by the members of several CoPs. Exactly as the presentation of existing tools and services is a good means to help describe relevant using patterns, the description of rather general using patterns is also a good mean to help improve these services or to create new ones. In a perspective of a participative design, the CoPs members can thus help the partners, first to validate, and next to evaluate the implementation of the patterns offered. Ideally they should be able to offer patterns on their own, but their weak knowledge of the PALETTE services does not really help them to do so. That is the reason why they need significant information about them.

This deliverable is dedicated to the CoPs' members and all the persons who help them to open up. We hope that a good knowledge of the services on the part of the potential users of such services will lead to their improvement, but will also contribute to their acceptance as well as to the adoption of innovative and efficient practices from the point of view of collaborative learning.

1.2 Objectives and structure of the document

While composing this document, we took care to talk directly to the potential users of the PALETTE tools and services. These are, first of all, the CoP's members, their animators and mediators. Within the strict context of the project, the CoP's mediators are the persons who act as an interface between the users and the developers in the widest sense (computer scientists, but also educationalists).

1.2.1 Different views

Did we have to adopt a neutral profile in our concern of objectivity? We have to admit that the variety of the PALETTE actors (educationalists, computer scientists, sociologists, CoPs' animators and members) is as large as the diversity of their respective interests. People taking part in the PALETTE project may have different views of a service. The developers build tools and services imagining (sometimes roughly) what the use of them should be like, answering to needs or foreseen innovative

¹ This definition is a bit more general and slightly different from the detailed definition you can find in D.IMP.03 section 2.

uses. Learning specialists try to discern from a bit closer which profits the learners could draw from the description of use patterns leading to interesting learning moments. Ergonomists take an interest in their usability that, if too little important, acts as a brake upon their use. Since the users are the ones who, at the end, will make the tool or the service successful, it is important to take into account not only their needs but also how they effectively understand and use these products.

This is the reason why we chose a particular strategy, presenting for each tool or service four points of view as we sensed them. According to what precedes, we adopted the following ones: the developer's, the educationalist's, the ergonomist's and the user's.

To make our status as users credible, we decided to use these services as much as possible while carrying on our daily work. In this way, it was not a question of testing them strictly speaking, but a question of measuring their utility and their usability more finely. The team of people who examined the tools is an interdisciplinary team including educationalists, sociologists, computer specialists, and users sensitive to ergonomics.

Finally, we have to inform the reader that scenarios described in the educationalist's view are author-created ones. The purpose is to ask an educationalist which kind of learning scenarios he/she imagines knowing the tool or service. Then he/she is asked to analyze some relevant practices he/she has in mind allowing him/her to evoke strongly or weakly developed functionalities and to make links with learning theories.

1.2.2 Global structure

The **first part** of this document sums up the description of six of the PALETTE tools and services: Amaya, CoPe_it!, eLogbook, LimSee, SweetWiki and BayFac according to each of the views considered. To be more objective, we will state that not all of them were used as intensively. This is mainly due to their different levels of achievement. Some tools or services are indeed usable and have sometimes been used for several years. Others have only been developed for a short time and the users still interact regularly with the developers in their concern of participative design. Nevertheless, we did not want to pay attention to the products of the PALETTE activities without having a look at the outside. So, starting again from the use patterns established, some of us concentrated on the services and technologies outside PALETTE, so as to check how far these services could bring them an interesting counterpart.

The **second part** is structured in a different way because it does not aim to describe the services outside the project in the same way as the PALETTE tools and services. However it usefully complements the first part. In the **conclusion**, we will suggest a few leads as to the way the CoPs could "go to the market" in this abundance of software goods. Besides, this deliverable was well inspired by the first ergonomic analysis of the PALETTE tools and services carried out by the writing team. So we will also explain our intentions as to the follow up to this first analysis in the prospect of the writing of D.PAR.07 (concerning the "second analysis of usability").

1.2.3 How to read this document?

In the first part, each view of each tool and service is conceived as a part that can be read separately. For instance, a reader will have the opportunity to take an interest in the educationalist's view of SweetWiki if he wishes to have some good ideas for using a service and read the description of the four points of view to get a sufficiently complete survey. Another way to peruse this document is focussing on a particular view for the set of tools. For instance, you can go through accounts given by users to get some idea of their popularity. In the second part, you can also have a reading about the existence of some features, but you can also take an interest in what is said about one of the services mentioned. So this document can be considered as a reference work to refer to.

We wish you a good reading of it.

1.2.4 About versions

The development of the PALETTE tools and services is evolving day after day. We could not write about them without focussing on a particular version. Screenshots, comments, pieces of advice in this report refer to versions available at the end of 2007.

Here are some examples. CoPe_it! version examined was the 2.03. The current version is 2.1. Developers carried on running speed of the service with some relevant results. So, some comments you will find about it should be deprecated. Amaya version was first, the 9.54, then the 9.99. The current 10 version is still much better and takes into account, a lot of suggestions made by the users. The eLogbook interface is evolving constantly. Some changes also occur in the development of the other tools and services.

As a consequence, we strongly advise the reader to take cognizance of the last versions of these tools and services. Here are the Web sites where to upload or access them.

Amaya	http://www.w3.org/Amaya/User/BinDist.html
SweetWiki	http://argentera.inria.fr/swikipalette/
LimSee3	http://limsee3.gforge.inria.fr/public-site/software.html
CoPe_it!	http://copeit.cti.gr/
eLogbook	http://elogbook.epfl.ch/
BayFac	http://sim.tudor.lu/palette/FormaHetice

2 Description of the tools and services for and by users

2.1 Amaya

2.1.1 What the developer tells us about it...

A double agent

In this introduction to the Amaya software, let us make it clear that this one is a browser (a program enabling to browse the Web) as well as an editor (a program enabling to modify directly the contents and the layout of a Web page). Apart from the first versions of Netscape, which are now part of ICT history, Web browsers and editors have generally been distinct tools. What is the reason for a program creating Web pages and another one to display them? A part of the answer lies in the fact that the page displayed is not the edited document but an interpretation of it by the browsing program. The difference is as big as the one between a music score and the music played and thus produced by an artist on the basis of the score. The music score played by the browser is a text document using tags in a so-called HTML language (HyperText Markup Language) and produced by an edition program. The tasks are thus rather different.

The double nature of Amaya (browser and editor) can therefore be seen as an advantage: the same tool enables to carry out two rather distinct tasks. However, this double function has a price: it is sometimes difficult to be dealt with as some concepts particular to browsers and editors are not always compatible. For instance, when using Amaya to browse, the user will be surprised to see that he has to double-click to follow a link. This is due to the fact that, in an editing situation, the result of a single click is positioning the pointer of the computer mouse at the place of the click. In collaboration with the developing team, we listed these troubling – even disturbing – behaviours in order to make the tool more accessible for users desiring to produce in a proper and simple way a text of a good quality, paying more attention to the content than to the form (cf. 2.1.3).

A clean editor

Amaya already has a long history, as it has been constantly developed since 1996 thanks to the researchers of INRIA in Grenoble. One of the main concerns of its developers is to follow very strictly the established standards for the Web, in this case those recommended by the World Wide Web Consortium (W3C), an international standard organization. This strict compliance with the standards might first seem to be a useless and artificial constraint, likely to be interesting for only a few computer scientists specialized in this field, and a very long way from a normal user's concerns. In fact, it is nothing of the sort: adhering to these principles enables the writers to produce texts while benefiting from a flexibility which is difficult to equal. An editor which adheres to these standards guarantees that any Web browser will be able to interpret without any ambiguity the language produced and display the documents the way the designer had imagined. The use of more lax HTML programs can bring many unpleasant surprises when reading a document on another system than the writer's. We will see that the HTML interpretation is not only limited to some well-known Web browsers (Microsoft Internet Explorer, Mozilla Firefox...) but extends over an increasing number of systems: cell phones, reading systems for the visually handicapped, electronic organizers (PDA), and so on.

Another advantage of Amaya is that it gives a smart solution as far as the durability of the data is concerned, by way of valid documents. It gives the writers the guarantee that it will be possible to read the documents in the future, whatever the evolution of the Web may be over the next years.

The users feel very concerned by this strict adhesion to the Web standards, even if they are not immediately aware of the fact that this adhesion will ensure the durability of their data.

Now that the usefulness of these standards has been established, it is interesting to note that Amaya does not merely adhere to the (X)HTML standard alone, even if the latter will hold the attention of

most users of the software. Some users with more specific needs will probably appreciate the aid provided by other standards and formats:

- MathML, enabling to write complicated mathematical formulas;
- CSS, enabling to create elaborated layouts, likely to be changed on the fly, without changing one single letter of the text produced (and all that, even if it is as long as a book – or more);
- SVG, enabling to create vector graphics, static or animated, which is most practical for diagrams and scientific illustrations;
- XML (more general and including more) – even if it has wider aims and bordering more the exchange of data through programming.

A really available tool

Amaya is free, and runs under different operating systems such as Mac OS X, Linux and Windows. So it is possible to install Amaya on most computers and to use it for producing documents readable by the great majority of computer systems. The tool has been developed so that the users could cooperate in the writing of documents and so that this cooperation could happen on the Web. A Web page can be displayed, modified, and then saved on the Web, exactly the way it happens for editing a document saved on a hard disk with a word processor. Therefore, it is enough to have editing rights which can besides be conceded to a group of persons. In the 10 version, it offers a user-friendly interface close to those of classical text editors. Moreover, a few layout models are offered, which makes it possible to help the user to avoid dubious tastes.

Amaya developers also plan to build templates on basis of structured documents like those CoPs members regularly use. Some of them are already available.

2.1.2 What the learning specialist tells us about it...

An example: the training of future French teachers

Within the context of the training of teachers who intend to teach French or French as a foreign language, the students are expected to produce many documents to work and to master the skills of the French language. They make up pedagogical patterns and imagine methodological approaches for getting on to these subjects with secondary school pupils in the lower cycles (namely during vocational training periods). The documents in digital version are exchanged between students and teachers. In other words, at a given deadline, the students mail their work to their teacher and to their "training master", wherever they are. This is even more practical if the students do not live in the town of the school and when they have to find accommodation in local accommodation for weekdays.

Of course, the paper version is still of topical interest. In this connection, besides keeping a written proof of the task carried out, another reason still often put forward is compatibility problems between the brands and the versions of word processors. Indeed, when a student sends a document that is not easily readable for the teacher's word processor, the teacher has an original written version of the document at his/her disposal for his/her corrections. In view of this problem, teachers from that Higher School introduced Amaya to their students as well as to their colleagues. This tool was downloaded on all the computers of the computer room in that school. In case the teachers and the students had personal computers at their disposal (laptops or desktops), Amaya was also installed on the computers in question. Further to this discovery, some teachers now also write up their pedagogical contract, notes and even complete evaluation tables using this tool, whereas many students rather carry out preparations for their training periods and other homework for different courses. More, some of them decide to create and share templates to facilitate this job. Their common goal of exchange of documents happens without any problem because everybody has a browser enabling to display and to read, even to print the document.

This way of proceeding finds extensions outside the school confines as the students also send their preparations to their "training master". The latter pay a particular attention not only to the content, but also to the form of the documents produced by or to be handed out to the pupils. Indeed, the students,

or even their parents quickly react when the layout quality of the documents is bad. Writing a document in the HTML format enables to focus first on the content just defining the semantics of the elements (title, item list...). Once the semantics has been defined, the layout can be carried out with a simple click as it is already possible in Amaya to choose between three different models of layout, and other models will soon follow. So it is easier to pursue objectives such as readability and quality of content.

However, some questions remain. How do the students and the teachers make the most of the numerous documents they wrote with a word processor? It is probably unnecessary to carry out a general conversion of all the existing documents, but to choose those that can constitute interesting resources to share (*e.g.* pedagogical scenarios, summaries and critics of books and papers, etc) in a community of learners or CoP of teachers. Undoubtedly they should take an interest in the documents likely to be exchanged frequently, and they should assess the need to modify some of them. A "copy and paste" will make the recovery possible, and so the content will immediately be tagged before a new model of layout is chosen. Moreover, we are in the context of a new practice, as we have to edit HTML documents. The fact that the tool is still perfectible may curb enthusiasm for its adoption on the part of the people for whom the intensive use of ICT is not a reality yet. But the developers of Amaya are sensitive to these questions and it gets improved from day to day. This should accelerate the implementation and acceptance of this innovative practice.

Reflections

Creating, amending and sharing texts

As most CoPs' members do, we regularly produce texts of any type. We provide them to others, in a printed or electronic version, either to let them benefit from our work, or in a collaborative prospect, to give them the opportunity to improve them. For a better understanding of the advantage we take of Amaya, it may be interesting to analyse the way we proceed.

To create or modify a text, we most often use a word processor. The composition of the text requires two rather different tasks: inserting content and laying it out. In the common practice, we alternate both. When we focus on the form, we risk neglecting the content. When we concentrate on the content, we sometimes neglect the presentation. An efficient practice consists in separating both tasks. We can first deal with the content before deciding on a correct layout. However, we have to admit that the layout helps to structure a text. Therefore, the best solution consists in carrying out a layout reflecting the structure of the text progressively tagging text blocks as we go along the creation. This tagging is used for defining semantics of presentation: this is a "heading level 1", this is a paragraph, this is a list of bullets, and so on. To do so, we can use the style sheets suggested by the software. Later on, if we wish, we will modify the definition, which will enable us to change the text look significantly. When the text suits us, we print it and hand it out. In case we wish to share it with others, we mail it to them as an attached file.

So, this was a global and concise description of an activity familiar to us, or even that we frequently practise.

Moreover, as CoP members, if we need to create and share structured documents, the design and use of templates can facilitate our task and support a reification process. But we have first to share a common goal (why using templates and their added value) and to negotiate the templates structure. This common enterprise can support the production of CoP's resources and the elaboration of a common directory (Wenger, 2005).

Giving a semantics versus formatting

How does XHTML enable structuring work associated with the use of formatting styles? Concerning that point there is a little subtlety to understand as to the difference that can exist between a word processor and an XHTML editor. Whereas the word processor offers the users the possibility to select text blocks, and next to apply styles to them, XHTML basically focuses on the semantics of blocks. Of course, (by default), any browser associates a style with each element of the semantics, but it is somehow anecdotal. Let us illustrate that.

With a word processor, we can choose to apply the style "headline level 1" to a text block. Doing this, we work on the formatting of the block. Consequently, the reader will probably deduce a different meaning for the rest of the text. In XHTML, the author of a document directly defines the semantics of the text blocks, independently from the style sheet the browser will refer to when displaying the document. So, he will state that a text block is an element of the sort "heading level 1". This definition has in theory nothing to do with the choice of a particular formatting. Note that the defining process of the semantics is very close to the one concerning the application of a style in word processing, since, as we said, the browser has associated a style of formatting by default to each of the elements describing that semantics. At the moment of the edition of a Web page, this formatting by default is indeed generally completely defined again in a style sheet, a set of formatting rules provided to the browser and which he has to take into account for the display.

What does this all mean? First of all, the semantics of text blocks is independent from its style and that a XHTML editor is less ambiguous than a word-processor in this regard. Next, the settings for the formatting can be defined in different ways, in several different style sheets, and if necessary, by professionals of the layout. The creator of the document only has to make his/her choice. CoP's members should understand this distinction and then make a habit of giving a semantic to their production and take care of the definition of a style sheet and agree on it afterwards. The design of Amaya templates partly forces to reflect on the structure and important things to underline.

So in this way we find again a conception of the text that word processors with most available styles had made us lose: a text is a content the formatting (and layout) of which is bound to the definition of a semantics facilitating the reading of it. As an easy-to-use XHTML editor, Amaya version 10 offers us the possibility to enter this scheme.

Accessibility

Let us start from some reflections that are observations as well.

- Nowadays, most written documents exist in a digital version.
- The evolution of the Internet has naturally placed a large quantity of information on the Web.
- Slowly, we move from a culture of the printed document towards a culture of the document displayed on-screen (even if many of us still prefer printed documents to displayed documents).
- We use computers everywhere and, as a result, not necessarily our own computer.
- A significant percentage of computers are (or can easily be) connected to the Internet, for a negligible cost.
- Numerous portable devices (personal computers, mobile phones, PDAs, GPS navigation systems) are connected to the Internet free of charge or for a negligible cost, thanks to WiFi access points or similar technologies, making information more accessible from anywhere.

The simple fact that it is possible to create a document knowing that it will be displayed on any computer with no software problem is already a must. But beyond that, having the possibility to save our documents on the Web, *i.e.* remotely, and having the possibility to access them from any computer connected to the Internet, gives us some comfort eliminating a very large range of potential problems. The use of the Web as a storage space is an attractive feature. Amaya already gives this possibility to CoPs.

Portability

Even if we limit our reflection to a subset of the Amaya features (those which should make it an attractive tool for people who regularly produce texts of all types as we do), we can measure our potential interest in the tool, by means of a few questions. At the same time, it should help us to step back with regard to our common practices and, maybe and in some contexts, invite us to innovate. Let us put a few questions.

- Do we regularly compose and share digitized text information with our peers?
- If so, do we take the trouble to use standard formats or do we simply send documents created with software using specific file formats that other software cannot decode? Is that sometimes a problem for our correspondents?
- Do we sometimes have to work again, on another computer than ours, on a document we produced? Do we use therefore external storage devices (USB sticks, floppy disks) to transfer them? Is that a problem we already met?
- And if we have to modify them once again, do we remember that we have to copy the latest version on our hard disk from the intermediate external storage device?

These questions lead us to a reflection about the portability of our productions. Maybe the word processor we used to create the document has not been installed on our correspondents' computer or on another computer with which we want to work on the document again. Or again, maybe we have got a former version of the software. Consequently, exchanges are not favoured. There is an alternative. It is called HTML, XHTML more precisely. As it is described in the section of recommended uses, Amaya is first of all a XHTML editor producing a pure, precise language, without any possible misunderstanding. The interpretation of this language is made by Web browsers, one version of which has been installed on nearly all machines connected to the Internet or can be installed for free. You should also note that Web browsers have been installed on mobile phones and PDA's. So, by producing documents in a standard HTML format, Amaya perfectly meets the criterion of the portability of the documents. This is important in a context where distance learning is increasing and retrieval and share of resources are fundamental.

2.1.3 The interface as seen by a user

An in-depth analysis of the Amaya interface (version 9.55) enabled us to bring out recommendations for the attention of the developers. A lot of problems highlighted by the users were bound to a lack of compatibility between the Amaya interface and the interface of similar tools (*i.e.* destined to a similar task or mainly to word processing). The collaboration between users and developers led to improve it into a new interface (version 9.99 and then version 10).

The main quality of the interface in the new version lies in the removal of most of the compatibility problems. All the direct references to the XHTML code in the interface have disappeared. For instance, to tag a text block "heading 1", you had to click on the H1 button, designing the XHTML code element necessary for this tagging. In the new interface, the H1 button has now been replaced by a T1 button among the buttons referring to the tagging elements. Consequently it is easier for us to understand its meaning ("title 1"). Generating valid code in compliance with W3C standards directly happens through the tool, and not the user. As a result, a user who does not have any knowledge of the XHTML language will nevertheless produce an entirely and perfectly valid XHTML document. This new interface is combined with a lightened version towards a use of Amaya as an editor of documents in touch with the Web standards and enabling a great reading flexibility and accessibility of the documents produced. So, for a first analysis, we relied on the main goals users set themselves in a text editing activity, *i.e.* (1) editing content, (2) layout, (3) management of particular elements (tables, figures/pictures), (4) browsing, (5) documents management. We know that these goals are not the ones which inspired the Amaya developers at the beginning, but nevertheless we choose to turn towards these rather basic goals as the work of Amaya users within the PALETTE project will first turn towards the production of documents such as meeting reports, courses... with an satisfying formatting. Let us go through these aims one by one.

Editing content

Our first task on entering Amaya is to create a new document. First we have to make a choice between several document types. What do XHTML, SVG... mean for an inexperienced person (figure 1)? Amaya offers much more than what we intend to do for the moment. So it is the first document type we are interested in: the creation of a XHTML document. The difficulty lies not only therein. The information in the query window is rather excessive. What have we got to choose as charset... as

document profile... as title... (figure 2)? The rule is that choices made by default are good choices. It is the case with the "charset" and "document profile" fields. But it is true that in a simplified version, this information could disappear and only appear if the user explicitly asks for it.

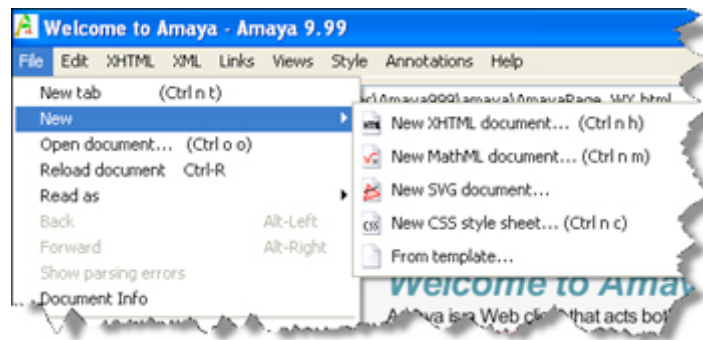


Figure 1

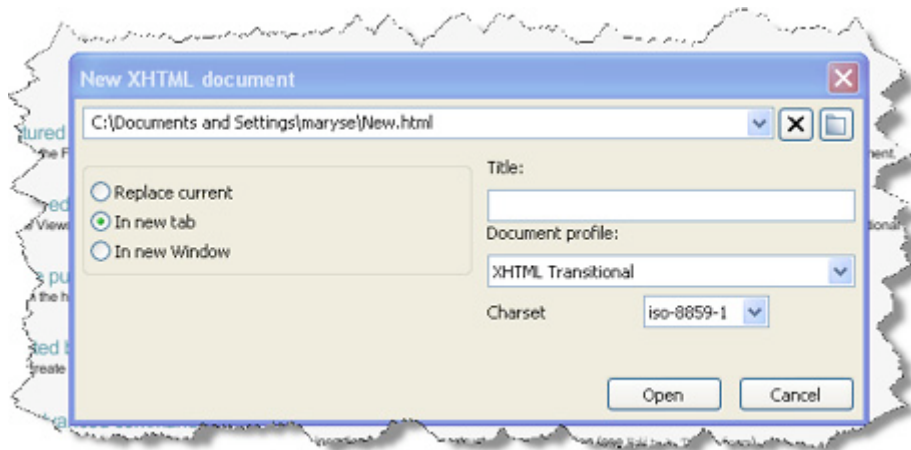


Figure 2

As regards to this title field, we have to imagine ourselves back in the context of the Web edition and to remember the interest we have to give a title to a page, and not necessarily identical to the one of the file (what currently happens by default), especially in a referencing prospect. Indeed, search engines as Google use the title to reference the pages in their databases. If you intend to be "visible" on the net, you have to pay attention to the title and introduce keywords describing best the page content. Automatically the so-called mandatory title will be integrated in the XHTML code at the *ad hoc* place. It is a good habit to pick up for the people who would venture further in the Web edition. In the new Amaya Editor Lite (version 10) interface, the edition of content is very intuitive. We do not encounter any real difficulty.

Formatting

The document formatting is done by associating style properties to elements. The interface has voluntarily kept this distinction in the menu on the right. The choice of attributing an element (for instance the one behind T1) to a text block is not a formatting operation. However, default formatting will be applied. We can just use the formatting by default corresponding to the "no theme" theme. Two other themes make it possible to choose different models of formatting for a series of more common elements. This choice is really easy to make with the menu on the right (figure 3). It does not require a selection beforehand. The corresponding styles are applied to the entire document.

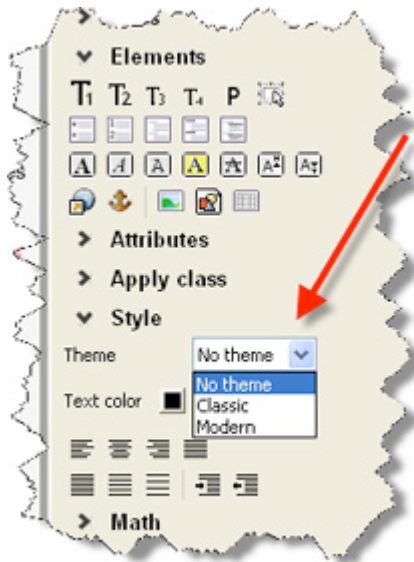


Figure 3

Moreover, this menu includes most of the buttons mentioned in a classical text editor (bold, italic, bullet...). So these tasks can easily be carried out. However, the users who would like to personalize their document even further will have to take the time to understand the principle of the cascading styles that can be used through the CSS language (Cascading Style Sheet). It is a necessary condition before entering the associated menus (figure 4) and being able to complete them pertinently.

Nevertheless, the developers should add other styles, which would enable a greater diversity of formatting and probably enable everybody to get something out of it. Among the points we found surprising on taking Amaya in hand, let us remember that to change the semantics of a block the whole block must be explicitly selected. There is no implicit selection as it may be the case in word processing. For instance, to give a block the

"heading level 1" semantics, it is not enough to put the insertion point within this block, the block itself has to be selected. Let us also note that the extension of a selection may be done by activating the ESC or F2 key (not very classical). The extension then happens, respecting the nesting of the blocks in the XHTML structure.

For instance, if the insertion point is inside a *strong* element which is inside a *p* element inside the *body* element, successive activations of the F2 (or ESC) key will successively select the highlighted text, the paragraph and finally the whole content. Other shortcuts are not classical, as some of them are directly associated with the XHTML language (for instance, to tag a text block as important: ctrl-i...refers to the *strong* element). In the printing perspective, a Web page sometimes corresponds to several printed pages. The management of the to-be-printed pages will undoubtedly disappoint us. Some future improvements should make this management possible and, why not, a visualization before printing. It is not possible to print a section in particular, for example, specifying "from this page to that page".

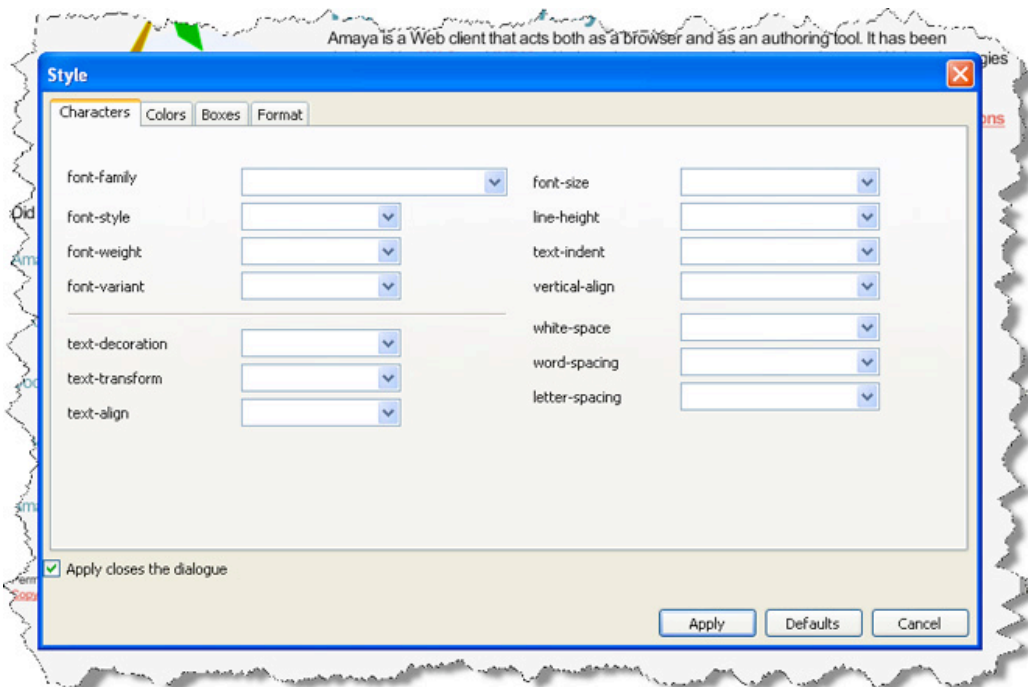


Figure 4

Management of elements in particular

We are all used to handling objects such as tables, pictures... in order to adapt their size or position "on the fly" with regard to the surrounding text. It is useless to try to change the width of columns of a table or the size of a picture in Amaya: these direct handling actions are not possible. Presently, for instance, the column width in tables is automatically adapted to the width of the text it contains. In order to modify the table settings, we have to use the Attribute tool and assign a few "width" or "height" attributes. Another solution is to modify the source code (the XHTML code - figure 5) through the Source view (available in the Views menu) and to manually introduce the adequate XHTML code, which is not obvious for everybody. Let us be patient. A future version of Amaya is expected to allow users to change size within table much more easily.

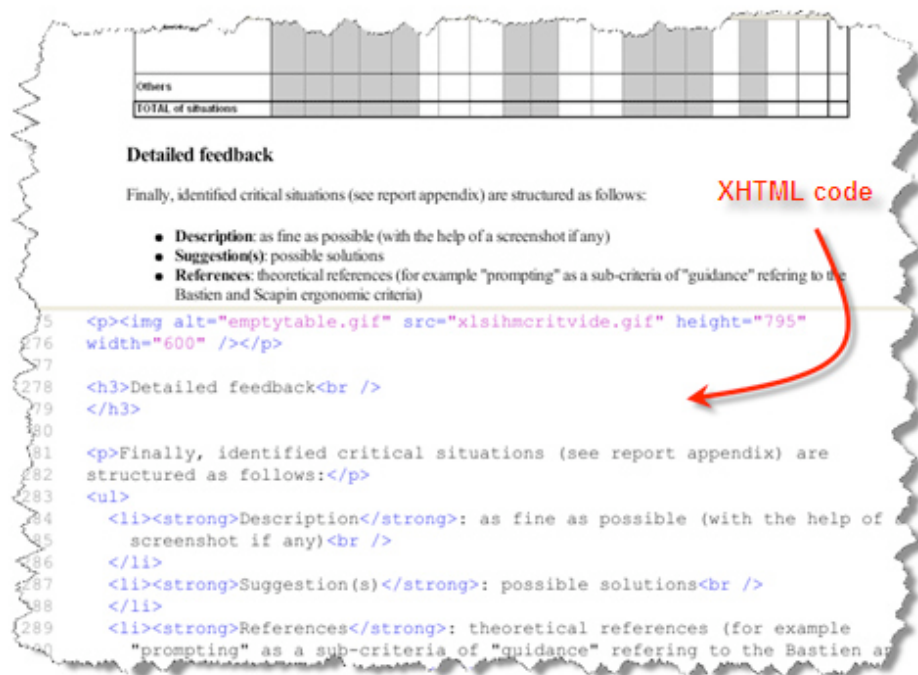


Figure 5

Browsing

The creation of links between documents happens easily from a button placed in the menu on the right. The same button may be used to update links easily.

Management of the documents

It is interesting to use Amaya locally on our computer because it enables us to create easily portable documents, facilitating this way a collaborative work. However, as users of word processors, we are not used to thinking in terms of multiple files. It is true that a Web page generally comes from information found in several files. In word processing, when we insert a picture in a document, for instance, it is automatically integrated. This is not the case with a Web page. The picture exists independently from the XHTML document. Consequently, in case the Web page is sent to a collaborator, we have to associate the set of useful/helpful files. In the current version, by using the "send by mail" function available in the "file" menu, Amaya automatically attaches the pictures or the other associated resources to the message. To view the document correctly, we have to save the set of the attached files in a folder before opening it.

Recommendations

Amaya has been developed so as to help the users to cooperate in the writing of a document favouring its portability. The persons having access to the Internet and the rights necessary for some documents can edit them online, *i.e.* download them from a Web site, modify them and save them back on the Web.

In the prospect of text editing, Amaya meets our needs if we disregard our desire (even our obsessions) to refine the layout of a document. We concentrate on the essential part, its content. By choosing to work with version 10 of Amaya, we do not face any insurmountable problems of usability in the simple formatting functions and we have the guarantee to produce documents in a correct format understandable by all browsers.

2.1.4 Experiences

It is thanks to the objective described by a learning specialist that several persons decided to use Amaya. They tell us about what they experienced, what they achieved, what went well or not so well. Are they still using Amaya? To do what? Which advantages or disadvantages do they find in it?

User 1: online edition

On the Web, we find billions of documents. The greatest majority of them can only be consulted. Of course, it is not possible to modify them. They do not belong to us. But, if we have an access to a Web server, we can create and place XHTML documents on it to let the whole world benefit from them. On the other hand, those documents do belong to us and we have the permission to modify them. The approach is not simple. To do so, we have to get back a copy of the document on the server and modify it with a XHTML editor. Next, we have to place the corrected document back on the server. Amaya was introduced to me as a tool enabling all these feasible operations in a simple way, because it is a XHTML editor and a browser as well. And that is what interested me first, that possibility to use the same tool to create or modify a document and then to consult it on the Web.

I first used a version of Amaya that was less ergonomic than the 10 version. Quickly enough, I had to admit that the tool was, above all, helpful to me as it enabled me to write documents in the XHTML format. However, the interface was a problem to me. The menus contained too many items whose wording was not always easy to understand, the icons were not the standard icons you find in other software of the same type, the dialogue with the user was often not clear enough. Today, I use the 10 version and I have to admit that all these difficulties have vanished.

User 2: report on meetings, directly/live or postponed/pre-recorded

As I regularly have to do some secretarial work for meetings, I decided to use Amaya instead of a word processor. Is it really feasible, in an easy and efficient way? It is most probably feasible and much easier since I have the simplified interface of the 10 version of Amaya at my disposal. Structuring my documents by having recourse to different heading levels, bullets lists, and so on, by enhancing some text parts... all this is possible as with a traditional word processor. However, some manipulations have astonishing effects and you should better know it! Thus do not try to give a heading level to the paragraph you have just typed or you are typing, this will only produce the opening of a new paragraph with the style asked just after the current positioning of the pointer. Ditto for a list... What can you do then? Select a paragraph that has to be formatted (the F2 key will help you to do this) and then carry out the command needed. Another problem comes from the automatic resizing of tables that often hampers a correct layout. Imagine your surprise if you arranged some pieces of information parallel to one another in columns and if the layout is modified out of the blue. The management of the pictures inserted in a document is not pleasant either, namely because these are not directly displayed. But what a pleasure to be able to mail files all the addressees will be able to open! Moreover, the use of a "template" for secretarial work in meetings should simplify my task (automatic insertion of the institution logo, heading summing up the date, the persons who were present or excused, the agenda, the date and place for the following meetings...). So I am going to examine this possibility.

User 3: ergonomic expertise with screenshots

I have used Amaya to establish reports listing the problems encountered when using online tools and services. As an illustration, I carried out screenshots that I inserted in the document. I had difficulties in displaying the pictures I had inserted in the XHTML document, managed by Amaya. So I cheated by using another browser for a regular and more correct display of the results of my work. It would be interesting if Amaya had a better management of the picture display. So far, I have got used to going through this intermediate stage of display.

2.2 SweetWiki

2.2.1 What the developer tells us about it...

SweetWiki is an online service that offers a wiki system. It is different from the other wikis in several ways. Here is what we think of the qualities its designers put forward.

A wiki

Above all, SweetWiki is a wiki, thus a collaborative editing system accessible on the Web. It is generally made up of a great number of pages. Each page contains one or several records the Internet user can contribute to. In most cases, anybody can edit a record. There are general wikis, which tend to encompass as much human knowledge as possible, as in the very popular Wikipedia case. This encyclopaedia is based on the contributions of its users and is often cited as a reference wiki, because it is probably the most important of all, both in terms of contents and number of collaborators. Unlike these general wikis, there are specialized wikis, intended for a very specialized public and in which subjects like TV series, cooking recipes, etc. are tackled. Two problems are recurring in many wiki systems, namely the oldest ones:

- they require from the user the knowledge of a specific *tagging language*, the syntax of which is often little user-friendly, in order to write a rich text. In a few words, "rich text" means that a semantic structure is added to the text: sometimes trivial improvements, as bolding or putting part of the text in italics, or adding a hyperlink, or sometimes more advanced improvements, such as organizing headers into a hierarchy;
- numerous pages are created, sometimes several pages a day, and it is difficult or even impossible to insert these pages in the web through links that attach them to other pages; finding a particular page again in the wiki is a crucial matter.

Let us see how SweetWiki tries to get round both obstacles.

A WYSIWYG editor

An editor is WYSIWYG (What You See Is What You Get) if the result that will finally be displayed on the screen is identical to the one displayed during its production. SweetWiki gets round the first previously tackled problem by using, as more and more wikis do nowadays, a WYSIWYG editor (in this case "Kupu"), which enables the easy editing of a rich text, and without any technical prerequisites. Its interface looks like the interface of a basic word processor. The semantic structuring of documents is very intuitive. By clicking on the "A" icon (figure 6), the editor modifies the selected text in an italicized text, while a menu offers structuring possibilities in headers. And these are only a few examples.

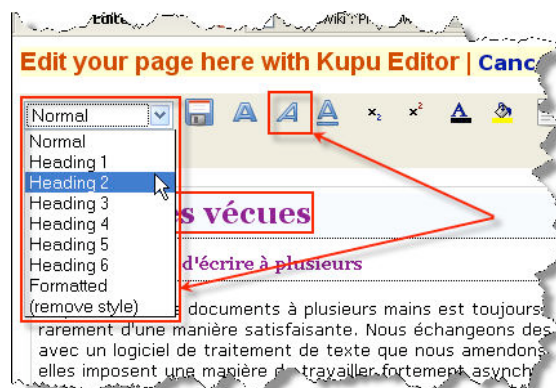


Figure 6

So the person editing a text will be able to create enumerations in the form of bullets lists or numbered lists (figure 7), to align parts of the text or modify other formatting settings.

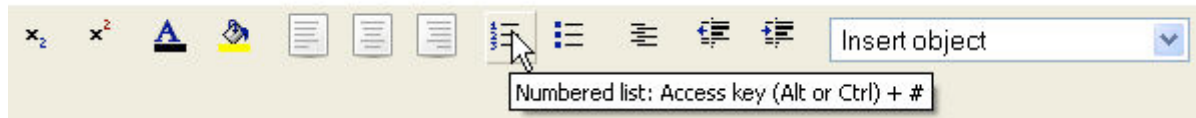


Figure 7

Moreover, the insertion of pictures is directly displayed.

The WikiWords and the marking system

SweetWiki offers two functionalities you do not systematically find in the other wikis:

- the first one consists in providing automatic creation of links, which is rather useful in a space destined to include a great many pages;
- the second one is a very interesting marking system (tagging) carried out by all the persons taking part in the wiki.

These functionalities largely contribute to the strengthening/increase of page search and of browsing within these pages.

Automatic creation of links

The automatic creation of links is based on the notion of WikiWord. A WikiWord is a character string beginning with a capital letter and including another one, such as SweetWiki, WikiWord, CoP... The term CamelCase is also used in the programming world, a universe in which the spaces are not well accepted. That is why the role of capital letters is important. When a new word is written that way in a record, it is located by the system and it becomes a hyperlink followed by a question mark if the system does not know it yet. If this link is activated, a new wiki page is created having this word as its name. You just have to write a word in the WikiWord format to make it a link towards another page (figure 8). This system is practical, but at the same time, it can prove to be heavy to use. Moreover, you have to admit that some automatic processes may be irritating for the users.



Figure 8

If the word already exists in the system, the link towards the page is automatically created, which considerably facilitates the writer's task. Besides, if the latter does not want this word to be a link, he/she can indicate it to the system (figure 9).



Figure 9

Tagging system for search and browsing

Tagging happens with technologies of the Semantic Web, those enabling to find quickly a document on the Web, or, if it is not possible, to facilitate the browsing towards it. With SweetWiki, we can tag a page (figure 10), but also a picture (figure 11), by providing tags that will be associated to it, *i.e.* one or several words estimated as relevant to describe the content of the tagged object.

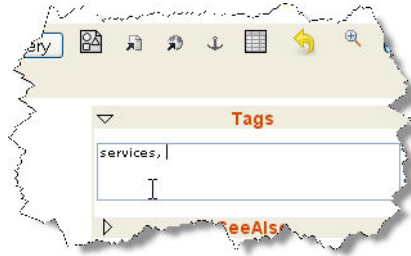


Figure 10

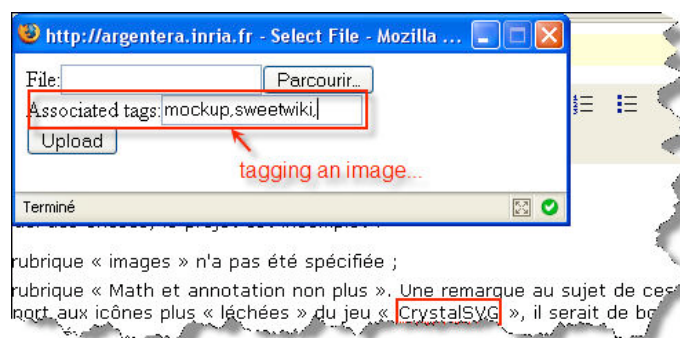


Figure 11

The service implements the approach of the so-called "social tagging". That means that any user has the possibility to find annotations that have already been used by others in one or several pages, but also to tag a page, an image... For instance, he/she can tag a page with one or several keywords he/she finds relevant. So everybody can benefit from the information that the others have defined.

As far as information search is concerned, the interest of tags is obvious. You can look for and find pages on the basis of one or several tags (figure 12).

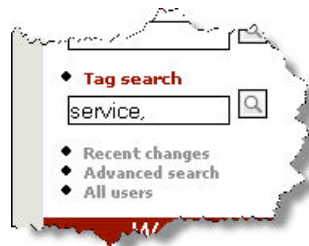


Figure 12

Thanks to SweetWiki, we can organize these tags into a hierarchy (figure 13).

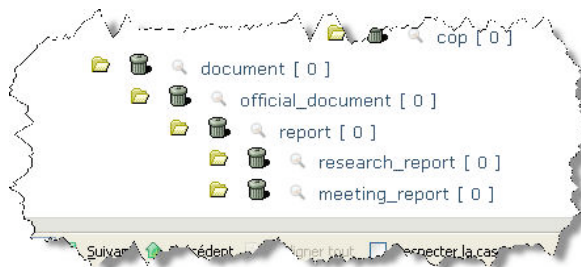


Figure 13

Such an organization may help when the tag used for the search is either too specific or too general. In that case, the system is able to suggest ancestors, siblings or descendants of the tag, what is very helpful.

The SweetWiki search by tag gives the list of the ancestors in the hierarchy ("subclass of...") as well as the siblings and all their descendants ("in the same category..."). It also provides the list of the pages, pictures, videos, files marked with this tag (figure 14).

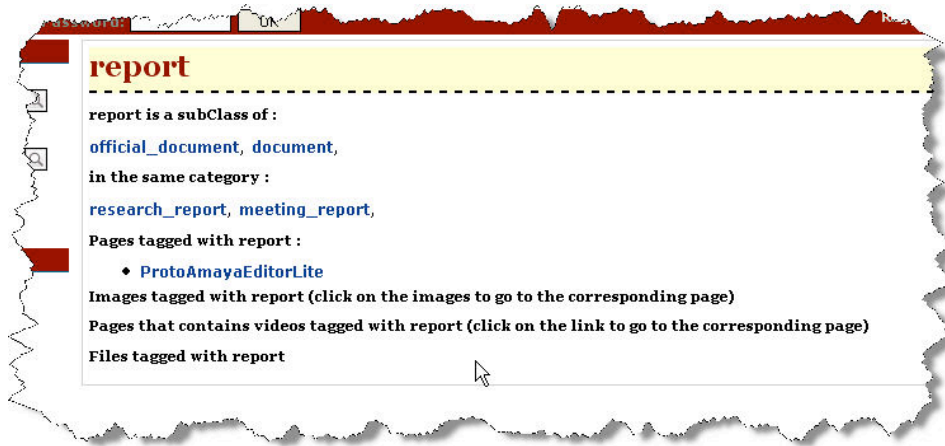


Figure 14

When a page is displayed, all the tags associated are listed. So, it is possible to navigate from a page of the wiki to another using the tags. A click on "ergonomic" (figure 15) will display a page with the list of all the pages of the wiki tagged with this tag (figure 16).

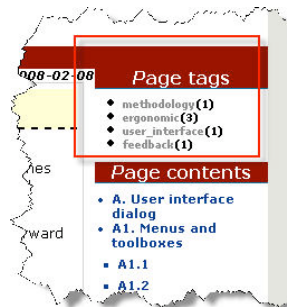


Figure 15

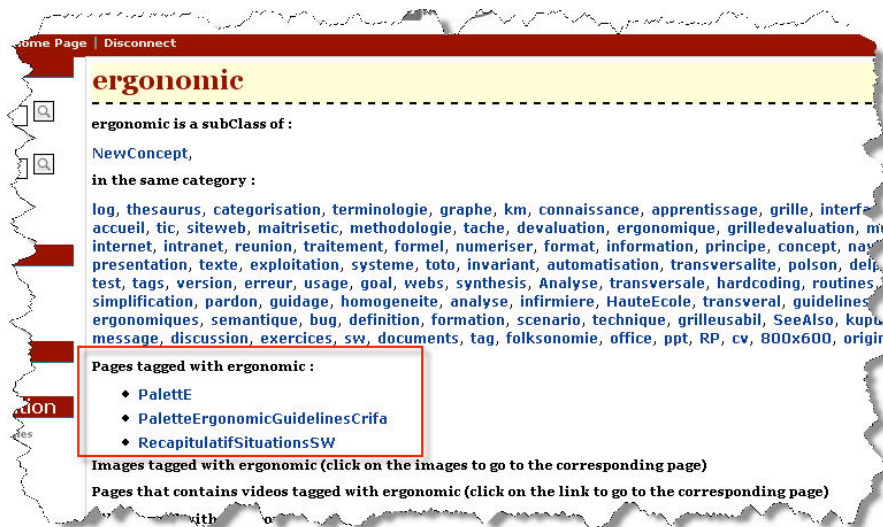


Figure 16

A second click on the name of that page (figure 16) will display that one.

A well-thought organization into hierarchy of some tags leads to a practical browsing system. Here is an example to illustrate very partially the principle mentioned above and its interest. In a service producing a lot of documents on the wiki, we can consider that *report* is a subclass of *official document*, the latter being a subclass of *document*. And the other way round: *research_report*, *meeting_report* are subclasses of *report*. When this page will be displayed, the tags *official_document*, *research_report* and *meeting_report* will also be displayed in the form of links, enabling in this way a reader of this page to find related pages again quickly, if the latter have been tagged with these words. Note that when it is an (idiomatic) expression, it is written all in one piece, in small caps without accents, what results from both constraints and good practice rules bound to the use of SweetWiki.



Figure 17

Advantage of the tagging for CoPs

We know the importance of ontologies for the CoPs, and how interesting it is to offer them tools and services they can make most of. An interesting way to build an ontology is to let the members of the CoP define their own keywords, creating in this way, as time passes by, a folksonomy of which we could say that it represents an important part of the vocabulary used in the community. The folksonomy can, if needed, be used as a starting point for the creation of a formal ontology. At least, by entrusting one CoP member with the task of organizing this folksonomy into a hierarchy with SweetWiki, we will couple the page searching system with a browsing system that will be even more efficient since the hierarchy is relevant.

2.2.2 What the learning specialist tells us about it...

An example: the merging between enterprises, a favourable context to learn through collaborative editing

The European enterprise EURAAA operates on the Aluminium, Automobile and Aeronautics market. This enterprise results from the merger of two firms: ALUFABRIK producing aluminium and AEROAUTOPARTS, producing parts for car industry. A managing director was appointed and the two former heads of the companies, now assistant managers, have to collaborate so as to reduce the production costs of the new enterprise. Both sites are geographically far from each other. Various observations have to be made:

- The making is seen as dangerous by the national and European authorities considering the risks of explosion, fire, chemical or gas pollutions. To cope with these risks, and because of the merger, EURAAA now has two internal fire departments, one for each site.
- A great number of tacit and explicit rules exist, in terms of safety, about what everybody must and must not do.
- There is a great knowledge of the activity boundaries in the merged enterprises and their departments, on the strategies to use for developing them and the way to cope with recurring problems.
- Given the number of employees and the strenuousness of their work, EURAAA is a firm where the turnover is high. This means that anytime, there are many newly hired persons.
- The merging of both enterprises has increased the amount of different valuation fields, but also the probability that some of these fields overlap one another.

Within the EURAAA enterprise, there are quality circles already grouping a good number of workers (foremen, engineers, workmen, firemen...) belonging to different departments of both firms. However, given the different functions they hold, all their members are not concerned by the same fields and do not encounter the same types of problems. All the questions cannot be tackled in large group either. That is the reason why it has been decided to entrust a group of motivated persons with the dealing of some questions. The members of this group have gathered twice, the members being present, and the group has progressively grown into a community of practice, the EuraFusion CoP. The objective of this CoP is rather wide: to understand the way problems are dealt with on both sites, to find an optimal way to resolve them, to share the practices and the existing resources. Its members will, among other things, have to understand the functioning of both enterprises, the respective tasks and responsibilities of the actors concerned, the difficulties encountered in each department, and to find solutions together.

Having things clarified, structuring, making knowledge accessible and sharing it

In this context, given the difficulty in bringing together the members of this community (geographical distance, time constraints), they have opted during their last meeting for the use of SweetWiki since it had been introduced to them as a service to support problem solving through common building solutions. The EuraFusion community has decided to write an online "book" that will list the safety rules that have to be respected within EURAAA. Even if this problem concerns all the sectors of the enterprise, some members seem to be more interested in safety than others, like the workmen compared with the engineers. Yet this general objective is shared as it concerns anyone who has to go on a production site. There only remains to determine common aspects to deal with regarding safety and aspects that are more specific to some functions, or some production lines. Each participant gives his/her opinion, as he finds a concrete interest in it. To create the book, the community has taken the initiative for allocating parts. According to their motivation, some are determined to have their experience recognized, others their status in the enterprise, another group their skills. As an example, some workmen, foremen and firemen know and follow safety rules every day, but they do not feel at ease in writing. Some engineers, also interested in safety matters, have volunteered to supervise the writing of the document. Their group has decided to appoint the most motivated person among them "organizer of ideas" and "writer". As for the workmen, foremen and firemen, they are the main contributors. They are the ones who provide the information on the procedures they follow, the existing documents they have recourse to. They enrich and check the accuracy of the contents offered in the document as it is being written. When the writing is considered as complete, it is submitted to the other engineers, workmen and firemen for an extended validation. According to his/her skills, each worker plays a specific part in the community. In this way, the implication of the foremen as coordinators and regulators looking after the collaboration between the engineers and the workmen is essential. First, the pages are created without any preconceived logic. They are accessible to all and list the safety rules people have to follow in given situations. The organizer of ideas then takes the initiative for offering a structure for each page with identical points to tackle for each safety matter (description of the task, problem(s), ways to proceed and proposed solutions). Next, the pages are linked to one another. The resources are progressively structured and the pages are tagged, enabling in this way, for instance, the association of different problems of an identical nature. The complementary parts and the division of the book in semi-structured pages favour the work progress. According to this example, in each department, other small communities decide to write down guidelines concerning their work and the knowledge of the field they have expertise in. So this work helps the newcomers and the members having little or no experience in a given field, to inquire quickly about the enterprise activities and to find answers to their questions. By sharing the knowledge, everyone frees himself of the heavy task of answering repeatedly the same questions. Later on, and on the basis of the structured knowledge, another "organizer of ideas" gets down to elaborating a "frequently asked questions" header available on the enterprise intranet. From now on, the system enables experts to leave a written sign of their expertise. If this sign does not really replace experts, it helps newcomers not to reinvent the wheel by giving them instructions and ideas on a given subject.

Capitalizing knowledge, making resources durable and keeping traces of work

Before the merger, each enterprise produced a great number of documents: first with typewriters, later on with different word processors. So you find much paper and a few computer files in various

formats and on various supports. However, part of the information contained in some of these archives remains most useful for the EuraFusion community members and for everyone in the enterprise. But most of the time, people looking for it give up, as they do not have any idea of the place where it can be – if it was not destroyed in the past. SweetWiki helps them to stop this loss of knowledge by making the available information durable. Of course, this process implies having a recourse to "copy and paste" techniques, using optical character recognition after the scanning of paper documents, or even a typed transcription. But these techniques are only used for the documents that are really worthwhile and particularly those frequently asked for. Once this work has been done, the information is available in the information database and if the document has intelligently been marked with tags, it is from now on easily accessible.

Collaborative editing and spreading

To enrich the capitalizing process and the sharing of knowledge/data, it has been decided that every new resource associated with the CoP is produced in SweetWiki. In the EURAAA enterprise, many resources have to be created in common (from the writing of administrative documents to the writing of technical specifications). Another community made up of about ten persons produces common and multidisciplinary documents: a code of ethics within the enterprise, internal regulations for a department... The community members work on the document, with a deadline to meet. Working in a more traditional way – writing documents with a word processor, mailing them so that they are read over by the other members, waiting for answers, and so on – is now perceived as counterproductive compared with what can be done with SweetWiki: modifying, reading over by the peers, and instant awareness of what the other members are producing.

Searching for, exploitation of /processing and exporting knowledge and resources

Once the writing task has been carried out, the EuraFusion members upload their documents, print them, photocopy them and hand them out to the members of the firm who are concerned. But, they can also access these documents by themselves. As the CoP has tagged the different resources created, everybody can obtain precise information, such as for instance information about a safety problem specific to a given position. While consulting it, François associates with an "instructions for use" page, some keywords such as "worksheet", "problems", "machine", "bolt", ... Later, his colleague Antoine would like to find the document again of which he knows that it deals with a problem encountered when using this aluminium producing machine. The use of one of François's keywords will enable him to find it again without any difficulty. Besides, SweetWiki also offers Antoine the Web pages linked to the other keywords François has associated with this page, what gives him access to other interesting pieces of information he might never have found and enables him to learn something!

Reflections

The different tasks illustrated in the mini-scenario described above are relevant practices in using SweetWiki. The service proves to be interesting for clarifying, structuring, sharing and making information accessible. It helps capitalize information, make pre-existing resources durable, and it enables to keep written signs of a work that is being worked out. This information is accessible to a theoretically unlimited number of people, starting from anywhere on the Web. The information can be uploaded and is machine-readable under other formats (computerized or paper versions).

Cooperation, collaboration and reaction speed

The production of documents by different persons is always a challenge. Each of us tries to take up himself, rarely satisfactorily. More often than not, we exchange bits and pieces by mail or we send some word processor files that we try to modify in turns. These procedures are often heavy and long as they set a strongly asynchronous working method: everyone has to wait till the preceding writer hands over to him/her with, in the end, a non negligible waste of time.

Shared interests and stakes

The service is favourable to mutual efforts and enables the evaluation of individual ideas. One of the conditions for such an undertaking to succeed is to group people with shared interests and stakes (Callon, 1986; Akrich, Callon & Latour, 1988). Their association around a common project involving

a written production happens through the elucidation of the pursued aims. Depending on whether the collaboration is spontaneous or forced on (eg. by the hierarchy/head), the actors' mobilization is more or less easy. Whatever the situation may be, more often than not, it is on this core/small group of persons that the project and the production are based, even if their results potentially interest a greater number of actors. (Cornu, 2004)

Comparison of ideas and quality of production

Collaborative editing enables people to compare and combine ideas. Sometimes, one person's idea sparks off a new idea for another person, or enriches it. This comparison of points of view generally leads to a better structuring or development of the ideas. Everybody has the opportunity to express himself, either punctually or intensively. People do not always seize the opportunity to produce something, that is the reason why or that is because of the fact that some people tend to monopolize the pen. Quite often, this collaborative editing process also enables people producing these resources to learn something, namely to assimilate somebody else's point of view (Doise, 1981; Doise & Mugny, 1985; Perret-Clermont, 1979) or to clarify his/her own thinking.

Creativity and structuring

The wiki is rather a tool for producing and improving productions and writings in an incremental way. Each contributing person spontaneously expresses his/her ideas, whatever his/her writing style may be (e.g. structured or not), and creates pages according to his/her own interests. This service is relatively little restrictive in terms of structure. Numerous pages are created and thus it is not easy, and so certainly not a good idea, to try to structure them whether it is at the beginning or when a certain number pages have been produced. On the other hand, it is interesting to be able to find the information again and the tagging system offered by SweetWiki is obviously the remedy for an absence of structure. Moreover, as it enables to manage the whole set of annotations and, for example, to organize them into a hierarchy, we can have a structure not of the pages, but of the keywords enabling to find them again.

The users' roles

There are numerous parts for the users of a wiki. Some users really contribute to it, whether they are experts or untrained in the area. Others observe, sometimes react or again just take advantage of the finished product. SweetWiki gives us very little information about the contribution of the different contributors. Roughly speaking, we only know the name of the last contributor to each page. Besides you cannot determine what the latter has modified. If you want to use SweetWiki in order to compose a page collectively, it is actually necessary to define writing strategies, because of the little information given about the modifications and the persons who carried them out. For instance, you can adopt a writing mode where the latest contribution is placed in the first or last position. You can decide that everyone will tag his/her contributions with his/her initials. It is also possible to agree on the use of particular formats to give semantics to the interventions (comments in italics, important comments in bold...). All these agreements remain heavy to use. In case the document has to lead to a real editing (publishable document), it is advisable to give one single person the responsibility for writing (style and restructuring), asking the others to restrict their participation to commenting or making remarks. If the contributors know each other well, they can, despite that, work in a multi-editor mode.

Conflicts

In a collaborative document editing prospect (which is not necessarily, let us repeat it, the best possible exploitation of a wiki), some problems crop up. The reconciliation of the users' editorial styles and cognitive styles can lead to improvements of socio-cognitive conflicts... or simply of conflicts if these have not been solved. In this case, a coordinator, acting as an interaction moderator and as an organizer of ideas is much needed. As to motivation, it is aroused by the prospect of contributing to something useful to a community, by the others' gratitude for one's own contributions, by a certain pleasure of seeing the task progressing and by the pleasure of learning more about a given topic or the collaborating process itself.

Modifications of practices and cultural change

The use of a wiki, and beyond, of a tagging system as offered by SweetWiki, implies modifications in usual practices. Production, search and information share reflexes have to change a bit. The appropriation of new practices goes hand in hand with the building of new representations of the work done. This often takes time, and you have to take it into account for the implementation of a new service. So, the use of word processors giving most highly specialized functionalities in terms of formatting has (too) often accustomed us to spending time on formatting, sometimes to the detriment of the content. In this context of collaborative editing and production of relevant information, we can afford to lose this reflex and carry out the editor's commands for a structuring purpose. Since it is also the mission of the HTML language (cf. the section about the Amaya software), the elements of this language are used to give text blocks a semantics (header level 1, paragraph, list item...) and not to define sophisticated layouts. Moreover, SweetWiki does not give us the possibility to modify the styles associated with these elements.

The use of SweetWiki also raises the issue of intellectual ownership and of the psycho-emotional attachment the individual can feel in relation to his/her own productions. Sharing your knowledge and your resources also means sharing your power, your forces and your weaknesses. It means running the risk of somebody else's criticism. First, the wiki user feels some difficulties: he/she does not always feel free to modify other members' pages within his/her group, or to accept the modification of his/her own production by a peer. This process requires a reciprocity (Eneau, 2005), trusting somebody else and respecting him/her. Most contributors can dread being read by others, fear other people's opinion, and all the more since their production is not mature or if their ideas have not been put in precise words yet. At the beginning, this functioning may cause some trouble, because it is a matter of a real cultural change everybody has to cope with. Therefore an adapting time is necessary to users to let their representations evolve as well as their conceptions concerning the collective production and diffusion of information, to notice that they gain respect according to the contributions they have carried out.

Investment

Collaborative writing can give the impression that it takes more time than individual writing. You have to understand somebody else's point of view, to negotiate, to modify some representations or opinions, to take numerous revisions into account, to go into detail, to get over some frustrations, etc. This complex approach is easy to learn and initially requires an investment in terms of time from the people who are not familiar with it. However, in the end it brings quality results since it integrates and takes different opinions and arguments into account, which also makes them more acceptable and usable in the practice. A little piece of advice for the people for whom such a practice is new: start from realistic projects, not too ambitious, rather simple to negotiate, in which everyone finds an interest. The documents that have to be produced, at least in the beginning, should not be too long.

Organization and sharing of the data/information starting from the management of ontologies

SweetWiki enables to capitalize and structure knowledge. The editor of a page has to explain his/her knowledge of a given topic so as to make it understandable by somebody else. This transition from a tacit knowledge to an explicit knowledge (Nonaka & Takeuchi, 1995) can be coupled with a structuring process thanks to keywords (tags) that can be used as a basis for search, on the one hand, and the building of ontologies on the other hand. Therefore it is important to accustom users to tagging the pages they create or they access. The choice of terms and procedures to describe the tackled concepts remains a matter to debate. Is it necessary to decree some rules, and if so, from when? Or is it better to wait for rules to emerge from the community (e.g. use of the singular or the plural, word nature...)? The most commonly admitted rule is that it is important for the keywords to be meaningful to the users. So it is important to think about the way to choose them, and namely, their relevancy in a search context. It is probably advisable to avoid using too neutral words or words having a lot of different meanings. As soon as the number of keywords increases, it becomes interesting to organize them. Of course, the system encourages users to use them by offering keywords semi-automatically while typing, but their organization into a hierarchy as SweetWiki suggests proves rewarding. There remains to know who is responsible for it in the CoP. Probably a person who is most involved in its

functioning and who knows well the type of language used by its members, because the organization into a hierarchy can be used as a base for creating an ontology which, once it has been validated by the community members, can be used as a basis for the modelling of the knowledge stored on the wiki pages.

2.2.3 The interface as seen by a user

The editor interface

Editing and XHTML code

In terms of usability, SweetWiki offers the advantage of including a WYSIWYG text editor named Kupu (see section 2.2.1 for further information). The content we insert in a page is directly translated into HTML code (unfortunately not in XHTML for Kupu, but it is still relatively readable by all Web browsers). The editing interface looks like a simplified word processing interface. The formatting of a document is open and quite intuitive for the user.

There is however a problem: at this stage of development, the association of the Kupu editor and SweetWiki creates a code which is not respectful of the standards and generates unexpected errors like, for instance, showing a whole part of a document as a header level 1 even though we did not do anything therefore. Converting the code produced into valid XHTML code is a challenge. At this point, it is thus necessary to make a lot of changes in the code, which requires a minimum understanding of it. Moreover, finding the place where the correction has to be carried out is a tiresome task for long documents.

When errors are too significant, we advise going back to an earlier version of the page thanks to the link "Page versions" in the left menu.

However, the numbering of the successive versions is not inserted in an obvious way (figure 18)! You have to be patient and browse the different versions.



Version	Date	
SweetWikiErgonomeNew	current version	
SweetWikiErgonomeNew49	2007-10-0	restore
SweetWikiErgonomeNew48	2007-11-5	restore
SweetWikiErgonomeNew47	2007-10-0	restore
SweetWikiErgonomeNew46	2007-10-0	restore
SweetWikiErgonomeNew45	2007-10-0	restore
SweetWikiErgonomeNew44	2007-11-5	restore
SweetWikiErgonomeNew43	2007-11-1	restore
SweetWikiErgonomeNew42	2007-11-1	restore
SweetWikiErgonomeNew41	2007-10-0	restore
SweetWikiErgonomeNew40	2007-11-5	restore
SweetWikiErgonomeNew39	2007-11-2	restore
SweetWikiErgonomeNew38	2007-11-1	restore
SweetWikiErgonomeNew37	2007-11-1	restore
SweetWikiErgonomeNew36	2007-10-1	restore
SweetWikiErgonomeNew35	2007-10-0	restore
SweetWikiErgonomeNew34	2007-10-0	restore
SweetWikiErgonomeNew33	2007-11-5	restore

Figure 18

This menu is also particularly useful in case of deletion (by a malicious or clumsy user, for instance): the restoring will only cost the patience we already talked about.

"Useless" menus

Presently, there remain menus which are of no use for the user in the editor interface (cf. the bottom right-hand corner of the screen; *e.g.*: debug log). Those only regard the developers and should disappear from the interface in the medium term. Please do not take them into account!

Most common aims

Let us now put the editing task aside and focus again on SweetWiki. For more clarity, we have chosen to start from use goals (defined after using SweetWiki) and analyze the problems encountered.

The use of SweetWiki leads us to:

- registering (creating a login and a password),
- browsing the pages included in SweetWiki,
- creating and managing pages,
- saving information,

- printing the content of a page,
- following the changes of a page modified by several people,
- managing ontologies.

Let us go over those goals one by one.

Registering in SweetWiki

The "Register" link at the top of the page takes us to the registration page. As far as registration is concerned, the major difficulty encountered at this stage is the respect of the form of our login: it must be written like a WikiWord, a word containing two capital letters (of which the first character), without accents (example: ThereseDupont). The system helps us for this first step, by giving automatically a WikiWord based on our name and surname that we supply while entering. We have the opportunity to change it, but respecting the constraints imposed.

Note that when those references have been created, it is no longer possible to change them. A page is automatically created on the basis of our name and it is used as a personal page.

Surprisingly, it is possible to modify any user's personal page, because in the wiki spirit, anyone is given the right to modify and add information, which does not really fit with the idea we have of a personal page. In brief, this means that in a community using this service, we have to lay down the rule not to modify the others' personal page, at the risk of making them disappear from the list of users based on the list of the most recent collaborations.

Browsing the pages integrated in SweetWiki

Without knowing the exact address of a page, it is not always easy to get one's bearings in the SweetWiki labyrinth. There are numerous pages and the use of search tools may seem complicated. Several possibilities are offered to find a page again (figure 19):

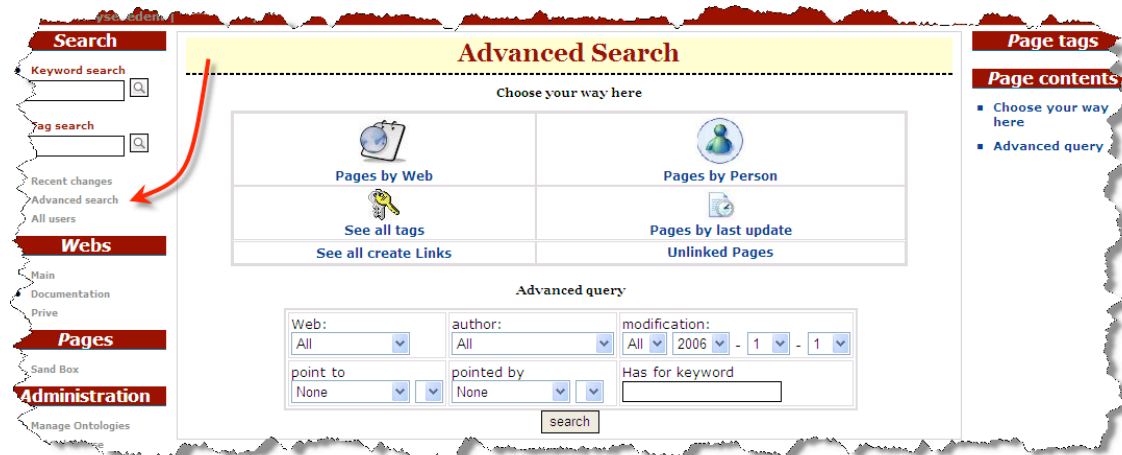


Figure 19

- Keyword search: the search for the encoded keyword(s) happens through all the texts integrated in the wiki. It is a type of search we are familiar with, but which we are not completely satisfied with: the search is not very accurate and the list of the pages found can become very long. Besides, the keyword has to be spelled correctly.
- Tag search: this type of search is the one SweetWiki prefers. Starting from a tag associated to the page content, its creator, people modifying it or wishing to consult it, find it easily. The system offers the encoded annotations starting with the characters strings entered by the user who just has to select the interesting one, if it already exists. Moreover, as the keywords can be organized a posteriori in the form of an ontology (see section 2.2.1), the other tags associated with this page, their parents and their siblings (in the sense of the hierarchy) are also offered in the search results.

- Recent changes: this link opens a new page displaying the modified pages or the pages created during the last week or the last month. This method is most efficient for searching the developing pages.
- Advanced search (figure 19): this link opens a new page offering a search according to different criteria. This page is at first sight relatively complex since the search possibilities are numerous and sometimes redundant. We advise users to make the most of all the other searching methods

Creating and managing pages

When we are logged in with our identifier and password, we can create new pages by filling in a text field appearing on the left menu (figure 20). You just have to type a WikiWord there. By activating the "go" button, you immediately get into the editing of the new page.

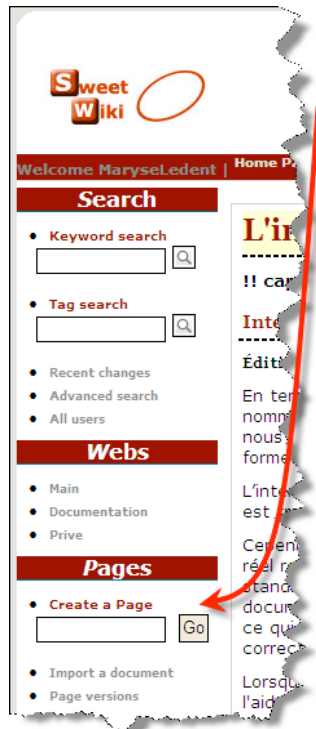


Figure 20

It is extremely easy to create new pages and of course, it is a great advantage of the service. We should also think a lot about the name given to that new page because, subsequently, it will neither be possible to rename or to delete it. For instance, if a typing error has been made in the name when creating the page, this will be saved in the system, for ever. Of course, it is possible to recreate a page with the name you really wished to give, and next, to "empty" the other page. But the empty page will still exist. You will just have to visit the former versions to read the text again. These constraints are rather due to the wiki spirit. You cannot delete a page as soon as somebody else has consulted it. Because of this, we should think twice before supplying the system with confidential data. The links between the pages are made in the Kupu editor. This stage does not present major difficulties with usability. However, it is not always easy to find the page to link in the long list of existing pages.

Saving a page content

Unfortunately, there is no system of automatic saving. So it is imperative to save the page content regularly while editing (every ten to fifteen minutes). The edition of a page corresponding to a work session is controlled by a server. This one decides to close a session if the period of time between two interactions exceeds a given time delay. This situation

is not without a major drawback. We are writing an article in a page. A colleague comes and finds us. We chat a while, and we want to resume the writing, the session has expired and our work vanished ☹.

Printing a page content

When printing a page, as we are used to with classical interfaces, our first reflex is to use the "file" menu in the browser and start the printing process. We advise users against this approach because the document layout is not optimal, the left and right margins being particularly wide. On the other hand, there is a "print view" icon at the top of the page that enables us to display it in a valid printing format. Starting from that other page, we can resume the usual printing process and use the "file" menu in the browser.

Following the modifications

In its present version, SweetWiki does not enable us to put forward the latest modifications. Each time we resume the editing of a page we are working on with several people our first task is to skim through it to check if there is anything new. To facilitate this approach, we have to find, together with our partners, a means of putting forward the latest modifications coupled with their authors. For instance, we can place our initials at the beginning of the paragraph(s) we are modifying. But it is not the more convenient way to work. We cannot rely on the "page versions" link (accessible via the left menu) as a help in this task: this link only enables to come back to a previous version of the page and to erase the latest one (contrary to other wikis offering comparisons between versions).

Managing ontologies

We have seen that SweetWiki enabled any collaborator desiring to search for pages to do so thanks to tags directly associated with the pages. In the present version, we think that the management of these tags in the form of ontologies is tedious : the set of the tags defined are found in a long list you have to sort out and organize into a hierarchy. If dozens of tags have to be organized, the workload quickly becomes excessive. So it is strongly advisable to organize tags most regularly as you define them.

Recommendations

Globally, SweetWiki is usable and really acceptable as wiki service, with a damper: an editor sometimes having surprises in store at the final display. It is an important problem that might discourage several users and make them abandon the idea of using this service. However, the developers are aware of the necessity to help users to get more intuitively into the Kupu editor. Despite this difficulty, we strongly advise them to get to know SweetWiki, the interface (presentation in English) of which should not present real difficulties to the users, as long as their approach remains intuitive. At the present stage of development, you have to be particularly careful and carry out regular savings otherwise you might loose your work! The SweetWiki developers presently try to solve this problem. When it is associated with a more predictable editor, we will be able to declare that SweetWiki will be very helpful in the production of data.

2.2.4 Experiences

User 1: an experience of collaborative editing

For almost one year, our team made up of ten researchers in the field of educational sciences has decided to adopt SweetWiki for all its needs in collaborative editing. All the researchers have "played the game" and hundreds of pages have been produced. This result, in itself, validates the usability of the service. It is too early to answer the simple question: "does it bring a gain in comparison with other collaborative editing systems?". This intensive use has enabled us to state that indeed the idea defended by SweetWiki is attractive and can function, or even give excellent results. But its experimental nature obliges us to be careful. A good knowledge of some defects in the service will avoid the waste of time they might cause and the discouragement the latter might provoke. The real use of SweetWiki gets nearer the use recommended. It is useless to go over all that again. Ten months of intensive use taught us things and we would like to let people share them. First of all the productivity it creates and the opportunity it gives to keep several written signs of the activities, next the appreciation of the limitations. Finally, it is useful to notice the new uses and the new methods it brings for work.

Producing and keeping written records

If we absolutely have to admit something about this service, it is that it enables anybody to formalize the result of his/her reflections and to put them at the disposal of the persons concerned. In this way, you shorten the time to react, and so, you increase the interaction rate between people. Rather naturally, this leads to a transition from a verbal language to a written language, which mostly accounts for the large amount of documents. On the other hand, you keep a written record, or even better, you increase in an incremental way the quality of the production, either by completing it, or by correcting it. All this does not happen without a few difficulties that are explained in the section about the changes in practices. We also have to learn to manage this surprising result in terms of number of produced pages. Indeed, all the pages will not necessarily evolve towards a final production, but they will be written signs of an activity that has been going on and the information they contain will remain potentially recoverable. The proliferation of these pages is not a problem since the service offers a more modern management system than grouping, classifying, structuring. We also mention it in the section about the new practices that have to be developed.

Using with caution

- There is no automatic saving system, so it is imperative to save the content of the page being produced at regular intervals (every ten to fifteen minutes).

- It is impossible to compare two versions (successive or not) of a same page. When a text of several thousands of characters has been produced by a first writer and then been read over and amended by a second one, the first writer should theoretically be able to check that the expression of his/her idea has not been overworked by a radical change of meaning, which can happen easily by moving a comma or by changing a preposition. Without any system following up modifications, this is extremely tedious, as it means that the first writer has to read over the text that has just been modified, trying to remember his/her initial text. This is even more difficult when the length of a text and the time which has elapsed since the creation increases. The system does not use a classical time stamp when it was carried out but uses a disconcerting notation.
- The attribution of text segments to a writer is not automatic. It is impossible to know who wrote what part of the text. Now, it is often necessary to know who has written what, namely in case you want to discuss the relevancy of modifications.
- It is impossible to rename a page.
- It is impossible to erase a page or to remove a user.
- It is impossible to modify another user's personal page.
- The HTML code generated by the service is not valid. Trying to carry out too sophisticated layouts has to be avoided by all means. You risk seeing the whole layout changed. In that case, the help of a person mastering the HTML language is necessary to solve the problem. For instance, on several occasions, one of our researchers was faced with a text of thousands of characters, the whole lot being defined as header level 1. To find back his original layout, he had to leave it to a colleague. The latter had some difficulties to repair the page, as it was not easy to work with non valid code. Similarly, isolating a page from the wiki to work on it again with HTML editing software (for instance the Amaya software) is not possible without revising the code in depth. For instance, we often have to collaborate on an article with SweetWiki. Once the document has been completed, we have to "extract" it to transform it into a XHTML document. This procedure, which could be completely automated, requires a long stage of manual "cleaning".
- The managing system of the ontologies is heavy.

Changing one's habits

Our experience makes us want to make some suggestions to the other users. Let us first note that it will be difficult for us to start in a new dynamics without a slight change of our habits. These changes are not very restrictive and, if we pay attention to them for a short while, they will soon become a habit. Here are our suggestions:

- Let us carry out sober layouts. The use of word processors offering highly-specialized functionalities as far as formatting is concerned, has (too) often accustomed us to spending time on dealing with the form rather than with the content. In this context of collaborative editing and production of relevant information, we can afford to get rid of this reflex and to content ourselves with using the editor commands for structuring aims. As it is beyond the mission of the HTML language, the elements of this language are used to give text blocks semantics (header level 1, paragraph, item of the list...) and not to define layouts. Moreover, SweetWiki does not give us the possibility to modify the styles associated with these elements.
- Let us define community habits. SweetWiki gives us very little information about the contribution of the different collaborators. Roughly, we only know the name of the latest contributor. This obliges us to define writing strategies when we write in collaboration.
- Let us tag the pages. We should tag our own pages, but also the pages we have not written when the existing annotations (tags) do not suit us. A good page tagging system prevents from having to organize them (and namely to link them), the main thing being to find them quickly again.

User 2: cooperative editing of news

Within a course of educational technology where students are asked to define scenarios in which a computer is used in an educational purpose, I (editor's note: a teacher) have decided to use SweetWiki as a support in the traditional session of "news" communication at the beginning of the lesson when learners give information about different tools or organizations dealing with this matter. So each learner enrolled in the wiki chosen for that purpose and could edit information on the basis of a given framework (title of the news, summary, source and author). Thus this model enabled them to use different styles (header levels, text body, hyperlink, etc.) and in this way to get familiar with the Kupu editor. By and large, the users edit new information quite easily. However, at the beginning, some of them did not find immediately what had to be done in order to create a hyperlink. Others had a few difficulties with the layout, for instance to bring a bolded or italicized paragraph back into a normal style. This problem had to be solved by modifying the HTML code, which is not a usual practice for this audience. The saving at the end of the editing without any confirmation request is also surprising. Each week, news are edited by the students, presented to their peers and available for further consultation. It is a pity that we are not automatically warned when there are novelties (additions or changes). So, at the beginning of each lesson, the teacher has to make sure that there is a new subject to deal with by consulting the wiki and/or has to inquire about it by asking the students. Moreover, even if the teacher encourages them to do so, the students have not got used to tagging their documents yet, probably because they still do not feel the direct usefulness in the practice, either individually or for teamwork. Nevertheless, I introduced the philosophy of this tool (collaborative editing and tagging) to them and situated it in the context of the development of the social Web and of its potential uses for educational purposes.

User 3: implementation of a project and follow-up in team

Within the framework of a project related to building the curriculum for the course "Benefits of the media and of the ICT in teaching", my research team decided to put the result of its reflections as well as the forward planning of the actions in a private wiki. Indeed, this space must only be shared by the members of the research department concerned insofar as some practical (often internal) matters are dealt with there and as the reflection is not developed enough to be passed on to the others actors of the project. Several headings have been created, first of all reminding the objectives, the general planning of the project, and so on. Next other information was added regarding the bibliographical resources that have been completed and commented by the researchers. When one of them wanted to leave a question or a personal comment, he/she pointed it by writing his/her initials and by using italicized characters, highlighting his/her intervention. Generally, the use of the editor proved to be easy. However, the users have sometimes had bad surprises: paragraphs got mixed up, grouping highlighted words (bold) at one place on the page and some others elsewhere. Besides, as they are used to word processing, the users abandon the idea of starting the drafting of relatively complex tables and prefer inserting a link to a document written with a word processor rather than editing them with Kupu. That is what one of the researchers did when writing out a questionnaire including a certain number of cells, some of which had to be merged, include bulleted lists... The same kind of observation was made while drafting a competencies tree the researchers submitted one to another for criticism and improvement. In the last case, SweetWiki was given up, not only because it did not enable an easy management of the tables, but above all because we could not visualize directly the latest changes made by the authors. Moreover, the pages are tagged, which makes it possible to find them again easily, as well as those dealing with related issues (marked with the same tags chosen collectively), but there is still no use of ontologies strictly speaking. The team thinks that SweetWiki is a useful tool in a stage of collaborative building of a project. Despite the difficulties mentioned, we intend to go on using this kind of tool insofar as it proves to be promising in terms of edition and online tagging by different writers. We hope that the dialogue with the developers of the tool will enable to make it even more usable.

2.3 LimSee3

2.3.1 What the developer tells us about it...

Easily create multimedia sequences for the Web

LimSee3 is an authoring tool, dedicated to the effortless creation of synchronized and interactive multimedia sequences for the Web. Let us give a short explanation about this.

Multimedia means that sequences can contain text, images, sounds or video clips. Using LimSee3, it is possible to synchronize efficiently different types of media (for example, displaying a text when playing a video, the display of the text being synchronized with the video, like movies subtitles). As the productions are made especially for the Web, it is very important to use a standard language, because it has to be usable with every browser. This relevant standard is SMIL (pronounce "smile"), which stands for "Synchronized Multimedia Integration Language". This is the standard adopted by the World Wide Web Consortium to describe "rich multimedia content", like presentations, or interactive educational content. LimSee3 generates SMIL documents or other kinds of files (it is possible to export sequences as XHTML web pages, enriched with JavaScript modules (to manage the interactivity of the sequences). The specificity of LimSee3 is the utilization of predefined templates. The work of the author of a sequence is limited to two things: the search of the needed media and the association of these media with the template's elements. Currently, two templates are proposed with LimSee3.

Advantages of the SMIL language

Classical presentation software has limited interaction functionalities. On the contrary, the SMIL language enables real interactivity, creation of non-linear multimedia contents, and simultaneous utilization of many different types of media. Although it is more or less possible to create non-linear contents with presentation software (Microsoft PowerPoint, OpenOffice.org Impress, Corel Presentations, etc.), these software are not strictly rich multimedia conception tools nor multimedia authoring tools.

Nowadays, it is in cellular phones that the SMIL language is the more used. For example, it is used in MMS for exchanging short messages like SMS, but enriched with multimedia content. The HD-DVD, a standard that is one of the possible successors of the DVD, uses SMIL to manage the timing and synchronization aspects.

Technically, SMIL is an XML language (like XHTML). It is an open standard. That means that it is interoperable and perennial. A document produced with LimSee3 is readable by every SMIL player, and is editable with another SMIL editor.

On the contrary of the previous versions, the main advantage of LimSee3 is to be usable by someone without any SMIL knowledge. As Amaya allows producing XHTML without practising this language (cf. section 2.1) LimSee3 permits SMIL productions and their exportation to XHTML and JavaScript without any knowledge about them. Indeed, the objective is to address a large audience: people who wish to create multimedia sequences accessible from the Web (or any other digital support). The aim is to be accessible to a large audience, to every people wishing to create multimedia sequences, accessible from the Web (or another support).

For example, when you read on your DVD player a film in original version, with subtitles, the software of your DVD player links image, sound, and text (the subtitles). These three elements have to be synchronized. A synchronized multimedia document is based on the same principle. LimSee3 creates rich sequences, organizing various sorts of multimedia files, with a user-defined timing. It also permits interactivity, by characterizing the logic, spatial, and temporal relations between the media files (images, videos, sounds, or texts).

The user who wants to produce this sort of content has at his/her disposal two kinds of tools:

- First, some tools are dedicated to advanced users. With these tools, you need to edit yourself your SMIL files. Their efficiency is very good. A SMIL specialist will be able to take the best of the language, like a very good musician with a musical score. But these tools too complex for the non-experts.
- There are also simpler tools. But they are dedicated to only one type of media (sound, image or video) and cannot create rich sequences, with a mix of these different kinds of media. An exception is the Adobe Flash software which is not free software, and which has the same purpose. Its major defect is that it does not produce files in a public format (the output is "SWF").

The objective of LimSee3 is to allow any user to create entirely some synchronized multimedia contents by himself.

Some good reasons to use LimSee3

LimSee3 really creates multimedia documents, *i.e.* the files that integrate multiple media objects. It characterizes the links between the existing media files. Why is it a good thing? First, the files (photos, etc.) are not embedded in the document (it would be difficult to extract them from the document, to be able to re-use them in their original format). Everything is very easily reusable and a media file can be used in several multimedia products. Moreover, the size of a LimSee3 file is thus very small, what is very convenient, particularly if the goal is to publish it on the Internet. This method allows you to include multiple media objects, from various sources, without storing all files at the same place. The address of the document is used, and not the document itself.

- The internal structure of a multimedia product made by the links between the files and the way they are synchronized is different of its visible structure. The visible structure is based on the logic of the user (chapters of an online course, for example). The software follows the user's point of view and manages itself the internal structure (that the user does not need to know).
- One of the main advantages of LimSee3 is the utilization of templates. With templates, the users can create very easily some types of multimedia products. They only need to fill in some predefined fields, using simple techniques, like drag and drop. Templates can be very different from each other, and they can be infinitely developed.
- One of the goals of LimSee3 is to adapt its interface to different kinds of users. For example, it could hide the advanced tools for a beginner using a template. The users can also reorganize the template workspace (move the elements, modify dimensions, etc.).
- The advantage of the following property is maybe less evident for users: LimSee3 can export its presentations in different formats (SMIL, XHTML).

2.3.2 What the learning specialist tells us about it...

An example: the ProfTICE community

In Higher Education, a course addressed to future teachers deals with the pedagogical uses of Information and Communication Technologies (ICT), but there is no "training curriculum" defined about it. For this reason some teachers decided to organize meetings so that they could exchange their notes, their tools, and discuss their method. It became the community of practice called "ProfTICE". These teachers have chosen LimSee3 as a way to elaborate and exploit documents that they will be able to share later on: sound files, videos, images... already included in some presentations and courses, or not. With LimSee3, they have the opportunity to enrich their pedagogical and didactical presentations, particularly concerning interactivity between media and accessibility. Indeed, it synchronizes several types of media and makes them interact with each other, creating links between them. Moreover, the produced document and the data it contains are accessible on the Web, for every teacher who wishes it. Greg, a teacher of this CoP, recommends his colleagues to use (and to stimulate the students to use too) the "Quizzou" software to make his online evaluations. This software allows to quickly create online quizzes consisting in multiple choice questions. These one can also be stored and managed in items banks where the teacher can select existing questions. To induce this usage he shares

a first pack of resources. He creates a new library called "Quizzou course", with about 30 files. On the basis of a LimSee3 template, he elaborates a multimedia presentation. His aim is to convince his colleagues to use "Quizzou". It uses the resources of the library: screenshots of the software, sound files with comments about these images, abstracts of a video containing the methodological explanations on the way he approaches the question of evaluation with students and about the way the software he proposes can sustain some evaluation practices. Each colleague member of "ProfTICE" can then visualize Greg's presentation. Moreover, he can use for himself the elements of the presentation. Afterward, interested by the elaboration of tests by his students (using "Quizzou"), one of the teachers creates a more complete course, exploiting the same data, and some other, from new libraries (interview of an expert in evaluation, text about the rules of the design of multiple choice questions, short personal comments...). He articulates and synchronizes them, using another available template of LimSee3. This course is also used by other colleagues with some minor adaptations (some examples are modified, depending on the discipline of the target audience).

From this time, the teachers use regularly LimSee3. They take advantage of the readiness to integrate and synchronize different media, to conceive some presentations combining comments and images when the content of the screen is scrolling. These resources are accessible at a distance. Some of them even replace some parts of classical (face to face) courses. The explanations which are usually directly given by the teacher are replaced by the different media: videos, comments about schemas, presentation of exercises, examples, simulations (animations)...

Finally, the teachers argue about the relevance of the creation of new templates, and the automation of some operations. They would like a template to be able to represent some "programmed cases", that are particular sequences, which are based on concrete themes (for example the case of a controversial situation in a collaborative online learning system). A series of "real life" stories are presented, using an introductory text, or a short video sequence. Each episode of the story is followed by a multiple choice question about the reaction of the participants (the learners and their tutor). Among the proposed elements is the event that happened in the real situation. There are some comments about each possible answer. These cases can be considered as didactic materials, they are used as a basis for debates about the theme.

Reflections

Produce and share knowledge, enrol newcomers

The design and the use of multimedia presentations to present information on a topic become more and more usual during seminars, and especially during training sessions. Multimedia online presentations are developed to address a need of time flexibility and to take into account the diversity of the cognitive styles of the target public. They are also a way for CoP's members to produce, share and reuse information that will enrich the CoP's resources. Through the use of this kind of presentations, CoP's members can be informed or learn about CoP's topics. New incomers can for instance be introduced to the culture of their CoP (objectives, rules, who is who, etc.) so their enrolment can be facilitated.

A tool dedicated to many teaching-learning paradigms

What is LimSee3's place in the learning and training domain? The multimedia contents made with LimSee3 could instrument activities connected to various learning-teaching paradigms (Leclercq & Denis, 1998):

- reception/transmission: talks of the teacher for a students group, instructions for use, etc.
- practice/guidance: linear (Skinner) or branched (Crowder) programmed courses, exercises,
- preparation to a debate: start the presentation of a problem situation, programmed cases (De Waele, 1975), etc.
- exploration/feeding: non "delinearized courses" (Leclercq et Pierret, 1989),
- creation: projects made by the learners,

- imprinting/modelling: video providing models to imitate, etc.

The existence of new templates, characteristic of some learning situations, would make the production of didactic resources easily reproducible for other themes. The development cost would be inexpensive and easy to broadcast, to complete or to rework by other teachers. Moreover, the presence of multimedia data can, depending on the organization made by the designer of the didactic resource, permit to make sequences respecting the diversity of the cognitive styles of the learners. Nevertheless, at this moment, you cannot expect LimSee3 to be a very flexible nor interactive tool (in terms of teaching strategy, and learning management).

Accessible and reusable presentations and data

The organized exchange of teaching products (presentations, planning of lessons, courses notes...) is not yet a usual practice among teachers, but different studies about ICT educational uses (Hubert et al, 2002 a; Hubert et al., 2002, b; Fontaine et al. 2008) show notably that they use the Internet to search some information that could help to prepare their courses. Generally, they include these data in didactic resources. Whatever the users are, the use of LimSee3 to share elements improves the mutualisation of the resources libraries (personal resources, or already available on the Web). They can build or modify multimedia presentations on a great number of themes. The fact that the libraries can be uploaded from the Internet gives a large choice of media that they (re)use in their own way, articulating and synchronizing them according to their needs. Their task is simplified by the use of a template provided by LimSee3. An asset to motivate them for sharing documents and use documents provided by the others is the adoption of standards. Indeed, as said before (in the developer part), LimSee3 enables SMIL and XHTML exportation.

2.3.3 The interface as seen by a user

Some situations that could raise some problems for users have been highlighted through a first ergonomic analysis. Many of these remarks have already been taken into account in the current version and some other will be taken into account soon. However, LimSee3 is far from the end of its development and some other adjustments will have to be done in the next months.

Usual goals

The task that have to be done by the user is relatively clear, the goals are a few and easy to identify. To describe the difficulties that can occur using the interface, we took the following goals into account:

- install the software;
- start;
- constitute and manage media files libraries;
- create a presentation (sequence) from a template.

Let us have a look on these goals.

Install the software

The installation of LimSee3 is the same whatever the operating system is. To install LimSee3, we only need to click on the web address of the installer (which is an updater too). A window opens up automatically and the installation starts like any other software. The steps are listed, for information about their setting. At the step "choose version", we have to choose the version that we wish to install. As every new version is made to provide new enhancements and solutions to some ergonomic problems, it is clearly better to choose the more recent version (figure 21).

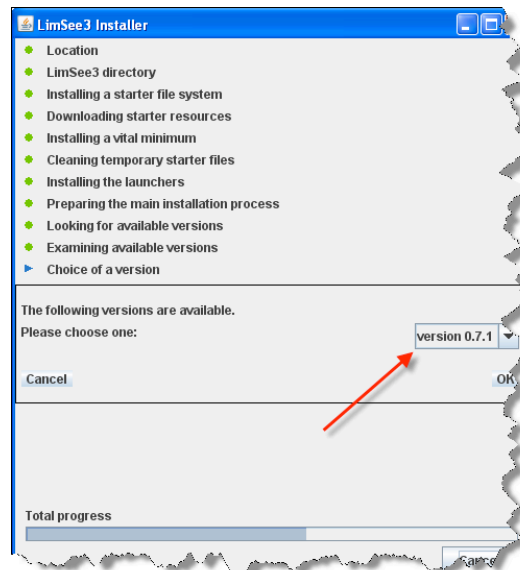


Figure 21

Start

At the beginning, the homepage (figure 22) describes briefly different possible actions about using LimSee, illustrating the template which is available to edit a presentation. A presentation can be created, at this moment, but it is impossible to edit a multimedia presentation without having any media library (cf. following point).



Figure 22

Constitute and manage multimedia files libraries

To create a multimedia presentation, some basic material is needed: media files. The first thing to do is to constitute some media libraries. The resources of these libraries will be reused in many kinds of presentations. To create a new library, click on file -> new library. A window opens up. Then we have to name our library. When it is created, the space which is dedicated to libraries opens on the left side. Several libraries can be opened simultaneously. In our example, only the library that has been created at this moment ("Lib1") appears. It is still empty (figure 23).

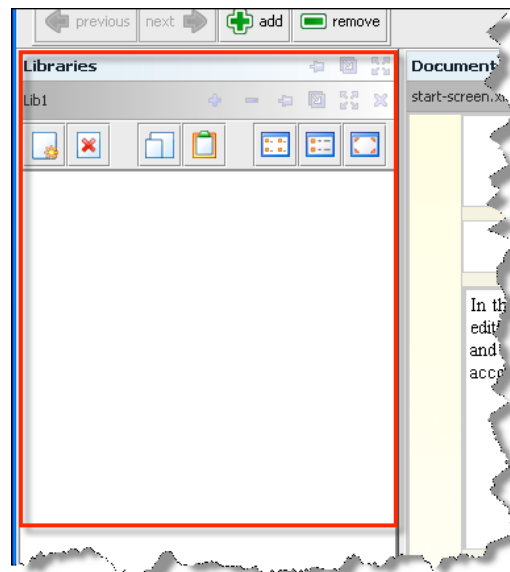


Figure 23

Of course, we can open an existing library too. Let us note that, when this library is opened, the toolbar does not appear entirely. We have to resize the libraries area to obtain what we see on figure 23.

To add some media files (images, sounds, videos, etc.) we click on the left icon (figure 24, white icon with a small star). A window opens. We can use it to choose our media files. There are two ways to do it: to explore the folders of the hard disk of our PC or to give a web address that points to the file to be added. The preview of the media files makes the choice easier.

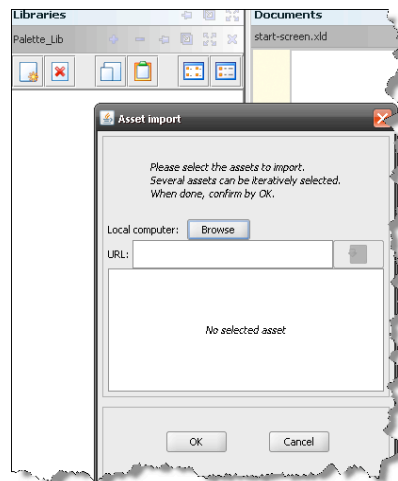


Figure 24

We can also simply drag & drop a media file from the Internet, using the mouse. Practically, we just have to navigate on the Web, to find interesting pictures (for example), and to drag them to the library. Take care of the fact that the libraries contain only the addresses of the documents (the documents are just referenced)! The advantage is that we do not need to retrieve and store the elements each time we create a new product. An element can be used several times without taking any more space.

It is of course possible to delete the references in a library (icon with a red cross).

Besides, in the library, several views are available. The media files can appear as a list (with or without details) or as previews (figure 25). The "preview" display mode does not display at this moment (on some systems) all the supported files (for example jpeg files under Linux).

A list of the supported files will be provided soon. Moreover, the previews are partially displayed because they appear in their original size and are not adapted to the window's size. However, we have the possibility to reduce the size of the previews so that they could be all visible.

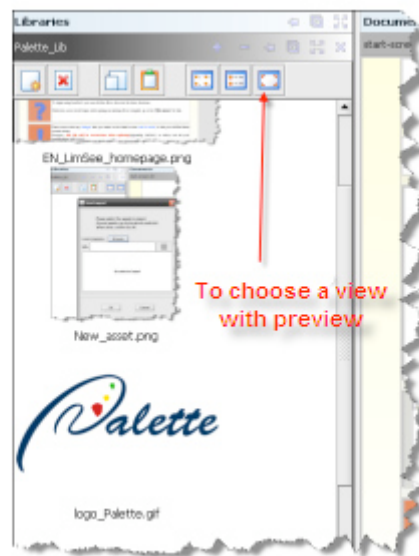


Figure 25

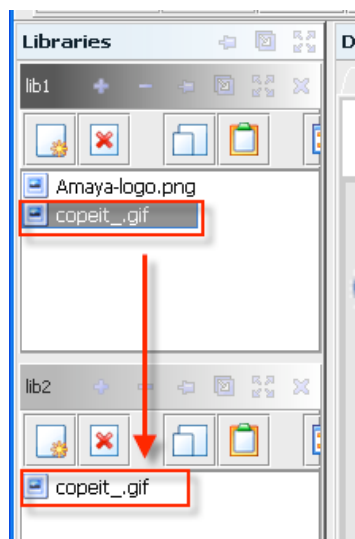


Figure 26

In the current version, when we open a new library, the library that is already open will be hidden. That's why we will have to click again if we want simultaneous access to both of them.

Each library has an inherent space in the libraries area. Then, all the media files can be dumped or copied very simply from a library to another (drag & drop, "copy" and "paste" icons, copy and paste with the right button of the mouse,...) (figure 26). The use of the usual keyboard shortcuts is possible too (to delete, copy, etc.).

There is no menu or icon to save the libraries. When we quit the software, a window opens up and asks if we want to save it (figure 27).

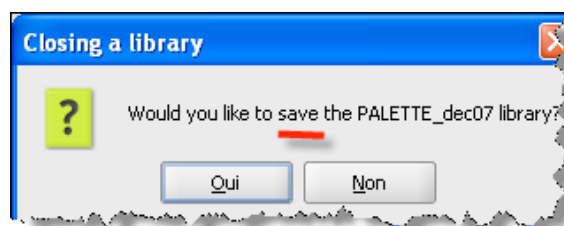


Figure 27

Let us note that currently when we save a library and afterwards try to open it, the library does not appear. To be able to open it, we have to modify the extension of the file so that it could match with the file types that can be "seen" in the open windows. We just have to add ".xml" at the end and it works.

Create a presentation, using a template

The only template which is now available for everyone is the slideshow template. It enables to easily create a series of slides containing some media files. First, we have to open the template, exactly as for any other documents (*open document* menu). We obtain a page with a first slide. In this slide, there are

areas in which we will be able later to insert our media assets. In each area, there are symbols showing which types of media assets can be used (figure 28). The big symbol, in the middle of the screen, represents the background image: if we drag and drop an image in this area, it will become the background image. Be careful! When we add a background image, we cannot delete it later. We only can replace it with another one.

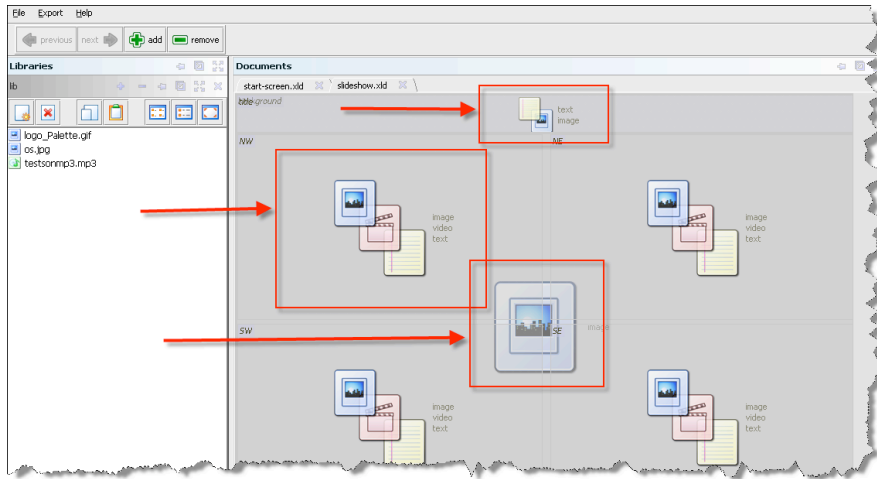


Figure 28

Something else: a double click has no action on the different areas of the template (for example, we cannot open a new text by double-clicking on a text area). It is also not possible yet to modify the layout by moving or resizing the media areas. This could have bad consequences on the look of the presented media (cf. example of the Cope_It logo, in two different areas - figure 29).

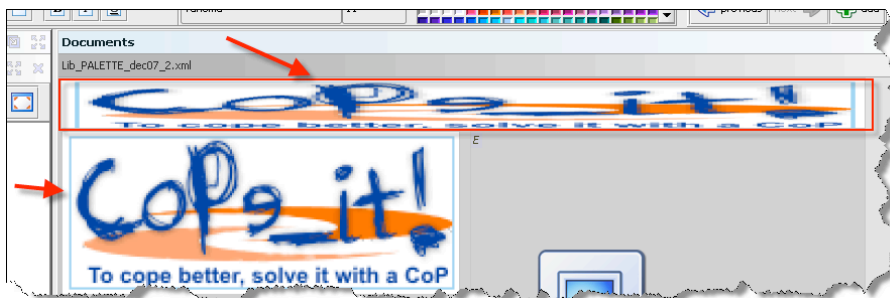


Figure 29

In order to add another slide, just click on "add". Then a window appears and we have to choose if you want to place this new slide before, or after, the current one (figure 30).

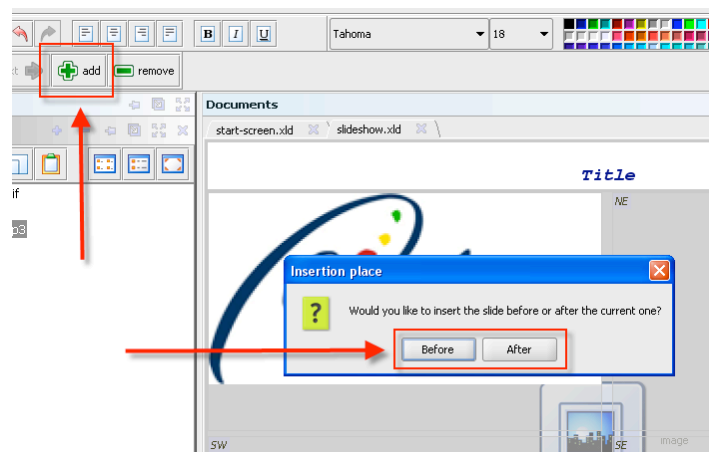


Figure 30

At this step, we can choose between the different types of slides that are available in the template: one media by page, two, or four (figure 31).

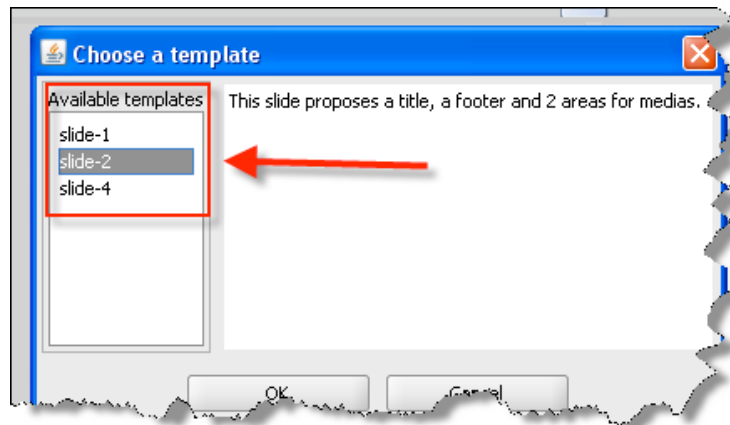


Figure 31

To insert an image (or another media) in our presentation, we just have to drag it from the library to the presentation. The way to insert a text is different: we have to click on the right button of the mouse, and choose "start a new text". A text toolbar will appear (text colour, alignment, font, etc.) (figure 32). Notice that this contextual text editing menu cannot be closed after the creation of the text.

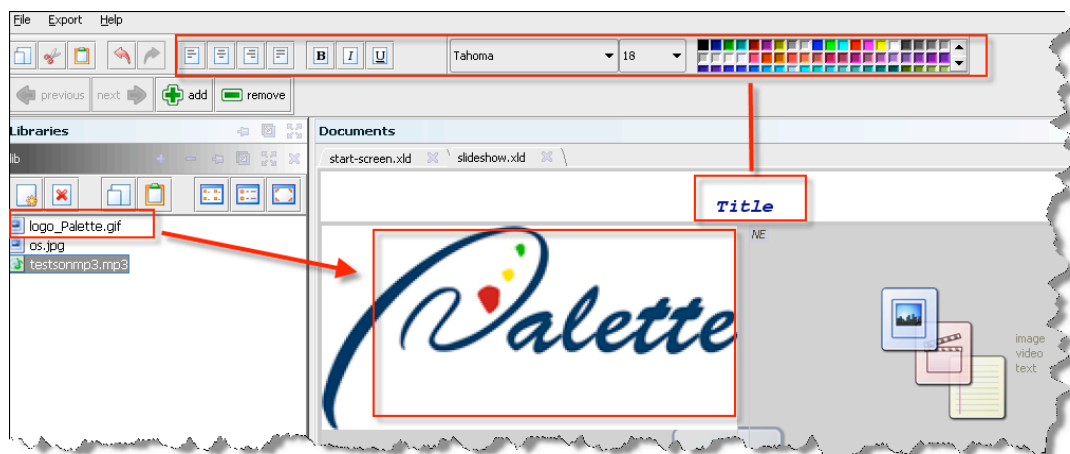


Figure 32

At this stage of the development of LimSee3, when we enlarge a text, a part of the text can be hidden (figure 33). A part of the text is out of the text area because it is not possible to resize this area (and the text cannot be centred).

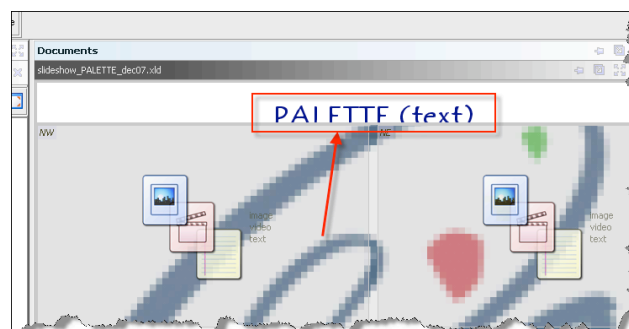


Figure 33

Another thing that we need to know: in text areas, it is possible to cancel the operations that have been made by mistake, but that is not yet possible in the other parts of the software. And in the current version, some areas are only visible in full-screen mode (for example, the text area at the bottom of the slideshow template).

One of the key points of the creation of multimedia contents with LimSee3 is the synchronization of the constitutive elements. Currently, this synchronization is only possible when using an appropriate template. Indeed, a second template which handles synchronization is currently being tested.

We can also create some other documents or open existing ones. But there is not yet direct link in the menu to the last opened documents. What does happen if several documents are opened (and not only several slides of the same document)? Each document will be embedded in one distinct tab (figure 34). We can click on the cross which is on the tab to close the document (like in many software tools, Firefox for example).

Be careful! When we are trying to open a presentation, if we click by mistake on a library (what is possible, at this moment), nothing will happen and an error will not be reported.

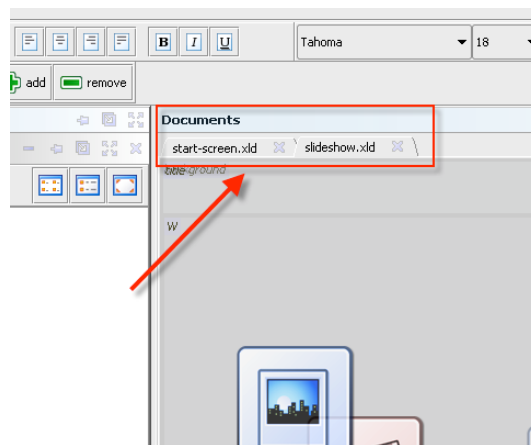


Figure 34

Finally, we can export our presentation to various formats (or rather you will be able to do so soon). To export in SMIL we have two possibilities: the texts can remain as texts (they will be easily modifiable later) or they can be transformed into images, for a better rendering (but it will be more difficult to modify them if necessary) (figure 35).

In the next version a small adjustment will enable this exportation (which is already implemented, but currently not usable due to interface issues). This will be very useful.

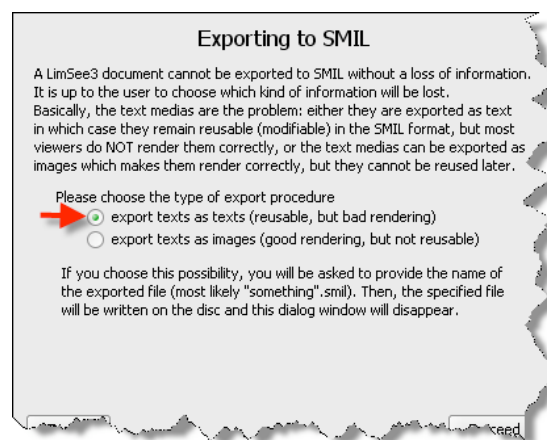


Figure 35

Exportation to XHTML will also be available soon.

Recommendations

Contrary to what its name could evoke, LimSee3 is new software, different from LimSee2. It has been totally rewritten since the exploitation of LimSee2 was too difficult for a novice user and because a brand new document model was necessary to introduce templates. This situation has two consequences at the ergonomic point of view. The first one is negative and the other one is positive.

The developers have much work to implement all the features of the software, and it is difficult for them to manage in parallel the ergonomic aspects of the interface.

It is easier for them to take into account the remarks from the users (notably about ergonomic issues to elaborate an interface as intuitive as possible) because the development is still running.

But LimSee3 is not developed enough. We shall draw more conclusions about its ergonomic qualities during a further analysis. It will occur in the next months and will contribute to the participatory design of this tool. We can already say that the development principles (involving the users all along, and aiming at having a user-friendly interface) are interesting. But we will not really be able to judge of its interest for the users until several templates are implemented. Currently, we can only test the software, we cannot really use it. We are giving some feedback about the interface and some ideas for the creation of new templates.

2.3.4 Experiences

User 1: Edition of an history multimedia course

I have used LimSee3 when it was still in its development phase with the help of the developers to make a multimedia interactive history course for students of "hypokhâgne BL". The course named "The 1914-1918 War and the painters" is available on the ePrep platform in the "history" domain (<http://62.212.103.221/eprep/>).

The inconvenience of manipulating a tool that is not very user-friendly yet is balanced by the advantage of being able to have an impact on the development decisions. Thus, as I have requested, a window has been added under the window of the slides, where it is possible to post comments. This functionality has been appreciated by my peers when I presented them this production. They have even suggested the idea of a keywords search for the comments. This simple example shows that the implication of non-computer scientists in the development of a tool makes it easier to adopt.

What I particularly like is the interactivity for the user. My pedagogical project is indeed to let my students save time, avoiding the repetitions of courses, and to dedicate more time to the preparation of the examinations. Consequently, I planned to make my LimSee3 courses available online for my students. I could have thought to put these courses online as podcasts, but I would lose two aspects: the possibility to add keywords in the comments, and the interactivity. The ideal possibility would be able to link the interactivity of the outline (already available) and the research on the comments.

For these reasons, the LimSee3 software, even if it has to evolve to be user-friendlier, is a promising product.

2.4 CoPe_it!

2.4.1 What the developer tells us about it

A tool for mediation and collaboration

CoPe_it! is first presented as an online mediation service, including support for collective argumentation and decision making. In its latest versions, the developer puts forward the fact that it's mainly intended as a collaboration service. So the field where it can be used is rather wide. Collaboration can happen through different kinds of interaction: expressing an opinion, a judgement, bringing nuances, commenting, all this leading at best to common decisions, the production of documents in the broad sense or carrying out a project. It is therefore understandable that a collaboration service has to offer its potential users among whom of course the members of a community of practice, functionalities which favour these different types of interaction. However, a difficulty crops up. It resides in the fact that this collaboration happens from a distance, with all the problems posed, for instance in a discussion, by the asynchronous character of the interactions. So apart from offering the users the possibility to put their ideas within other persons' reach, it also has to help them to realize that some interventions take place, and more widely, to help them to comprehend in different ways the development of this collaboration.

CoPe_it! objects and functionalities

CoPe_it! offers a certain amount of elements to try to confront these difficulties. Let us sum them up without going into a deep analysis of their relevancy at this point.

Creating one's own community, one's profile and workspaces

When connecting to CoPe_it! the first time, we automatically get into the "Earth" community (Earth Planet), which, as its name insinuates it, is common to all users of the service. It is therefore possible to create there one's own community with a management system of users, rights and invitations. It is within one of these communities that the CoPs work will take place. When we are part of a community, and with the *ad hoc* administration rights, it is possible for us to create workspaces that will be private or public. A management system of the invitations and authorizations is implemented there. Each member will be able to create his/her own profile in a rather standard way, to be more than an identifier for the other community members. Usual items can be found in the profile manager (picture, e-mail address, street address, list of the communities the user belongs to).

Integrated Web tools

CoPe_it! offers in a smaller window a browser in the browser, *i.e.* a system enabling to browse Google, Wikipedia or any other site. The Web feeds which are managed like bookmarks, make it possible to create bookmarks within this internal browser. These bookmarks will be available for consultation when you use CoPe_it! and its internal browser later.

Objects for reifying interactions and resources

In order to enable the user to give a semantics to the interventions of the people taking part in a mediation activity (let us use this expression before seeing which forms it could take), CoPe_it! offers to encapsulate them in three kinds of objects: ideas, notes and comments. The contributor's name is obviously an important parameter that can not be modified. An idea is represented with a light bulb, a note with a pencil and a notepad, a comment with inverted commas. These iconic representations enable to visualize a discussion as a set of interventions. As we will see later, these interventions can be linked to one another, what changes the space into an outline or a graph. You visualize the content of one of these objects by clicking on the icon representing it. As it concerns interventions in a mediation activity, the content of these can not be changed. On the other hand, a participant has the right to change his/her mind as regards the semantics he/she gives to the interventions. He/she can change an idea into a note, a note into a comment, and so on. This possibility applies to the whole set of interventions, and not only to his/her own.

Resources for arguing

These resources can be of different natures and can be considered as files for an operating system: a text, an image, a video... of any format. The resources are also represented in the form of icons and can be developed in a window with a single click. Given their obvious visual nature, the images and the videos can have a particular status and be incorporated, in other words they can directly appear in the structure.

Objects for reifying interactions and effects for describing them

To structure the collaboration activity, the participant uses arrows. The use of these arrows is not forced on. Arrows can link any object to any other one, in any direction. A descriptive and modifiable text can be associated with them so as to give semantics to the relation. Another way of describing the relation is the use of style effects. A colour code can enable the users (and probably the system as well) to classify an intervention (in favour of an idea, of a note, against it, neutral...). The thickness of the arrow can graduate the vigour of the intervention.

Objects for facilitating the reorganization of the collaboration

The developers of CoPe_it! insist on the fact that the service enables the persons taking part in a collaboration, to let it develop towards several "projections" (see below). One of the means at the participants' disposal for this purpose is the possibility to define rectangular graphical spaces so as to bring some objects together visually. However, these graphical zones remain independent from the objects they seem to contain.

Functionalities for doping the interactions

CoPe_it! copes as follows with the difficulty people encounter while discussing in an asynchronous way: the participant can visualize the list of the other participants connected and contact them via a chat system. Let us note that he/she can also do it by email.

Functionalities for helping users to comprehend the state of the collaboration

In the CoPe_it! 2.03 version, three different views of the collaboration activity are presented:

- An informal view (*desktop*);
- a formal view ;
- a time-ordered view.

The desktop view is also the most dynamic as the objects can be created, moved, brought together by clicking. It is easy to copy and modify it, which enables the participants to produce different representations of the same activity. It is the view where the possibilities to act are the richest. The formal view is a simplified transformation of the desktop view. It sequences the interventions and organizes them into a hierarchy taking some parameters into account such as the relations between the objects and their features (namely, for and against). In this view, some interactions are possible (for instance, adding an opinion). However, there are fewer possibilities than in the desktop view.

The time-ordered view enables to find the interventions in the chronological order of their appearance. It is some sort of history or instrument panel. It does not give the possibility to interact as in the preceding views.

The projections

To be complete, let us point out that the developers speak about the possibility to let the representation of an activity develop towards different projections. In a way, these are different forms of an activity. Let us take a comparison. When we have to write an article on a subject we know well, the approach could be to put the main ideas we want to develop down higgledy-piggledy on paper, even illustrations, comments, and so on, first not caring about distinguishing the non-essential from the essential or about the status of the different snatches of sentences we are writing. Next, we could try to draw up a outline emphasizing the important ideas, by specifying a little (highlighting, for instance), the semantics of text extracts (an example, an important idea, a diversion). Then, starting from the outline, we could go into a more intense writing phase, etc. With CoPe_it!, people taking part in a

collaboration activity can go about it in a similar way. They decide how they want to work, according to the kind of activity. If they have to define a common project, they could come to an agreement about the procedure and decide to launch in a brainstorming, next in a discussion about its organization leading to a clear definition of the project, a definition of the roles, and so on. By offering room for manoeuvre, CoPe_it! makes such an approach possible. However, it is not the tool that leads to it. The users (participants) have to initiate it.

2.4.2 What the learning specialist tells us about it...

We consider here three kinds of tasks which, according to the CoPe_it! developers, can be part of one scenario:

- identifying and solving a problem,
- managing a project,
- debating about a subject, topic, theme.

These tasks are part of the CoP's needs. They are repeated below, in one single scenario, but the CoP could use the service for only one of them. We will then look objectively at the presented case, to understand the process relating to that kind of tasks and we will bring out practices and advice bound to the use of CoPe_it!

An example: the evaluation of student nurses in training

Within a nursing college, teachers encounter difficulties in evaluating the students training objectively. They assess the medical care given, and thus the perfect command of the care techniques and the adequacy/appropriateness of their professional acts not only in preventive, curative, palliative fields, but also in readaptation and rehabilitation... Even if all these evaluations are about the acquisition of basic nursing care, they notice significant differences between the schools in terms of results and process. These teachers who regularly meet one another, have got used to discussing these matters and trying to solve the problems. By using CoPe_it!, they have had the opportunity to transpose their community of practice virtually by creating a community with CoPe_it! Therefore, they meet from a distance around a white board and a forum. Through the (private or public) workspaces created by the CoP, teachers share their evaluation tools and modes, and place there resources of different natures (video, documents, images...), related to the content of their class and the training periods they have to evaluate. These exchanges enable each teacher to enrich his/her directory of practices, to discover other ways of managing a task or solving a problem, and to acquire new knowledge. CoPe_it! makes individual and collective learning possible.

During discussions, teachers realize that they do not evaluate the same skills and do neither formulate precisely evaluation criteria nor their weighting. Together, they identify the nature of the problem encountered.

So as to overcome this problem of subjectivity in their evaluation, the teachers decide to build a model/scale listing the skills for the basic nurse care with well-defined criteria. So the service favours the collaboration between teachers for carrying out the project. To build this tool, by giving their opinion, the teachers discuss not only the skills to be acquired by all the students but also the evaluation criteria to implement. The service encourages everybody's participation. It is used as a mediation tool between the different CoP members. The teachers weigh up the pros and cons within a collective argumentation work. They use different means (objects, arrows, frame, colour code...) to tag, structure their (dis-)agreements. Some teachers even go further, looking for information thanks to the in CoPe_it! services inserted (such as Google, Wikipedia,...) to support/back up their opinions. Finally, the scale is built. The CoPe_it! animator suggests a vote for the adoption of the scale. If a majority comes out, it will be adopted by all members, with a possibility for everyone to adapt the points he/she does not approve. Unfortunately, CoPe_it! does not offer in the present version an automated system for a simple implementation of this vote. This will be available soon.

Reflections

Complex tasks

Whether it be the collective solving of a problem, the implementation of a project or a topic to discuss, the achievement of the task consists in setting a shared definition of the problem to cope with, in defining the project to carry out or the matter or topic to deal with. In this CoPe_it! workspace, each member of the CoP can first express an opinion, the way he/she views things. This verbalizing represents a commitment of the person and an investment in the long term. Each individual must have the opportunity to tell his/her personal opinion so as to combine them later with collective values. CoPe_it! enables him/her to express his/her own values, but no specific functionalities to encourage the users to this process. Through social negotiation, each individual will have to conciliate some points of view in order to build a common conception of the problem, of the topic, of the project. So this is the illustration of a social co-construction of the knowledge. It is a result of a sometimes slow and complex interaction process that could be facilitated by adding some features to the service.

Precautions to take

Depending on the cases, the negotiation of the topic to deal with spontaneously succeeds or fails. Sometimes, a leader emerges in the group or an animator proves to be necessary if the situation is locked. Indeed, even between adults, cooperation often remains a process to learn. Implementing it through an artefact such as CoPe_it! can give birth to a new motivation, or, on the contrary, bring an additional difficulty depending on the users' familiarity with the service and its usability. If the sharing and appropriation of the objectives in the project does not succeed, there is every chance that the persons will quickly give up the work in progress and offer a pseudo-resistance to using the tool as they will not have the opportunity to satisfy their need! So there is a risk that the CoP member might not find any direct and personal interest and end up getting bored. It will be difficult even unnecessary for him/her to make efforts so as to make a success of other persons' project by taking part in a problem he/she is not interested in. And if we want these individuals to exchange, it is also necessary to have a well-defined topic of discussion. However, collaborative learning is neither limited to a juxtaposition of ideas nor to the acceptance of an opposite point of view. Of course, the confrontation of ideas can highlight common points, shared opinions and similarities. But, on the contrary, the process gets complex through a socio-cognitive conflict or a controversy which is "solved" through social negotiation and it most often leads to a readjustment or increase of knowledge. The transition via the comparison of points of view enables each member of the community to put the same meanings behind the same words and to have an integrated perception of the project, problem or matter to deal with. Then the CoP can choose its way. The members are co-responsible for the project or the debate and collaborate and exchange because they have identical goals resulting from a mutual interest. Note that it is not because the project has been defined at the beginning of the collaboration that it will remain unchanged. Indeed, a project evolves. Adjustments can be carried out as people go on collaborating thanks to the bringing-in of the different CoP members.

Collaborative learning/training

The enrolment also has to be foreseen, *i.e.* sharing out of the parts between CoP members is required to ensure a collaborative learning. It is also used to consolidate and clarify the relations within the CoP. Each member has a knot of internalized knowledge. On the periphery of this knot, there are zones of proximal development (ZPD by Vygotski in Vergnaud, 2000) where the knowledge is not well-established yet. These ZPD of some persons coincide with other persons' "knot" zones (Lewis, 1998). So the knowledge of the community is wider than an individual's knowledge, each community member can thus contribute to the cognitive development of the group by giving the others a "scaffold" (or shoring according to Bruner, 1983) in fields where the knowledge is not available yet for autonomous work. In this way, each CoP member will contribute to the collaborative work and to the mutual learning by letting the other share his/her knowledge.

Obligated phases

For the moment, the service just helps the user to implement only a part of this process as some phases seems to be missing. By comparing the theories in the sociology of translation (Amblard & al., 2005;

Callon, 1986), of the Problem-Based Learning or PBL (Leclercq & Van der Vleuten, 1998, and pedagogy of /through the project (Arpin & Capra, 2001; Bordallo 1 Ginesti, 1993), we can bring out some similar stages. We define four phases through which the members of a CoP taking part in one of the activities should go, even if these do not follow one another in a linear way (dynamic process). As we have already explained, the first phase results in the emergence of the project, the setting of the problem or the definition of the topic. This consists in analyzing the context with an elucidation of the concepts and the actors' expression of their needs, their interests and their assumptions. The actors try to come to an agreement and to work in the same direction. During the second phase, the actors plan the way they are going to proceed to implement the project, to deal with the matter or to solve the problem. To do so, they make anticipations, formalize common objectives. They get organized, and share out the tasks. It is also important to examine the feasibility of their method in terms of inventory of their strategies and possibilities for them to act. The following phase is in line with the achievement of this planning phase where, depending on the task, the actors have to carry out individual surveys, to put strategies in place, to achieve the project, to solve the problem. It is also during this phase that the actors exchange and pool their bringing-in. Finally, during the fourth phase, the actors criticize the others' bringing-in. It is time for the report and the evaluation that can lead to making decisions and regulating. This phase requires vigilance and transparency to preserve the quality of the relations in the group.

What CoPe_it! has brought in

In these four global phases, we only find the achievement phase in CoPe_it! In other words, the organization of the phases of definition, planning and estimation of the project or the topic are left aside or trusted to the users. We think that the service could help a lot by implementing functionalities to support these phases. Specific procedures could enhance the collaborative process. As an example, as far as the last phase is concerned, CoPe_it! does not foresee a place where the actors can post their final decision: a suggestion of solution for the problem to solve, a global evaluation of the project or a synthesis summing up the main ideas resulting from the debate. Another illustration: underestimating the phase of problem definition represents a risk regarding the chances to complete the task. So, if the community members directly debate on the theme, they may not speak about the same thing or approach theme aspects in isolation. Everybody risks giving his/her opinion once punctually without follow-up and without real comparison. It can also lead to misunderstandings and unsuccessful exchanges without follow-up or on the basis of which it becomes difficult to bring out trends, to make decisions, to carry out learning. At this stage of the development of CoPe_it!, we advise the community to create several workspaces to concretise, in a slightly artificial way these different phases.

2.4.3 The interface as seen by a user

According to the developers, the CoPe_it! service supports the mediation and collaboration processes by enabling, among other things, to achieve tasks bound to the identification and the resolution of a problem, the management of a project, and debates around a theme.

Most common goals

CoPe_it! appears in the form of a white board on which you place objects you want to link to each other and in this way create associations.

Other views are also accessible like for instance, a *Formal view* and a *Time-ordered view*. The task we are going to analyze is more specifically the debate around a theme. The aims we sum up are the following ones:

- entering a community
- adding an object to take part in the debate,
- structuring a workspace,
- handling the objects,
- collaborating in an asynchronous way.

Before starting the analysis of these goals, let us put forward that as far as usability is concerned, the first difficulty we encounter as French-speaking user is to work on an interface in English. At this stage of the development, it is impossible for us to choose the interface language. This difficulty has been reported to the developers and we hope that, in later versions, the choice of the interface language will be possible. Let us now sum up the goals, we will analyse them through CoPe_it version 2.03.

Entering a community

This does not pose any problem to us as when we get connected to CoPe_it!, we are part of the Earth community. For the rest, entering another community happens through an invitation, or a demand, on a very intuitive way, with the commands in the menus.

Adding an object to take part in a debate

When a new workspace has just been created, what can we see? A virtual white board we have to complete to launch the debates. How? The menus do not give any help. There are no contextual menus such as the ones we are accustomed to. Before entering CoPe_it!, the best solution consists first in consulting the "Welcome to CoPe_it!" workspace and skimming the information about the different objects so as to discover a few subtleties (not very easy and intuitive approaches). For instance, to add a new object, we have to double-click in the workspace. In this way, a window opens up offering the possible objects (figure 36)

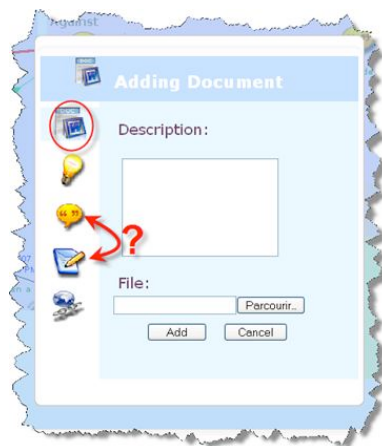


Figure 36

The next difficulty consists in a correct choice of the object we wish to insert. It is not obvious to understand the specificity of each type of object. Then we have to understand how to establish links between the objects (see sections 2.4.1 and 2.4.4).

Structuring a workspace

Structuring a workspace is not easy. A first difficulty comes from the slow reaction of the interface. If we click on an object and try to move it, we do not get a direct reaction. Same thing when we wish to resize an object. The very wide workspace requires frequent use of the vertical and horizontal scroll bars. As far as tedious manipulations are concerned, let us also point out that it is not

possible currently to select several objects at the same time so as to move them as a whole: the objects have to be moved one by one.

Structuring a workspace also requires establishing relations/links between objects. CoPe_it! gives the possibility to create positive relations such as "The content of this object (document, video, comments...) contrasts with the content of that one". It is also possible to vary the thickness of the relation line in order to insist visually on its strength. This happens by using the icons appearing when we click on the object. These difficulties can not lead us to structuring the workspace quickly, it might discourage a new partner from entering a debate in progress. Indeed, the icons associated to the different kinds of objects do not enable a quick decoding of a debate structure (cf. figure 36: the different kinds of object).

Handling objects

It is not always easy to manipulate the objects and the icons associated to them. For instance, the red cross is used in other parts of the service to close a window. Now, as far as objects are concerned, the same red cross is used to suppress the object selected... without any possibility to cancel the action (figure 37).

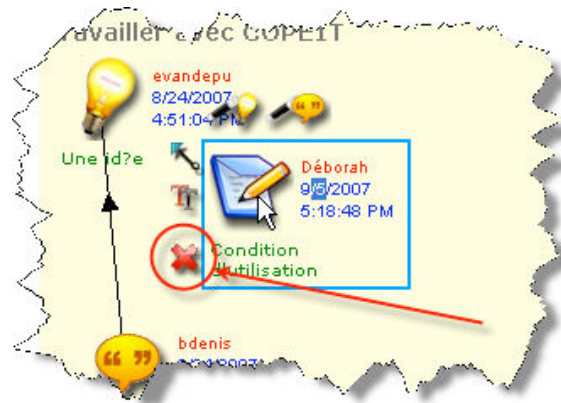


Figure 37

Let us reemphasize that it is not possible to modify/change the content of an object, whether we wrote it or not. If we understand the developers' intentions and their view to avoiding the loss of the thread in a debate, yet we deplore this rigidity because an opinion can change during a debate and blocking it also means not giving place for the debate to evolve/develop. We probably all remember debates being present in front of a non virtual white board where, discussions flowing easily, the animator writing on the board had to rub out, adapt, rewrite the different connections in the debate in order to refine its content and meet/respect everybody's opinion. The service does not make this possible. Currently, users embarking on the virtual board adventure, have to keep this in mind and act accordingly.

Collaborating in a synchronous way

Refreshing the screen does not happen automatically. In case of synchronous work with one (or several) user(s), it is necessary to think of activating regularly the refreshing (button) so as to be able to take the latest changes into account. The reloading of the workspace is relatively long. Moreover, the chatting functionalities are not active. And yet they could enable the protagonists of a debate to come to an agreement in a synchronous way, which seems to us to be a tremendous advantage for a smooth unfolding of the debate.

In an asynchronous collaboration, the main difficulty for the newcomer in a debate is to understand the structure/logics of it (example in figure 38): we have seen that the organization of objects is not intuitive. We have to build our own table for the reading.

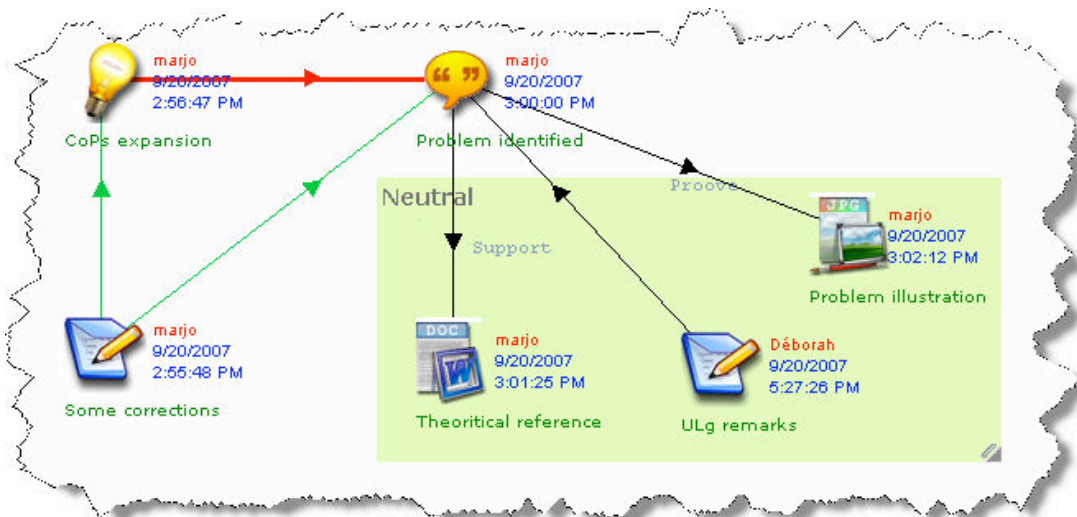


Figure 38

Recommendations

As an advice enabling to debate around a theme, CoPe_it! could be useful. In the version analysed (2.03), the refreshing of the screen is much too slow to enable a fluent use of it, and this is even more true since the management of the workspace is rather difficult. The system seems to be missing functionalities to make it possible for the debate to unfold in good conditions and in a synchronous way, from the very beginning to the end. We formulate the wish that the developers will manage to solve the usability difficulties mentioned that eclipse/overshadow the qualities of this still interesting interface from the graphical point of view.

2.4.4 Experiences

Here, we present the opinions of two users, one of them belonging to a CoP which is a learning community, the other to a researchers team who had to collaborate on a task requiring the collection of resources.

User 1: analysis of cases in anticipation of tutors training

The LN team represents a community of practice grouping students and researchers in different universities. They form work groups and collaborate from a distance on a project aiming at the education/training of future teachers as regards the integrated use of the Information and Communications Technology (ICT) in their pedagogical practices. The essential part of this work consists in building pedagogical scenarios/patterns by having recourse to the ICT. It happens on a virtual campus grouping the students under the tutors' supervision. The latter guarantees the good unfolding of the remote collaborative learning process within the subgroups of students. When the tutors support their groups from a distance, they encounter particular difficulties. To prepare them for this, a preliminary tutors' training is organized each year. One of the activities suggested consists in debating cases or "problem situations" encountered in the tutors' practice during the different project phases. These cases are debated face to face on the different university sites and shared remotely through a video-conference system. However, the discussion can also go on from a distance, either about cases which have not been dealt with yet, or in depth about the cases already tackled, or to imagine new ones.

The tutors' community has already used the CoPe_it! service for this. So the tutors have expressed their difficulties in the workspaces in the form of an analysis of cases. On several occasions, they have denounced the problems encountered in the group where they were tutors. The other CoP members have then given their opinion arguing and sharing their practice. At the end of the discussions, they have tried to find collectively solutions and hints to solve the problems. Several collaboration attempts have been undertaken with CoPe_it!, few of which have really succeeded. In the currently used version, as in its current version, CoPe_it! has difficulties to lead the users to a productive work of collective argumentation. The slowness of the service remains a major obstacle. This malfunctioning is also understandable because it is difficult to understand a debate in progress, the global reading of the debate remaining difficult (you have to open the messages one by one to read them). The opinions are not always clear-cut. So it is difficult to classify them. Choosing the objects (note, comment, idea) to translate an intervention is not always easy. The ways to do differ from one person to the other, the structuring on a white board is not the favourite mode of expression for everybody. In the present state of affairs, we think that the CoPe_it! interface is not intuitive enough and that its use requires a training course. This course as well as some ergonomic improvements could perhaps compensate for most of these problems.

User 2: collecting documents serving as a basis for a debate

Within the context of building a curriculum for the class "Benefits of the media and of the ICT in education" given to student teachers (teachers in primary schools and the first cycles of the secondary schools), we were four researchers who had to confer with one another about the relevancy of the different bibliographical resources. These resources had to feed the reflection about the gain from the use of ICT in training. We have decided to use CoPe_it! to share our resources and give an opinion about the documents placed in a collaborative workspace that we named "analysis of the literature". At

the beginning, the resources were organized in zones listing various components: document to upload (or its reference) with a header from which some links were created towards headings providing some comments. We quickly realized that, even if we had a common objective, the structuring of the information was rather personal: meaning given to the icons and to the contents associated with them, organization of the conceptual zone, kind of headers given, and so on, which made a structured reading and an exploitation of this information difficult. The use of the different icons available was discussed lively in order to associate the same meaning to it, which was not evident: the "notepad" symbolizing a note was associated with quotations, the "light bulb" symbolizing an idea, the description of the usefulness of a document in relation to the matter dealt with, the "comment" with a short summary relating to the document analyzed. It is true that the conventions we have adopted are clearly outside the service that offers generic icons but the semantics of which is too vague and difficult to interpret in a given context. So after experimenting an "analysis of the literature" space, we have created another one that we named "organization of the resources". Indeed, the restructuring of already available data proved to be not easy, the manipulations related to moving the objects, changing the headers, and so on, being tedious. In the new space, the idea was to use these resources and comments with the possibility to read them either in a linear way (document, summary, usefulness, quotations), or transversely (for instance, the global view of all the summaries) and to spot anything that could enable us to structure the result of this analysis of the literature, knowing that at a given moment, it would probably be even more useful to create new spaces linked to the sub-problem or angle of clearance of the starting problem (for instance results of quantitative analysis or kinds of variables tackled). However, neither the graphical visualization, nor the visualization structured in the "details" window or in the "forums" view enabled us to exploit efficiently the information present in the workspace in the goal the team had set itself. Moreover, adding links related to other persons' opinion proved to be unthinkable because it was impossible to manage once the quantity of documents increased. Other problems discouraged our small team of researchers from using CoPe_it!:

- the slow loading of the objects in a workspace;
- the difficulty in managing the elements placed in the conceptual zones;
- the display of the data (sometimes outside the screen),
- a lot of other small problems.

We remain on the lookout for new versions because we think that outside these interface problems, the task the service intends to support is interesting.

2.5 eLogbook

2.5.1 What the developers tell us about it...

Between logbook and (virtual) desktop

The name "eLogbook" itself literally suggests an electronic diary (log book). Its motto, "Collaborate, share and be aware" is clear: its aim is to enable several persons to collaborate with the help of shared documents, while enabling each user to keep constantly informed of the development of the project(s) he/she takes part in. Developed by the Federal Polytechnic School of Lausanne (EPFL), this Web service can indeed be seen as a log book, in the sense that it keeps a contextual trace/sign of a certain number of events. However, the "shared desktop" metaphor will probably give the user a precise idea of what it makes possible. Within eLogbook, the collaboration happens through the "sharing of the bringing-in/benefit in joint work projects.". It takes place in workspaces. One of the strong points in the service resides in the warning mechanisms (awareness) or the in real time awareness of the work carried out by the other members of the project that it implements at several levels.

eLogbook is not directly a writing team with several hands, as a wiki or a collaborative word processor could be, even if makes it possible through the production of deliverables (cf. hereafter). In terms of knowledge creation, the service offers sharing of resources (assets), using if necessary sharing as a basis for establishing a report (deliverable). Familiarizing oneself with eLogbook requires a few (knowledge) requirements, necessary to understand the service interface. These can be described through its fundamental entities, which you can assimilate easily with the "three a's" (figure 39): actor, activity, asset.

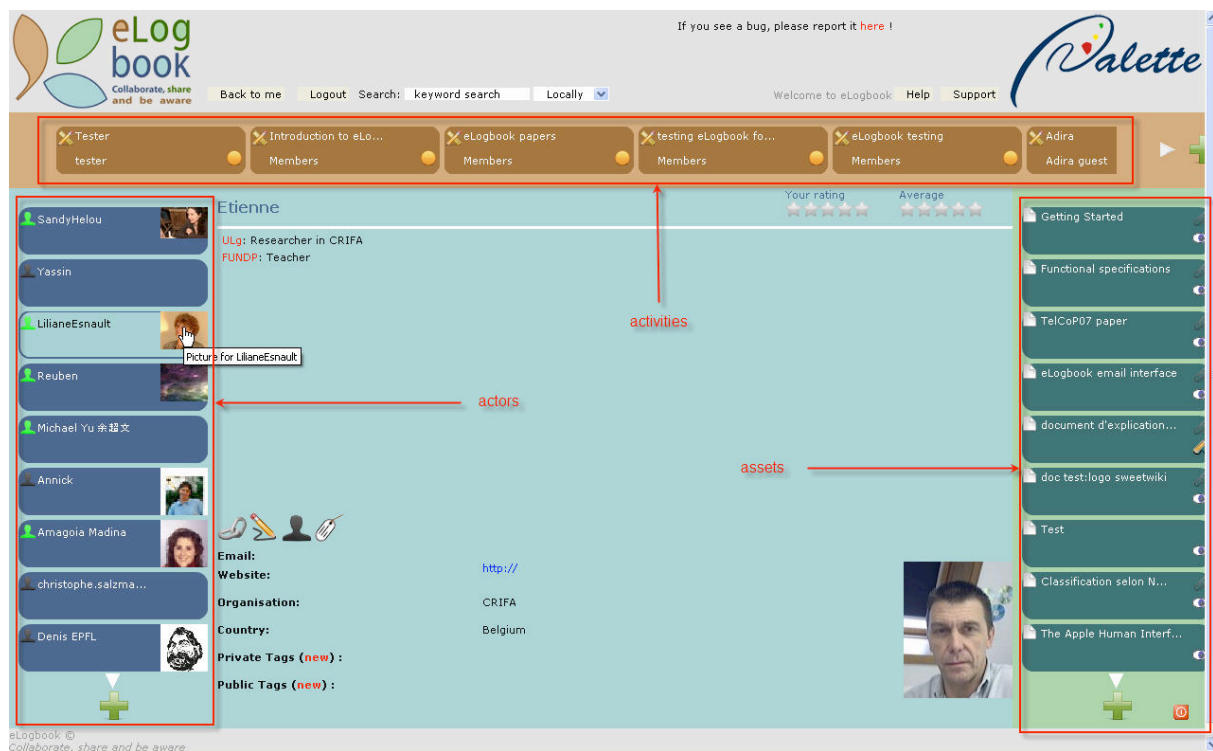


Figure 39

The three A's

Actors

In the acceptance of eLogbook, an actor is "any entity able to generate an event in the eLogbook workspaces". The choice of the word "entity" rather than "person" or "individual" is due to a wide vision of the term "actor". This notion refers to the concept of "acting" developed in the sociology of translation, and more particularly in the *Actor Network Theory* (Latour, 2005; Law & Hassard, 1999).

So, a third-party application can be considered as an actor by eLogbook, in the sense that it can send a message to the service that will be able to deal with it to transform it into a resource of the same status as the resources a human being could have brought.” However, in the reality (and at the current stage of eLogbook development), we will just consider an actor as a human being taking part, these advanced functionalities still having to be exploited. Any user registered/enrolled in the service will be considered as an actor in the following lines.

Assets

In eLogbook, an asset is *"a resource shared between the actors of a community of any kind, of any format, and of any size"*. More prosaically, it means any kind of document on a computer device (text, image, sound, video), from the most basic (a few words written in a notepad) to the most sophisticated (a presentation including rich text, image, sound and video). One step further, we can define asset a bit more globally as any user's bringing-in, of whatever (electronic nature it may be).

So, the term "resource" seems to be too rich to refer to a simple comment that could be given about another resource. Let us take the example of a PDF document, a resource, to which a user has added his/her contribution in the form of a short comment "document that is a bit too technical for the target public/audience"). In its design, eLogbook does not allow any other mode of exchange, neither synchronous ("chat", VoIP, for instance) nor asynchronous (forum, for example), but the system encourages us to use the assets system to emulate these features and thus to satisfy the needs for communication between the members of a community. That is the reason why we widen/extend the concept of an "asset" to the concept of "contribution" besides the initial concept of "resource".

Activities

An activity is defined as *"the formalization of common objectives that have to be achieved by a group of actors"*. However, the concept of activity refers to a far wider reality than the idea we could have of it intuitively.

- The activities are organized according to a hierarchy: a main activity (or "mother-activity") can host sub-activities which in turn can have their own sub-activities, and so further on (daughters, granddaughters, etc.). Creating a mother-activity comes in fact to register (create) a community in eLogbook. In other words, the main activity is the registration of the community in the service, the definition of its features as well as the determination of its members and their rights. Sub-activities are closer to the intuitive notion of an activity. They are associated with the work objects about which we share and exchange. It is within these sub-activities that we define objectives of collaboration, achieve tasks and launch events.

Let us take a concrete example: the members of the CRIFA CoP decide to share theoretical references thanks to eLogbook. The procedure will first consist in creating a mother-activity (and so, in registering the CoP in the eLogbook service). Next, within this activity, one or several sub-activities are created, within which the CRIFA members will be able to share and discuss their theoretical references. In brief, the service makes it possible to create workspaces where the actors can register CoPs, lead tasks, collaborate through the sharing of bringing-in, but also be informed of the events concerning them directly. Indeed, the service offers a set of rules enabling to establish the communication, and thus links between the three a's, actors, activities and assets. For achieving these tasks successfully, eLogbook enables for example to manage the actors' invitations for some activities, the part of each actor as well as the actors' rights to access the assets.

The main functionality of the service

As we have just seen it, eLogbook offers several great features that we are going to analyze in the following paragraphs. Among other things, eLogbook offers:

- activity or task management;
- asset repository, a system of archives where the user can place all sorts of assets;
- an events logging service;
- management of user profiles and notification preferences;
- awareness services.

Figure 40 is a graphical illustration that we will analyze in details later.

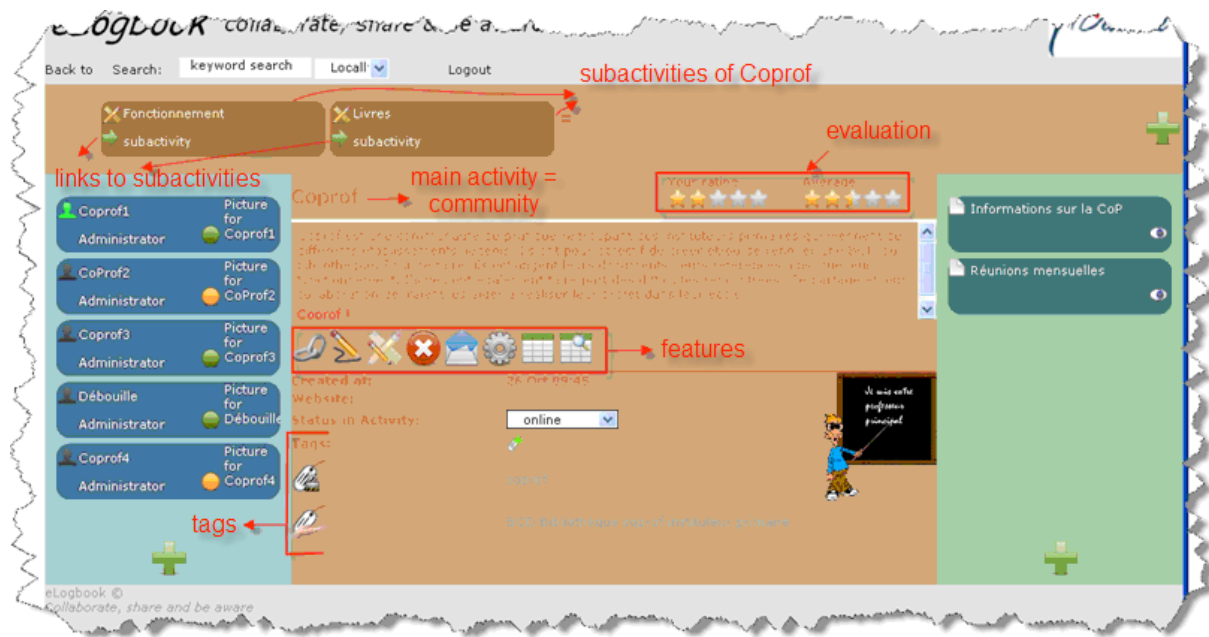


Figure 40

Activity or task management

Let us remind users that the notions of activity and community are merged when using eLogbook. If we put the reasoning further, it is possible to use the system in such a way that the sub-activities can also refer to subgroups within communities, subgroups taking part in their own sub-activities. In any case, the number of connections and the depth of the hierarchy (the number of levels it contains) are not limited. The access protocol (in reading and/or writing) to an activity and to its resources is rather complex. Each activity and sub-activity can be private, public or partially public, but also open or closed. What does it mean? At the beginning the creator of an activity is its administrator/manager. He/she is the one who takes the initiative of inviting other persons to his/her activity and who decides each person's rights. In the most extreme case he/she could decide that any invited person becomes an administrator, in which case all the persons invited could have all the rights on the activity and its resources. If the activity is private, only its creator has access to it. When it is partially public, it is on certain conditions (being a member of a particular activity, playing a particular part in an activity). Again, the administrator/manager is the person who decides. As soon as we no longer fulfil the necessary condition, we obviously lose our rights. When we are invited by an administrator to his/her activity, we can accept or refuse the invitation. As long as we have not made our mind, we do not acquire rights. So, if the activity is closed and we have not answered to the invitation, we only visualize the description and we don't have access to its resources. On the contrary, if the activity is open, we have read-only access to its resources and we could have more rights (according to the role we have been given by the administrator) when we have given a positive answer to the invitation.

The finality of a (sub)activity can perhaps be to supply raw material, in terms of assets, for producing deliverables, *i.e.* completed reports for a given deadline. Here follows an illustration of this.

A community of researchers in pedagogy wants to write a scientific article. Each of them has to choose a main line among different existing kinds of pedagogy; each member will be a co-author of the final article, which will include sections justifying the pros and the cons of the functional pedagogy, the pedagogy through a project, the institutional pedagogy, and so on. The collective assets collected while the service was used will be used as a basis for this document written by several persons. As eLogbook enables to allocate different roles to the community members and to give personalized rights of access (sub)activities, the researcher called Serge will be responsible for an "institutional pedagogy" sub-activity, while he will be a reader in the "pedagogy through the project" sub-activity. According to the role given, (here respectively responsible and reader), he will be allowed to perform different actions

in the activity. As responsible for the "institutional pedagogy" sub-activity, Serge will be able to place assets there and to change the content, whereas his role as a reader will restrict him to consulting and reading the content in the "pedagogy through the project" workspace.

Finally, with the help of eLogbook, the educationalists CoP will be able to choose the kind of pedagogy to advise according to the evaluation obtained or to work again on the content of the sub-activity, if the evaluation of the activity quality proves to be bad.

Asset repository

For each activity or sub-activity, eLogbook creates a collaborative space in which the resources/assets can be placed. It is possible to consult them and to upload them. It is in this frame that the collaboration concept within eLogbook is implemented: it is possible to exchange and share resources and practices (see above the parallel between the *assets* and the raw material).

Access rights can be given to these resources, on three levels: the activity, the role (in an activity) or the person. In practice, we can access a resource on one of the following conditions:

- if we have a specific role in an activity giving us a right to access a resource;
- if we are a member of an activity enabling us to inherit rights to a resource;
- if we have got a direct access to a resource given by the personal action of a person responsible for the (sub)activity.

As in the case of activities, it is possible for us to tag the resources/assets we can access. Its owner can choose to make them private or public – to the whole community or only for some groups. Moreover, it is possible to establish links between resources and activities, and to specify the type of link that is most appropriate. So, for example, an asset can succeed to another one, be an answer to another one...

Events logging

Each action carried out in eLogbook is registered not only in a chronological order, but also in a contextual way. In other words, each action is recognized (recorded) in the context in which it took place (who, in which activity, what...). This feature is used above all by automatic information services in order to keep track of the events taking place in the community. To make sure that the system will not soon become intrusive, we are kept informed of actions and events concerning the activities we are involved in.

Management of user profile and notification preferences

Within the service, we have an individual space at our disposal, where we can create and modify our personal profile and our notification preferences. Our personal profile gives information about our address, telephone number, email address as well as our practice level and our main interests. The notification preferences indicate the terms according to which we want to have information and get awareness.

Awareness services

The automated eLogbook awareness services give three kinds of automatic information:

- awareness based on the asset: this kind of information consists in warning us about all the actions related to the resources exchanged in the community and in the groups we belong to. These notifications are about the creation of new assets as well as about their evaluation and submission.
- awareness based on the activity: this kind of information reminds us of our involvement in the activity as a deadline draws near (rough draft, finalized document).
- awareness based on the actor: this last kind of information informs us in real time of the presence on the service of the other members involved in the activities or sub-activities (via the following indicators: "connected", "busy", "absent") and warns us about the arrival of new members.

2.5.2 What the learning specialist tells us about it...

An example: the renovation of libraries

On the occasion of a debate organized about the renovation of libraries, personnel members (teachers, directors, librarians) make the decision to renovate together the libraries in their respective schools. To do so, they want to share their resources and find together basic principles behind this kind of project. They set themselves up as a community to which they give the name "Coprof".

eLogbook enables one of the community directors to create an activity entitled "Coprof". The creation of this mother-activity makes the existence of the virtual community a reality within eLogbook. In the sub-activities, we obviously find a sub-activity called "renovation of a library" within which the director in charge of this mission is going to define the objectives of the collaboration and the tasks to be completed. As the renovation of a library has several constituents, he takes the initiative in creating four sub-activities too: "Material", "Functioning/management", "Books" and "Decoration". As he is the creator of the activities and sub-activities, the director becomes the administrator of it.

As he is about to create his community, eLogbook leads the director to invite the different Coprof members by mail to come into the service and take part in the activities. In the allocation of the roles, the director also gives the role of administrator to other persons who will be responsible for the four sub-activities. He also gives the roles of "members" or "reader" to other directors, teachers and librarians. So, several members are involved in several activities, while having a different role and different responsibilities (access rights). For instance, François, a teacher, is the administrator of the "Material" activity, which offers him many actions such as modifying the workspace, submitting an asset, changing the roles of the members... On the other hand, he has the role of a member in the heading "Books" where he just can give his opinion. In the heading "Functioning/management", François is a "reader", he can only access information and reads the content of the resources. As for the librarian Marie, she is administrator in "Books", a reader in "Decoration" and a member in "Functioning/management". All CoP members take part in the "Renovation of the library" activity, but each member is not present in each sub-activity. In other words, they divide among the sub-activities according to their main interest and their concerns.

For each sub-activity created, the teachers, the directors and the librarians who have the required rights, write a short description by explaining the content of the exchanges and specifying the objective pursued in sharing resources. For example, the "Books" sub-activity consists in leaving titles of interesting books for the different age brackets of primary school children. For each asset left, the teachers and librarians describe the books and explain why they are interesting and how they can be the subject of educational activities. They also add the picture of the book or the text or the image of a significant extract. Some even create links to the shop sites where the books can be bought and at what price.

At the time of each contribution, the other Coprof members receive a mail warning them of the changes and of the development of the collaborative workspaces according to the preferences they have notified in their profile. So, for example, a teacher is warned of the fact that a librarian has found an additional book about death or that he/she has found the book in another shop at a lower price.

For each book added through the creation of an asset, the CoP members tag this asset. For example, by exchanging in the workspaces via the addition of assets they have come to an agreement on three criteria: the age bracket (e.g. 8-10 years), the genre (novel, documentation...) and the theme/topic (eg: death) of the book. So, when a Coprof member decides to find again more directly the book he/she wants or to find a book on a given theme, he/she looks for it thanks to the tagging search module of eLogbook.

After these exchanges and this sharing of assets, Coprof decides to write a report. The report goes over the principles and rules applied during the renovation of the libraries. It is also used as a support by the directors and the teachers to write the school project for at least three years as well as the annual progress reports on the project. Some time before the deadline, the members receive an email to remind them of the deadline for the report. Moreover, they are kept informed of what the other members have added within this report as it is being written.

Reflections

Several benefits from using eLogbook...

Flexibility of space and time

First of all, the fact that it is accessible via the Web can enable us to get connected from anywhere and from any computer with an Internet connection. This easy access is a non-negligible advantage in the case of communities where the members are scattered and/or have difficulties in finding opportunities to exchange simultaneously. So, to come back to the example above, François, a teacher spends twenty minutes of his spare time on Tuesdays using eLogbook on one of the computers in the school while Mary, a librarian, takes advantage of her children being in bed to add an asset from home. Both would probably have encountered difficulties in fixing a common moment in their calendars to exchange this information. Thus eLogbook meets somehow the need for flexibility of space and time that is more and more expressed in the training world (Denis & Leclercq, 1994).

Tags

Next, we can have benefits from the tags (sorts of label-words) to tag assets, among other things (actors, activities and sub-activities, deliverables). Tagging enables us to search easily for our personal assets as well as the activities we are interested in. To ensure coherence within the community and for an efficient use of this feature, we advise to discuss and select jointly collective criteria for the creation of new tags. Indeed, if we use our own tags, we risk not letting the others benefit from our resources with regard to the personal logics and reasoning bound to the use of tags.

Granularity of roles and access rights

The service also enables us to obtain a granularity in roles/parts and access rights, which represents some flexibility of use. Allocating roles also favours enrolment (Henri, F. & Lundgren-Cayrol, K., 2001) which is required by collaborative work. So, we have a specific role at our disposal, listing/including particular skills and tasks. By performing our role, we let the others benefit from our work, and at the same time, we enable the community to progress, to develop. This allocation of the tasks can lead to mutual learning and mutual interest at the sight of each member's features. Nevertheless, according to the kind of use in the CoP, this flexibility and the complexity level bound to these access rights can result in the opposite effect. We keep some reservations as far as this variety of defining the parameters is concerned.

Shared objectives

When we create sub-activities, we can write a description of it. This possibility leads us to think of shared objectives and obliges us to define common work objects related to the collaboration, which will make us work in the same direction. However, we have to make sure that the administrator (or the creator of the community and the sub-activities) precisely rephrases the objectives pursued by the community and does not change this description into personal aims. The exchanges should concern common interests where collective and personal values are expressed and negotiated for each of us (Amblard, H., Bernoux, P., Herreros, G., Livian, Y.-P., 2005; Callon, M., 1986). Without this process of co-construction and of social negotiation, the chances for this collaborative work to succeed dwindle within the community.

Shared directory of practices

In the perspective of continuing education, eLogbook offers us a place where we can exchange different assets (documents images/audio/text, tools, concrete practices, reflections, theoretical references, links, advice...) So, we can build a repertoire of practices that is varied and shared by the community (Lave et Wenger, 1991), which can have several influences in terms of learning. Indeed, having knowledge of other experiences leads us to enrich our own practices and widen our personal repertoire. Being aware of the methods that others have implemented, we can have a new look at our own practices and make them develop. Verbalizing and posting/placing assets can lead us to think about their relevancy, because the latter are submitted to other people's opinion. Besides, this repertoire can become a precious help because we can draw something from it according to our needs. These are the reasons why the use of eLogbook can be formative. But, to do so, some conditions have

to be preserved. Indeed, we have to make sure that our exchanges are linked to a collaborative work. Otherwise we risk exchanging a few assets and not going further. Adding assets has to lead to an achievement to be used by community members. Of course, the awareness service informs us of the development in the workspace, *i.e.* when other people add information and change resources. But, in contrast to the deliverables, the service does not mention the time elapsed since our last interventions. Thus, if the exchanges are not an end in themselves, they will probably decrease and finally disappear in the long term.

Therefore, as usual in project management, we suggest that the community should also fix a deadline concerning the exchange period. As for the added resources, we do not know the author/creator's name. However, as mentioned above, it may sometimes be useful to have this information at our disposal. That is the reason why we advise users to associate their initials with the asset or to add a heading "Co-author(s)" in the description where every member can leave a sign of his/her action.

Communication related to collaboration

Apart from the assets, eLogbook does not offer any place where we can communicate with one another in the workspaces about more practical or minor/secondary information. With "more practical or minor information", we mean information helping the community to carry out some intermediate tasks, or to react according to the interventions in the workspaces. Actually, in a sub-activity, we can discover several kinds of assets (types of interactions): some consist in asking more information about a misunderstanding while others are the exchange of a document or the role we want to play when the tasks are being allocated. This is the reason why we sometimes speak of asset (instead of resource). But mixing assets of all sorts inside a single space can generate a series of very mixed resources. The exchanges seem to be necessary to make collaborative workspaces progress. That is why we advise people to create workspaces that are specifically to this communication and to make sure that the exchanges should be of the same nature, as often as possible. In other words, we think it is preferable to have several sub-activities at our disposal, each of which having its specificities, rather than a single sub-activity where the assets are mixed. As an illustration, we could find a sub-activity again, only including the allocation of tasks, another one with the reactions to the other persons' assets.

Collaborative production: the deliverables

As far as the deliverables are concerned, we can write them collectively. Indeed, we have the possibility to share out snatches of documents, which enables different persons to work together, to stimulate their cooperation and their collaboration so as to achieve a common objective. Of course, this collaborative production can lead to documents of a better quality and more detailed thanks to debating, combining and structuring heterogeneous ideas. But this work also requires many cultural changes. These ones require changes in the practices and a period for adaptation (cf. section 2.2.2).

Automatic information services

Last but not least... The real advantage in using eLogbook is found in its automatic information services. It gives us crucial information (personalized and sensitive?) within the collaborative workspaces through an automatic information system. That system mails information and facts about the recent publications, about changes that have been carried out or about the deadlines, in the case of deliverables. This feature enables users to follow-up of the evolutions and the development of a particular subject, or to keep informed about a specific field of interest. The user leaves the system in charge of this unrewarding task. Moreover, tracing develops consciousness raising and reflexivity by supplying some sort of feedback through the emails sent. In return, this information leads us to a thinking attitude and a realization by comparing unconsciously our actions with other members' actions, and vice versa. They force us to wonder about what we want to achieve, what we have managed to carry out, what is left to be finished... Beyond time saving, these features enable us to make our participation regular and our activities more complex. The qualities of eLogbook are even more important within the framework of collaborative work from a distance. Indeed, according to the number of participants, the number of assets (which can be so many solicitations: demands for precision, questions...) can be numerous. Consequently, in the absence of an automatic warning system, the risk of forgetting the topic or the subject of the request increases.

2.5.3 The interface as seen by a user

eLogbook is announced as a tool for collaboration, sharing and awareness. It's a service which aims at being used as a virtual office in a collaborative environment. The main advantage of the service lies in the awareness services enabling to support the collaboration and coordination between the members of a community. This service informs the members of the novelties associated with the community(ies) they belong to.

eLogbook enables a great flexibility in the sense that the users can personalize their user profile and define their preferences. However, as we'll see hereafter, the procedures are not always very intuitive. How can we use the roles, the privileges...? How can we build private or public communities? How have we got to allocate the roles? The procedures do not appear explicitly. Before going straight to the point, let us put forward that it is delicate to produce a document recapitulating the difficulties encountered because eLogbook is continuously evolving/developing. The interface has already developed a lot and positively. So the comments expressed concern the interface that was available at the moment when this report was being written (December 2007 - January 2008). This is also true for other tools, but more important for eLogbook.

Most common goals

According to what is written above, we have chosen to analyze the interactions via the interface for the following goals:

- entering the service,
- making the most of the information placed in the service,
- being kept informed of the novelties (awareness),
- taking part in a workspace.

Before starting the analysis of the goals, let us put forward that as far as usability is concerned, a first difficulty for us as French-speaking users, is to work in an interface in English. At the current stage of the development, we do not have the possibility to choose the interface language. This difficulty was submitted to the developers and we hope that in later versions it will be possible to choose the language in the interface. Let us go over the goals one by one.

Entering the service

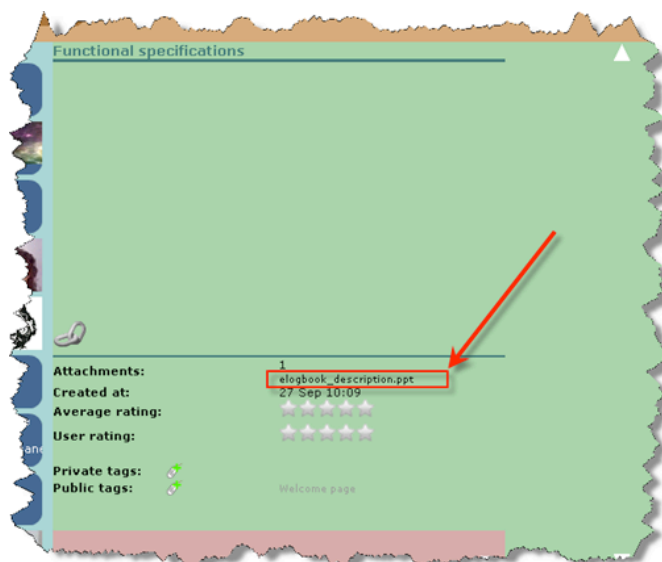


Figure 41

We can see that on the homepage all the activities appear, as well as all the assets and all the users. A newcomer in the service finds difficulty in understanding the logic of the codes defining the different zones. When we get connected to the service, the homepage is generic and when you identify, the homepage gives our profile. In addition to this, we get little help for the interface elements: the links in the assets are not always clearly visible (see for instance figure 41 and the attachment), some icons redundant and/or numerous, the presentation troubling (little compatible with other software). Moreover, the presence of interaction elements that are a priori useless overburden our decoding of

the interface, as well as the fact that all the information does not appear on one single screen, which obliges us to use the vertical and horizontal scroll bars.

For an easy entrance in the service, it is strongly advisable to consult the aid document summing up the explanations for starting eLogbook (figure 42).



Figure 42

Making the most of the information placed in the service

All the resources, all the actors are mixed: it's when you select that you can see the links between actors and resources (contextualization). If we have to find quickly a resource, it's preferable to have recourse to a search module with keywords and, even better, with tags. At the moment, this module is not really operational yet and the allocation of tags remains a problem in terms of constancy and stability. The display of the online users seems to be little useful for the moment. Indeed, it's impossible for us to contact them directly by chat. Moreover, it seems that a session is never closed by the server and many users do not think to get disconnected. Thus the "online" users are not necessarily "online".

Being kept informed of the novelties

An interesting advantage of the service is the automated warning process (awareness) resulting in the sending of emails. However, these are too many of them (continuous sending as soon as an asset has been carried out) and the links each of them contains could be brought together in one single sending concerning a particular (sub)activity after a lapse of time determined by the user (e.g. one hour, one day,...).

Taking part in a workspace

In general, we think that the functions such as the adding of activities, actors, assets and deliverables are positioned too near the screen edges, in zones that are too little accessible from an ergonomic point of view. On the other hand, the functionalities enabling to modify the activity are in a prominent place in an easily readable zone (in the middle of the screen). By taking part in a workspace, we'll go through the following sub-goals:

- creating a new activity : the concept of activity seems a bit ambiguous to us. Indeed, behind the creation of a new main activity hides actually the creation of a new community within eLogbook. On the other hand, the sub-activities are associated to the work objects for which we share and exchange. So there is some confusion for the choice of vocabulary in the interface.
- creating a new asset : in a sub-activity, we can discover several kinds of resources: for instance, it can be additional information destined to dispel a misunderstanding, exchanges of documents, or resources mentioning the role we want to play when the tasks are allocated. That is the reason why we speak of "asset" and not of "resources". But mixing assets of different nature in a same space can quickly prove to be unreadable. In order to overcome this difficulty, we advise to create workspaces specifically destined to such or such exchanges: in other words, we think it's preferable to have several sub-activities, each of them having its own kinds of assets.
- giving access rights as administrator: as administrator, our tasks grows complicated
- writing a deliverable: the main difficulty comes from the allocation of roles (submitor vs validator), an obligation that a priori we do not systematically need and that complicates our tasks.

Recommendations

As put forward in the introduction, the comments do not take all the richness of the service into account because it has not been possible to comprehend it completely as it's continuously developing. That's the reason why it's a bit vain to give advice at this stage of the development.

In general, we can say that the use of eLogbook requires a period of adaptation, partly because of its configuration and the very many possibilities of the tool (see for instance the richness of the defining). We have to take time to get a good comprehension of its mode of functioning... time that we are not ready to invest! And yet this project promises to be interesting and should encourage us to tackle it in depth so as to seize all its shrewdness. At the current stage of the development, we also have to forget a sometimes inadequate display of the information (for example, superimposing of elements affecting the readability) that should not continue.

The improvements that have been planned in the short term are towards a more intuitive and simple service, so as to reduce the time necessary to get familiar with it and to learn using it. Discussions have started with the developers, and things progress...!

2.5.4 Experiences

User 1: my view of eLogbook

I have not been able yet to use eLogbook in a real situation, but I have somewhat examined it. I can see it as a service simulating a virtual office enabling me to share documents with other members of my community, to add some comments to them and modify them if necessary. The software regularly develops from an ergonomic point of view thanks to the users' advice. For the moment, it still suffers from some complexity because of the environment it simulates and that sometimes seems to be destined to the writing of scientific articles.

Fortunately, this complexity does not affect all the users of the service: only the community member in charge of the management of a project has to devote time to getting familiar with some concepts. By project, I mean the possibility to create activities, sub-activities and/or deliverables. I find the writing of deliverables particularly interesting because its work environment is undoubtedly practical for the collaborative writing of scientific works or editorial works with a large scope.

There also the administrator has to define some roles (examples: submitters, validators) and specify deadlines. But defining deliverables is nevertheless a bit too rigid to meet simpler needs. As for the ordinary user, he/she can contribute more easily to the deliverable, and does not have to define all the elements. Generally, eLogbook can besides unsettle him/her as it is sometimes still rough draft.

The most important gain from the service is its notification system by electronic mail (awareness). So, all members of a group or those of a subgroup concerned by a topic are warned by mail of the new documents and comments left on the virtual office. Whereas other systems demand an action from the user (in this case, getting connected to the service and checking that nothing new has happened since their last visit), eLogbook enables the user to be aware and informed without doing anything. The system is in charge of informing about any activity likely to be interesting. If we admit that electronic mail is often read by most Internet users, we can easily imagine the catalytic role of such a system. Another interesting gain is the possibility to tag documents and comments, so as to find them again easily. I find this useful for a project of a certain scope over a long period of time. So the service couples, in a harmonious but still perfectible way, what would be the equivalent of a file server and a forum system: to the first, it gives the possibility to add comments and give an evaluation to the shared files, whereas it gives the second a way to manage attached files, which makes it possible to have discussions based on the documents.

User 2: a community vs. an activity

I wonder if eLogbook is directly dedicated to the CoPs. I have understood that eLogbook associates an activity to a group of people, thus that it can associate an activity to a community. If I want to simulate a space reserved for my community, I just have to create an activity, to define who takes part in it and

the roles of each person. This macro-activity then represents my community and if I have the rights to do so, I can define all the sub-activities I want, like all the other members who have these rights.

The "activity" concept is rather vague. An activity requires resources and it is a good point that I can associate the resources with the activities and define on my own, by tagging, the way I want to find them again. Thinking of my activities in terms of the persons taking part in it, of the roles they play, and of the resources they and I need, is an original and pleasant mode of working. eLogbook still has to progress in the design of the interface, but it seems to be a promising service.

2.6 BayFac

2.6.1 What the developer tells us about it

A service trying to be intelligent

At the current stage of its development, BayFac is a service for classifying documents. Its name comes from the fact that it is based on a bayesian model of "facetization". What does that mean? The bayesian model gets its name from an English statistician named Thomas Bayes (1702-1761). Bayes' theorem is used in statistic inference to update or actualize estimations of a probability or of any parameter. Roughly, Bayes was interested in the calculation of the probability that an event will happen, if we know that another event has taken place. For example, what is the probability to obtain "heads" three times in a row when we toss five times a coin, if we know that the first throw has already given "heads"? The example is simple, but it shows that the knowledge of the fulfilment of some events can give indications about what may happen later. Another widespread use of the bayesian theory takes place in the software for electronic mail. The anti-spam filters, enabling to clean up a mailbox automatically from undesirable advertising mail and daily mail – and this is done with a very high success rate, are based on this technique of statistic intelligence. If some text parts often appear in such messages and not in the legitimate messages, it is sensible to think that an email containing one of these text parts is a spam. In the universe of the CoPs, it is not rare to notice the existence of a quantity of documents of various formats, which it is sometimes difficult to find again. The idea of the bayesian model applied to this observation is to put forward the hypothesis that **if a great number of documents can be classified by human beings, the system is able to analyze the human approach and model this work of classification, so as to be able to do it without any human intervention**. For example, the system will find that this document deals with theme X (one of the possible features), because it found simultaneously such and such word, and that statistically speaking, among the documents characterized, a strong proportion of those in which these words are present simultaneously, deal with theme X. Of course, you can take an interest in other features than the theme, such as the author, the kind of document (article, instructions for use, form, and so on), the format (PDF file, HTML document, etc.) or others. Of course, if you only take statistics as a basis, the system may supply an irrelevant characterization ("false positive"). The idea is that the system is in charge of the major part of the work, just leaving the user a role of controller *a posteriori* – in the same way, most anti-spam systems do not delete the messages considered as undesirable, but places them in a special file for a fixed-term during which the user can check that no relevant mail was put there by mistake.

The bayesian mathematics can thus prove to be useful for classifying information of any type, and particularly classifying documents. There are different ways to label documents (volume, theme, author, type, etc). We will say that it is possible to analyze them from different points of view. To each point of view, a value is given. For example, the format facet will have the "PDF" value, the "type" facet the "form" value, and so on.

Within the BayFac service, an algorithm enables to calculate the frequency of some words and evaluate, according to the result, what the features of the document (values to give to the different facets) are. Of course, the principle becomes interesting when the labelling carried out by the system only requires a minimized human intervention in the form of corrections.

An interface for classification and search

The BayFac interface is oriented towards the classification by facets. Firstly, the user has to define by hand the values of the facets that will enable other users to characterize the document. Secondly, the software determines these values in a semi-automatic way. It offers the values of the different facets and the user makes the final choice. The principle is that in the end, the values proposed are as good as possible.

Parallel to the classification system, BayFac offers a search interface through which the user determines the values of the facets according to which he/she wants the search to take place.

2.6.2 What the learning specialist tells us about it...

One example: the "Historicop" community

The "Historicop" community is a community of practice made up of historians. Its members come from five French-speaking countries (Belgium, France, Switzerland, Canada and Congo) and they have gathered in a community to meet some needs in this field.

History is a science requiring a continuous reappraisal, above all these days when a great many of discoveries (archaeological, scientific) are carried out. Historians have to renew their reflections and new information has to be dealt with. The "Historicop" community appears in this approach of exploration and refinement of the knowledge of historical facts. Its members aim at looking critically at a series of events and historical decisions.

In history, there are still many subjects/topics to discuss. This community searches in a rigorous and scientific way, on the basis of many documents. So these historians need to compile many sources before starting a new analysis of a historical fact. The bibliographical work is considered to be essential reading. In this prospect, the community has collected a great amount of index cards, documents, articles, reports, on various subjects. Moreover, as in many other fields, the work of a historian has changed since the development of the Internet. There has been a popularization and a overall expansion of the sources and documents available. The community made its aim to bring together in a single place a series of documents and relevant sources so as sort the collected information. To do so, the community needed a tool that would enable it to find quickly information on a certain topic. The members decided to use software for the classification of documents and they opted for the BayFac service. Following this choice, the work has been realised in different phases.

Defining an ontology that is specific to the field

Firstly, they focussed on the definition of an ontology specific to their own practice field. Seeing the number of topics and concepts to deal with, the community had to define a series of key-concepts of the field and the possible links between them. Let us take the example of the dating of objects discovered in different places on earth and of the persons who carried out these discoveries. It is in the ontology of the community that the members decided, among other things, to define the concepts of continent, date, author, kind of discovery. They determined a series of subclasses linked to these concepts (eg. Continent => America, Europe, etc.), which often led to a debate (e.g. Do we choose the model with five, six or seven continents?). This identification and this organization of the concepts are useful for the following stage the aim of which is to determine the search facets and give values to them. If a search for documents through BayFac has to be relevant and efficient, the ontology has to be defined rigorously. However, it will be able to develop thanks to an effective use by the CoP members.

Defining facets

Secondly, the community got down to defining a series of facets and values for them, in order to carry out a search as finely as possible. So, the documents available have been classified according to the kind (video, article...), their source of production (university, scientific magazine,...), their date of issue, the continent concerned, and so on. The number of facets and their values has first been limited so as to avoid a cognitive overload for the encoder in charge of the classification of the documents, as well as for the user consulting the resources thanks to the BayFac service.

Classification

Thirdly, a subgroup that was mandated by the community started to classify the two hundred documents among those collected and stored during the preceding reflection sessions. This classification consisted in giving each document values for the different facets considered and in describing them in a few words. Doing so, the persons tested the classification system developed. Their role was also to validate the candidate data. The classification system proving to be rather robust, they did not have to change radically the values of the facets. At the very most they added a few. They then classified another fifty documents before entrusting the bayesian engine of the BayFac service with this task.

Prolongations and automatization

Starting from the information it already has, the service has suggested a classification for the two hundred documents still to be dealt with. The subgroup in charge of the classification has checked the proposals built by the system and amended them if necessary. All documents can now be found again and consulted by all CoP members, on the one hand with the documents found while strolling for the search, and on the other hand, with the community's own productions (expert's reports, reflections, and so on). The BayFac service was able to learn how to classify the new documents, which from now on enables it to help the person(s) in charge of the classification.

Nevertheless, the community will most probably have to go on refining its ontology according to the demands for classification and taking the new subjects/topics and concepts tackled into account; Then the facets will be revised regularly so as to be adapted to the development of the matters tackled by the community. At this stage, it has a data directory that will make it possible to support the discussions around the different themes and to acquaint oneself with reflections that some colleagues have given in this connection.

Following this work, a new public has taken interest in the results of the information classification by the "Historicop" community: students in history. To complete a work, a dissertation, a thesis, the students need to find the best sources as quick as possible. An access to a database of documents approved and analyzed by experts is a very useful tool for them.

Reflections

To what extent can BayFac support the activities in a community of practice?

Shared directory and common enterprise

At least two participation levels to a CoP (Cappe, 2005; Lave et Wenger, 1991) are supported by the BayFac service: a *shared directory* and a *common enterprise*. Indeed, this service offers the CoPs a means to structure and share a common directory of resources (files, tools...). Once the problem dealt with by the Cop has been defined, its members share their own resources directory by providing various documents they consider useful and valid. It remains then to make them accessible to the whole community. Defining facets and their values is a join enterprise in which the members get involved. A negotiation is necessary to obtain the maximal consensus in this connection. If the CoP is made up of several dozens of persons, it is preferable to entrust a representative subgroup with the responsibility for this task, leaving to the others the possibility to comment on the proposals and to adapt them if necessary. This participative approach leads to a classification system that should be meaningful to as many CoPs members as possible.

Reification

BayFac is not strictly speaking a help service for the reification of knowledge (Wenger, 2005). However, the involvement of the members in the document classification process can contribute to the reification of their practices. The creation of field ontologies and the definition of the facets and their possible values is a manner to formalize practice. By thinking about the way to classify the data and by categorizing their own productions, CoPs members give shape to a certain extent to their experience. They have to reflect upon the contents they deal with and to formalize the way they search for information. However, this practice is not common. A dynamic has to be implemented for this purpose and the presence of a CoP animator, or the help of a specialist (*e.g.* ontologist) should prove to be useful in such an enterprise. What is more, it consumes time. So it is important that the actors concerned should perceive the gain from this approach.

Accessibility

BayFac has been conceived to enable the members to store easily a great amount of documents. Each member can place his/her productions there and classify them according to the classification rules negotiated and common to his/her community. As time passes, an active community can create a great number of documents of all kinds. The classification problem and the storage of these documents can soon become problematic and can slow down the completion of the work. Another problem: if the

documents are not stored, they quickly become inaccessible. A document that cannot be found is useless. Thus listing them and storing them with BayFac is a good habit to pick up.

Enrolment of new members

A new member desiring to know what has been carried out before his/her arrival in the community may be discouraged if no relevant information can be found. In general, in a CoP, members develop and the teams change. So it is sensible to think that the replacement rate of the members within the CoP is high and that there are often newcomers. So there is a risk for the community to do the same work several times, because the members have forgotten that a document already exists, or that the topic had already been dealt with. So it is important that the community could find the means to classify all these documents and a computer classification tool such as BayFac is an efficient solution. Access to the whole CoP directory should thus favour the perfect command of the concepts and the matters it deals with.

2.6.3 The interface as seen by a user

BayFac is presented as a documents classifying software which enables a group or a community to place online a whole set of documents, and to find them again easily. All features of this tool go in this direction: BayFac can help us to sort and classify our documentary heritage and in this way it enables quick and efficient exchanges of documents. In practice, when we insert one (several) document(s) in BayFac, it (they) will automatically be stored on the server and the associated search tool will enable us to find it (them) again easily.

The most important goals

The search is based on a preliminary classification of documents by facets (see section 2.6.1 for further details) but at the current stage of the development, we still do not have access to all the features: for instance, it is not possible for us to create our facets on our own, or to modify them. Two main functions within BayFac have thus been identified: classification and search. Within these two functions, we have been able to list a few more or less important problems.

The goals we have analyzed are the following ones:

- classifying documents,
- searching for a document,
- visualizing a document.

Before analyzing the different goals, let us put forward that currently there does not exist any "help" function to guide the user in BayFac. The developers rely on the intuitive side of the interface. Indeed, we have not encountered major difficulties in using it, but let us nevertheless go over the goals one by one.

Classifying documents

To classify a document, we go through several stages.

First of all, we have to add a document: this stage very simply happens by clicking on "classification" (figure 43) then on the green arrow preceding "adding a document" (figure 44).

The new window also gives us the possibility to write the name of the document and to describe it. Next, we are invited to define the facets. It is important to pay attention to the fact that in its current version, the "label" term has to be understood as "name of the document". It is also important to know that no field is presently defined as being compulsory, which may damage the quality of the search service by facets. Let us also be mindful of the fact that there still are errors/mistakes that the developers are correcting. For instance, even when we do not determine any facet for the document, the system validates the classification ("v" in the "classified" column). Besides, it is currently not possible to delete or change the content of the menus scrolling in the facets. This can be a problem: for instance, we do not have the possibility to correct the misspelled name of an author after validation.

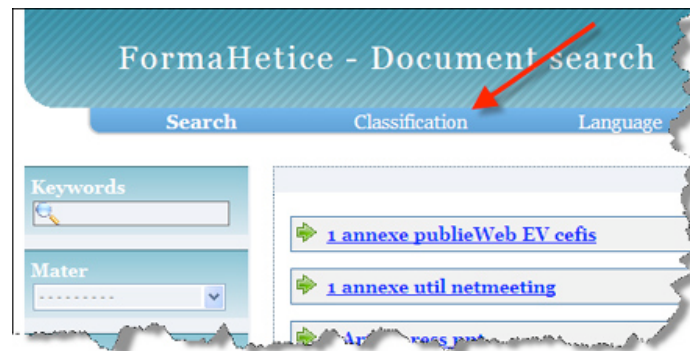


Figure 43

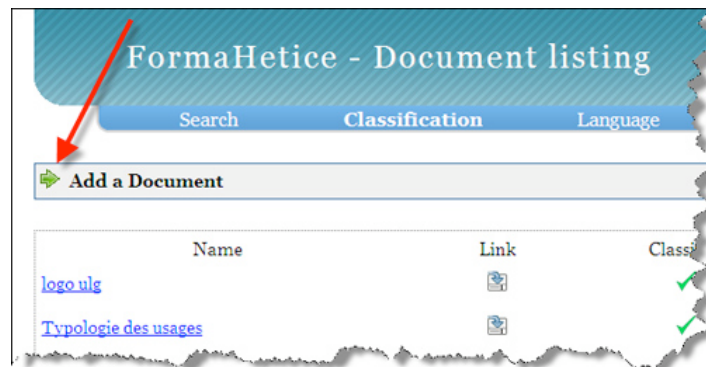


Figure 44

Searching for a document

Search by keywords is directly accessible via the left hand menu (figure 45). It is not the search function that makes the originality of the BayFac service and it is not put forward by the developers either (take a look at the search by facets hereafter) and yet, it is placed in the first position in the menu. When we use it, it proves not to be very efficient yet: in theory, the tool should also search for keywords inside the documents (and not only in the descriptions or the facets). But this functionality still needs further developments. Several tests have been carried out with different keywords and the results are not always convincing. For example, we know that the name of an author appears in at least ten documents, and during the search we have not found any.

Search by facets is directly available in the search by keywords. In figure 3, by clicking on the green arrows preceding "matter", "author", "kind of content", etc., we have the possibility to search in the facets concerned. A pull-down menu then appears (figure 46), offering us a list of choices according to the facet selected. To launch the search, we just have to click the "search" button. To date, we cannot combine several values of a same fact to carry out a search.

Visualizing a document

The display of the search results happens in the form of a list (figure 47). The description of documents is clearly presented and enables us to realize quickly that a document is interesting with regard to the element we search for. On the other hand, we do not have access to a pre-visualization of the content of the documents offered (the image preceding the description is always the same), which would sometimes help us to find even more quickly a particular document. To know more about it, the document has to be downloaded, which can prove to be a rather heavy procedure as long as we are not certain that we have found an interesting document. Downloading happens easily by clicking on the title of the document displayed in the form of a link.

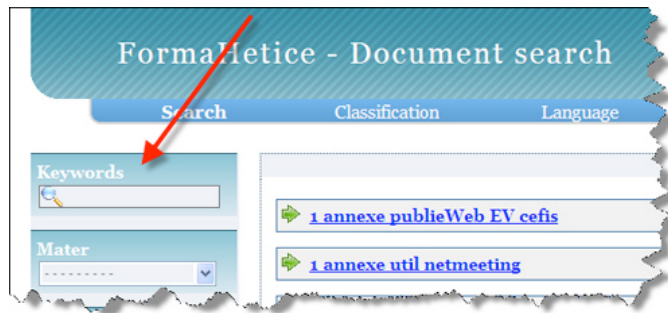


Figure 45



Figure 46

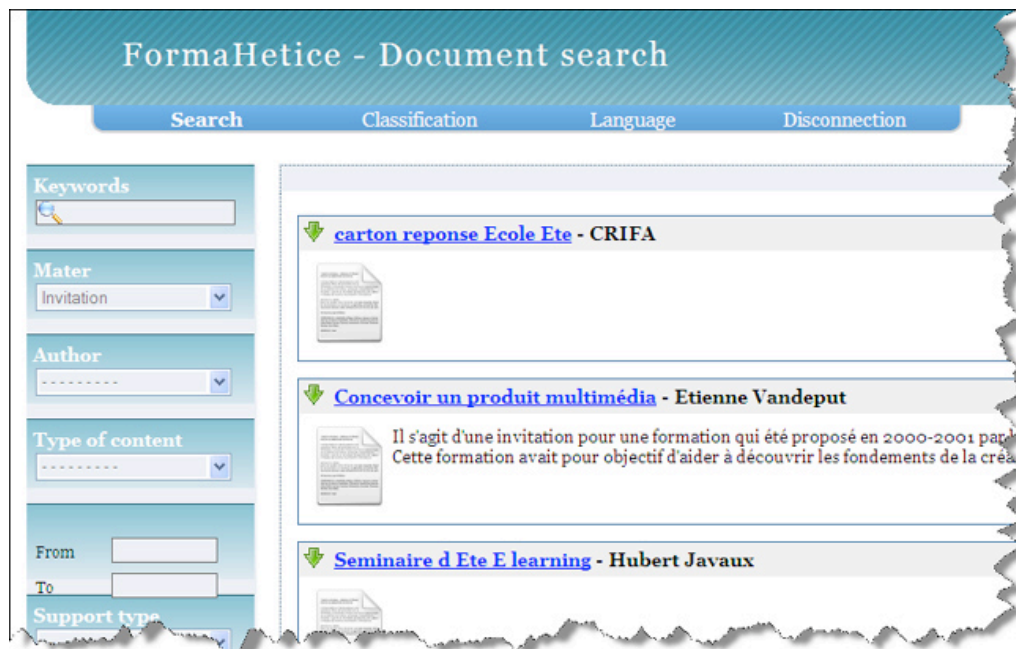


Figure 47

Recommendations

Globally, the interface of the BayFac service is relatively complete. It is fluent and easy to take in hand. The features are very clearly visible and usable. There are no useless buttons or functions. From an ergonomic point of view, very few major problems have to be reported. BayFac offers the choice of the language in the interface. At the current state of development, the French version still uses a few English words, but these inconsistencies should be corrected soon (for instance, in the Facet menu by date contains "from" and "to"; the header for the classification is "document listing". We also find "post", "edit facet", and so on).

It remains to check that the bayesian algorithm working in the background is efficient. This will only be possible with a great number of documents and a regular use of the service.

2.6.4 Experiences

The classification of resources in the FH CoP

As a member of the FH CoP – aiming at encouraging and promoting the pedagogic and critic use of the Technologies of Information and Communication for Education (TICE) in the teachers' practices in higher education, I decided with a few other members of this CoP, to use BayFac in real situation, and I've used it for six months now (at the moment this document is being written). Our community encounters a major problem: for several years, a great number of documents have been offered for downloading on an Internet site. The management of this documentary corpus has always been a problem. We have decided to test the BayFac service in order to check how easy it would be for us to find the documents from this corpus again easily. Here is a report of what has been achieved, what has succeeded, what not so much. We also report on the different stages the group has followed. Despite the fact that the use of BayFac in this community is only beginning, we can draw some lessons.

Identification of the facets

Our community has existed for several years and has accumulated more than two hundred documents that have been stored in a more or less organized way in an Internet site. The first step was to identify the facets for classifying them. The choice of these facets has been facilitated by the fact that the process was not implemented *ex nihilo*. Indeed, the existing documents had been brought together in different repositories (e.g. plenary meetings, summer school, administrative documents...). Following the advice of the service developers, the number of facets has been limited. They had to be general enough to cover the field of the whole set of resources and enable us to find them again according to the values that would be given to them. We chose the five following facets:

- author,
- type of content,
- date of document creation,
- subject matter,
- kind of support.

They seem to make it possible to find the available resources again according to habits or search needs among the members of our CoP. The choice of values we have to give to these facets has been made after discussions based on the knowledge of the existing resources and of the vocabulary used within the CoP (e.g. *Formation à Accès Permanent or FAP*).

Classification of the documents

A major disadvantage was that a great number of documents had to be transferred from one space (the Web server of the FH site) to another one (the BayFac server).

In addition, the real classification work enables to test the method and the service. So, new values have been associated with the facets and others were deleted. Classifying such a lot of documents requires much time and energy: this work is still in progress. Moreover, we can hope that once the current base will be classified and when each encoder will be used to it, and above all, when the bayesian classifier will be operational, the classification will become really less tedious.

Taking the service in hand

In general, the BayFac service is rather simple to use. The interface is functional and each stage of the process is clear. Some defects exist (cf. section 2.6.3) but they do not slow down the taking in hands nor the use of BayFac. However, an important question has not been answered: comprehending how the service learns and how we have to act to use the service in an optimal way.

A few obstacles to an informed use of the service

The user does not have any information concerning the mathematical and software processes underlying the service. How many documents are necessary to make the process of semiautomatic facetization possible? We miss a series of criteria or clear instructions, as for example the ideal number of facets or the kind of word we have to choose.

A major obstacle we encountered is that for each facet, users can provide an unlimited number of values. For example, in the "matter" facet, we already find eleven proposals (Questionnaire, PV, Free software, Internet, FAP, Invitations, Letter, FSE, ICT Methodology, PARM). This number will only increase with the number of documents and topics dealt with. However, no indication enables us to know if this number can grow endlessly or if these proposals have to be limited. Again, the service should be accompanied with rules for good practices, unless these have to be derived from the first experiences that have been carried out. We can ask the following question: "is it relevant to leave the possibility to create unlimited new facets? If there is an ideal range in which the number of facets should be, which is it?".

We have not placed and facetized enough documents yet to validate the learning process. We do not even know yet when the service will be able to model our classification work and offer us an automatic facetization we will just have to check. The general feeling after a basic use is that the software has an enormous potential for help in the classification of a great number of documents. But the gain from this software, which consists in learning through the service and a semi-automatic classification, still has to be proved in practical terms.

2.7 At a glance

In order to have an overall view of the tools and service and the tasks they are destined to, here is a table that should enable us to make a distinction between them.

A synoptic table of tools and services according to the tasks we have to achieve

X makes it possible, but with difficulty

XX makes it possible but it is not its first purpose

XXX makes it possible because it is its purpose

	Amaya	SweetWiki	LimSee3	eLogbook	CoPe_it!	BayFac
Editing of valid HTML documents	XXX	X				
Creation of presentations	X		XX			
Multimedia creation	X	X	XXX			
Publication on the Web	XXX	XX	X			
Sharing resources		XX	X	XXX	XX	XX
Discussion		X		XX	X	
Notification of the development of a project				XXX		
Classification of documents				X		XXX

3 Tools and other services

3.1 Introduction

This section deals with online services intended for the general public. We have examined them in an effort to understand how they could be useful to CoPs and their members. We have not, however, addressed certain important questions. For example, some of these services are commercial, which conflicts with the PALETTE project's free and open philosophy. The issue of intellectual property rights related to these services remains unclear. What about private data for example (some services do not offer the option to unsubscribe)? Services with obviously social purposes often have a playful side, making it difficult to determine whether they are appropriate in the work environment. This in turn raises the question about the time spent "socializing". We leave it to you the reader to give particular attention to the discussion points as you consider these issues.

Given that warning, we have seen that the tools and services of the PALETTE project do help support the activity of communities of practice. As mentioned, other services whose primary goal is not aimed at communities of practice can also be quite useful to them. Currently the Web hosts an abundance of new generation online services that facilitate collaboration and sharing among Internet users. As opposed to the Web's early days, when more or less static pages served mainly to distribute and visualize data, users can now interact directly with the Web, actively becoming involved with it as they produce, publish and comment on content. And current technological developments make this easy for anyone; no advanced technical skills are required.

These online services, most of which are offered for free, are typically specialized for a specific task. This makes them easy to use and progressively changes the way Internet users work. Instead of buying a program and investing time to learn it (such as Photoshop to edit images), it is possible to use a Web service to quickly and simply resize an image and change its format. (Of course Photoshop is not limited to this functionality, but most users often use very specialized programs to perform very simple tasks.) After editing, the image would be inserted into a collaborative document which multiple contributors would be working on over several days. In the end, it would all be published in a blog. Thanks to the Web, our relationship to programs changes; instead (some would say) we concentrate again on the activity and on the content. The issue is not really to be an expert in this or that program, but rather to understand the principles of each family of tools available on the Web, and then be able to effectively juggle different services and collaborate online.

These services are also usually open in part to other services to allow interactions between them. Take Flickr for example, a service for storing digital photos online. Flickr allows other services to use its stored photos, giving them access to its database - in a very limited manner, of course, since only certain types of access are authorized. We have seen other services use and share data among themselves, for example services that let you show photos from Flickr on a geographic map. These composite services, also known as mashups, thus combine content originating from different services. We note that these services are for the most part quite polished and perform rather well.

One of the limiting factors to intense use of these services is that it is necessary to sign up for each one, which means creating many different user accounts scattered around the Web. Remembering the various logins can be tedious. A solution that allows the interoperability of these data among the different services does not yet exist, but some initiatives are moving in that direction: OpenSocial (<http://code.google.com/apis/opensocial/>), DataPortability (<http://www.dataportability.org/>) or OpenID (<http://openid.net>). It is important to remember that most of these services are commercial products that profit from reselling the information that users provide them. It is well worth it, therefore, to find the answers to questions such as, "Am I the owner of the data that I give to such a service?", "What does the service do with my data?", etc. In the end it comes down to a personal choice, but better to make that choice in full awareness of the situation.

Based on the main functionalities that emerge from the development of generic scenarios currently in progress, here we present some services that look promising in day-to-day use as a complement to the

services described in the first section. We have separated out four major functionalities that are of interest to us:

- coordination, motivation
- participation, commitment
- management of shared resources
- communication

For each functionality, we will detail the activities concerned and propose external tools and services that seem well adapted to our needs. When possible, we will draw a connection to the tools proposed by the PALETTE project described in the previous section. This serves to show what is available on the Web and can be used in a CoP. We will finish with a table summarizing practical information to access all these services.

3.2 Coordination, Motivation

3.2.1 Which Activities?

The PALETTE tools presented in the first section address a lot of questions and activities associated with the day-to-day activities of CoPs, but do not perfectly cover the wide spectrum of CoPs needs. When using most of these tools, some questions remain unanswered: Who are the members of a CoP? How do you access the personal information of a member (email, telephone number)? When does a certain event take place? Who is present when, and where are they? Who is interested in what subject? What content do we have access to and where is it located? Yet access to information about the activities of the CoP seems essential to keep it alive and thriving. We need to move from an individual approach to a group approach.

Here are some examples of functionalities that can support this group approach:

- personal profile management and access to other members' profiles;
- shared calendar management;
- project and task management;
- group information management: announcements as well as making information available.

3.2.2 Additional tools and services

Facebook

To start with, we cannot avoid mentioning Facebook, emblematic figure (if any) of tools dedicated to creation and development of social networks. Firstly created as a directory for Harvard students, Facebook gathers today several millions users. Among the functionalities set up when you subscribe to the service, three of them are particularly interesting:

- management of groups (radically, a CoP);
- opportunity to add numerous mini-applications (notably including some of the other tools described in this document);
- opportunity to be aware on ones homepage of all what happens in a specific group (ones CoP).

With Facebook, you can create for each member of a group or CoP a Web presence, guise of a personal profile, but you can also create or join up with groups (thematic ones, for instance). It is also possible to build a list of members, and to carry out lots of relevant actions fitting to CoPs needs: to introduce oneself, to share documents, to communicate, to debate, to animate groups, to organize events, to manage a list of tasks in a collaborative way, etc.

Facebook is also a kind of 'applications collector', these applications being suggested by the numerous users of the service. Based on the notion of identity, which is essential when speaking about CoPs, Facebook covers at this moment lots of functions owing to its users and the needs of a majority of them.

The success of Facebook, indeed, is due to a large extend to the way it evolves. New mini-applications are offered every day or so. Those which are successful and are used regularly are kept, the other ones vanish.

Strong awareness features are also present. It is possible to be aware of what other people are doing.

The homepage of a user who has subscribed to Facebook looks like in figure 48.

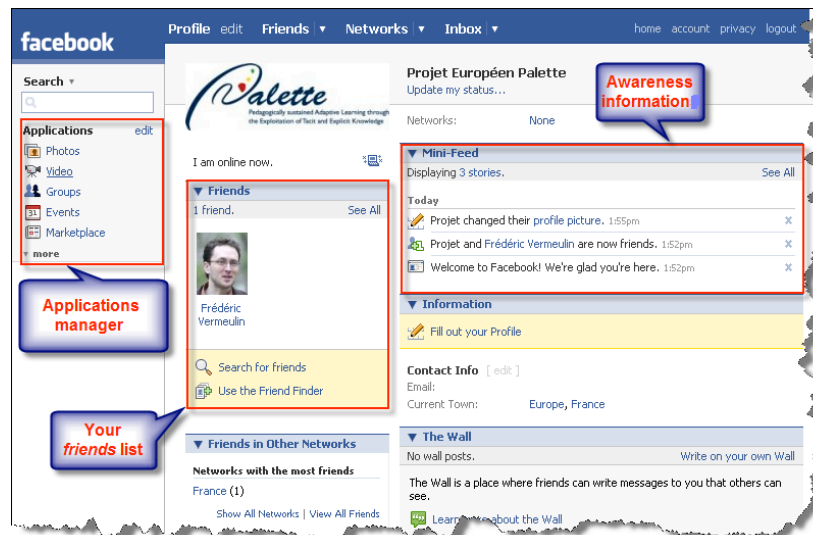


Figure 48

If we look at the service in the context of a CoP, we can imagine that its members could add or remove mini-applications depending on the CoP's specificities. There are hundreds of them, written either by Facebook, either by third-party developers. A few of them are presented in the present document. Mini-applications allow to enrich each member's profile with advanced functionalities (videos, display of the last topics of a blog, etc.).

This kind of software enrichment is beginning to develop on the Web, notably with what is referred as 'widgets', *i.e.* little visual tools allowing an external software, coming from another Web site, to be run inside Facebook. This allows for an easy and modular integration of many other services that are available on the web.

There are currently more than 10.200 applications on Facebook. This number is expanding quickly thanks to the source code availability (part of the software 'recipe' is public), which allows anybody to code his/her application and to propose it to the Facebook community. There is even a mini-application that allows users to author Facebook applications without any previous computer science knowledge! Being able to use other services inside Facebook is a major asset. Thanks to this system, users do not have to change their tools or habits, a fact that can be of great importance in the acceptability of a service.

It is very useful, in a CoP, to be constantly aware of the last events and actions regarding the other members of the CoPs. Facebook offers a real-time display of this information (provided it has been explicitly authorized by the user). These awareness services are about things as various as applications that have been installed by others, answers to questions you have asked to other members, the realization of a given task, a profile update, the creation of a new group, the addition of pictures or documents, etc.

For a CoP, the use of a social network like those that Facebook can create may prove to be very pertinent, because it allows its members to benefit from a common space that supports the creation of an identity inside a community. It then becomes possible to know who is online, who has done what and when, to retrieve common information such as events, to look at other members' profiles in order to contact them (it then behaves much like an address book), etc.

Moodle

Moodle is defined mainly as an online learning and teaching platform that supports learner communities focussed on content and pedagogical activities. Yet many educational institutions are beginning to use it for other purposes, particularly to manage research projects and collaboration or communication spaces. It is from this perspective that we tested Moodle. In our opinion this platform

can be an effective tool for a CoP since Moodle lets you integrate and organize many activities and resources, offering simple ways to present and propose elements used by a CoP (links, documents, external tools and services, etc.), collecting them all in one place. Unlike Facebook, this is not a social network but rather a space that can be managed in a collaborative way, and definitely in a more confidential context.

- The spaces created in Moodle can be used and appropriated by a CoP since they are empty by default and accept any kind of content, much like a large table where one would place any object: external documents, Web links, chats, surveys, glossaries, forums, wikis, etc. CoP members can also create and manage content directly on the platform, which makes it possible, in addition to creating Web page content directly, to integrate HTML code from other Web services, such as shared calendars, shared bookmarks, photos, etc. In this way Moodle sets itself apart from other learning platforms that have a very rigid structure, geared solely for e-learning uses. Its relatively flexible and open structure allows Moodle to be repurposed quite easily for alternative usages.
- A CoP can decide whether or not to limit access to the spaces created, and then decide who has access. One can imagine the creation of multiple spaces, some of which are confidential (restricted to the leaders of a CoP for example), and others that are open to a larger audience.
- Several roles come predefined, such as administrator, editor, and simple user, which lets you assign roles to differentiate users with permission to edit content from those who will only be allowed to read the content.
- The main forum offered by default can be used by a CoP like a mailing list, since the messages that are written there can be emailed to the CoP members. Sent messages are stored online and can be consulted at anytime by any member, not unlike common mailing lists archive systems. It is then no longer necessary to use specific mailing list services, such as Google Groups or Yahoo Groups. It is possible to create as many forums as desired to differentiate different types of discussions. In practice, we find that these forums are often used to manage common tasks, since the tasks are sent by email to group members, and the replies (or the work done to carry out the task) are archived and easily available for anyone to refer to at anytime.
- Moodle also offers a file manager that lets members upload any kind of document, either one at a time or in a compressed archive (ZIP), which can be decompressed automatically within the file manager. A CoP could thus use Moodle to collect and store documents relatively risk free, since it is possible to reverse the process at any time, that is, download all the documents to the computer, preserving the hierarchical folder structure.
- Moodle is an open system, letting you enrich the content by adding modules. Some modules are available by default, others can be added or programmed as desired. We find, for example, a module that displays the users currently online and available for a one-on-one chat, another that displays the activities done by other users since the last visit, etc. The platform's functionalities can thus be extended.
- As opposed to the other services described in this section, Moodle consists of a bundle of scripts that can be downloaded for free, but that need to be installed on a server, requiring time, money and a fair amount of technical knowledge. There does exist possibilities to use Moodle online "ready to go" offered, for instance, by Moostic (<http://moostic.ch>). Note that Moodle's user interface is still somewhat basic and even though it is possible to change the layout of each element, the overall interface remains rather rough.

Google Calendar

Google Calendar is an online Google service for managing and sharing a calendar. Although other similar solutions already exist online, Google was able to win thanks to its ease of use, since it resembles calendar management tools installed on our computers and takes into consideration the way we use them. This calendar sharing service offers a CoP a simple way of collectively managing events

associated with its activities and allows each member to follow and participate in the community's events. Let us look more closely at how this service could be used.

- After opening an account, by default each member has his/her own calendar. He/she has the possibility to create other calendars that can be viewed as overlays. A system of checkboxes allows each member to choose which calendars will be displayed. This raises the question of whether it makes sense to allow the creation and management of multiple calendars. After using them for some time, we would say that it does. This turns out to be very practical for separating one's private calendar from other kinds of calendars created for the CoP, but also from other contexts (professional, recreational, etc.). We recommend, however, that a CoP begin by creating a single calendar before deciding whether to add more.
- Calendars can show days, weeks, months or a list format.
- The person who creates a calendar can share it with his/her choice of members or simply make it public: this way it is possible to have access to and view other calendars, but also to contribute to them if the calendar owner gives the necessary access rights. The types of access rights are: modify events and manage sharing (add users and permissions); modify events; read event details; and read events in "simple" mode (the goal being to look up someone's availability).
- Each event created can be modified, commented on and one function lets you invite and manage the roles of the participants.
- Thanks to an internal search engine, one can easily find past or future events.
- A notification system allows participants to get reminders about events to come at no cost, either by email or SMS.
- Calendars can be synchronized on mobile devices, such as PDAs or mobile phones, or can be consulted on any website.
- A function allows you to get a snippet of HTML code that you can paste into the web page of your choice: on a SweetWiki page, on the site or platform being used, on social networks like Facebook, etc. Thanks to this HTML code snippet, the calendar will be displayed in this page in a seamless way.

3.3 Participation-commitment

3.3.1 Which activities?

There are many activities that may favour the participation and commitment of the members of a Community of Practice:

- discussions
- collaborative decision making
- building of a personal and collective identity

3.3.2 Additional tools and services

Poll services are often incorporated in collaborative software. Polls are questions that are submitted by a group member to other members. The community members may react through expressing their opinion or through a vote.

Facebook and its mini-applications

It is easy to integrate poll services – such as PowerPoll or Riffs – into Facebook. In a community of practice, the use of a poll service might be as follows:

- foster community life: a poll may be used as a "boundary object" in order to launch a discussion about a selected topic.
- seek advice: a poll may be used to seek advice before making a decision.
- help prepare argumentation: a poll may be used on an informal basis before building a more argued debate with tools like CoPe_it!.

The concept of "boundary object" was introduced by Star in 1989 to refer to some objects that may facilitate the dialogue or interaction between members of communities that do not share the same domain of expertise: for example researchers with different scientific background, or the users and developers of the same software product. In a participative design approach, boundary objects may facilitate the participation and involvement in the design process of actors who have either very different domains or very different perspectives on the target domain. In the case of users and designers of a computer system, this difference of perspective has been mentioned by Norman as "the gap of the conceptual models". Some boundary objects - for example a mock-up - can help focusing a discussion on some concrete aspects of design; they can also favour the use of a shared vocabulary that may be understood by the various actors.

Poll services usually provide the following features:

- creating a poll: topic, question, options for reacting. A poll may be prepared in order to allow a vote (options: yes/no/indifferent) or to allow the expression of opinions (for example with an associated MCQ);
- editing statistics about the reactions;
- voting;
- defining the span : who is allowed to react;
- defining notification events when a certain threshold has been reached (example: a majority);
- building a sub-network with members sharing the same opinion .

A poll service intended to be used within a small-size distributed community would not have the same features as one which is destined to a large Internet social network. A poll service is often targeted at expressing non-formalized opinions: expressing for example an opinion which is neither "in favour" nor "against" the question; it can accept an opinion which is inconsistent with the question. Such opinions cannot be considered as arguments. However a participating member should be allowed to

evolve his/her opinion into a real argument; this is why a poll service is considered as complementary to an argumentation service.

Considering a community of practice we can envision that a debate would be likely to start with an exchange of opinions, before shifting to a more formal and argumentative interaction, in order to make a decision or to achieve a reification of knowledge.

In the same manner the "Mindmapping" software could be probably useful to CoP members: a mind-mapping application is a program that helps user reflection through providing means to externalize the thought process. A draft for example allows for externalizing on a sheet of paper a temporary thought. The draft is used through internalization to feed an evolution of the thought process: a "reflection" – in the proper sense of this term. In other words, the construction of a thought process – or the building of an opinion – is a step process that evolves through externalization/internalization loops (Vygotsky). This implies that human thought processes depend on the tools that are available to support the externalization stage. Mind-mapping software replaces the sheet of paper by a computer screen; they accept computer representations – often graphical – that are symbolic but un-formalized. They may be used by individuals (reflection) as well as groups of people (brainstorming).

Compendium, Bubbl.us, iMindMap are mind-mapping tools that run in personal as well as collaborative mode. A debate of opinions in a community of practice would probably benefit from such tools in the early stages. A possible scenario for making a decision collaboratively could unfold with iterations including:

- using of a mind-mapping tool,
- exchanging opinions,
- arguing,
- voting.

This scenario involves the three kinds of tools described above. It is to be noticed that CoPe_it! has the goals described in this scenario but still lacks a bit of maturity.

3.4 Resource Management

3.4.1 Which Activities?

Managing common resources is an important activity for CoP members. Most of the PALETTE tools presented in this report provide a service that facilitates this activity, involving several tasks:

- creating personal and group resources;
- sharing resources (allowing other members to access the resources created);
- organizing the resources (storage, tagging, categorization);
- use and reuse of resources.

3.4.2 Additional Tools and Services

Google Docs

The description of the tool Amaya has shown the advantages of using a language like HTML to produce documents. Amaya allows the creation, modification and sharing of text while ensuring that the products are easily readable. This approach finished with one or several documents, a collection of files that you can print, post on a Web server or distribute by email. We know also that for working collectively on a common text wikis have opened a new era of collaboration. The description of SweetWiki is more than convincing on this point. With a wiki we no longer speak of files but rather of Web pages, and we no longer send a file but rather a Web address (URL). No need to install a program on the computer: you work online in a shared space, and the finished products can be stored online or taken up elsewhere, for example with other tools like Amaya, to stabilize the content of the documents.

Currently we are seeing the advent of a third approach, with online office productivity tools that distinguish themselves from the tools presented up to now. We have chosen Google Docs to illustrate the trend, but other services: Zoho (<http://www.zoho.com>) or Thinkfree (<http://www.thinkfree.com>) are also worth a look. Listed below are the Google Doc functionalities that are rather similar to other services of the same kind, and that would let CoP members collectively edit documents online. These services would be used while content is being created collaboratively; then this content could be exported and used or stored elsewhere, although these tools also offer storage for the content created.

- Each member creates an account and can then import already existing documents (Word, OpenOffice, RTF, HTML, plain text) or create content himself from scratch: the document type can be text, spreadsheet or presentation.
- The documents can be shared with other members and edited collaboratively. It is possible to designate any member to be a collaborator or just a reader who cannot edit content. It is possible to send an email at any time to all or just some of the collaborators/readers.
- Each member can file his/her documents with the help of a tagging system, curiously named "folders"; this system actually plays the role of keywords, since it is possible to file a document under several folders. On the other hand, this system remains personal and cannot be viewed by the other members. We therefore cannot really call it a tagging system which would be contributed to by the whole group.
- Documents are formatted with the help of a powerful WYSIWYG editor that attempts to mimic how a usual word processor works. It really feels like you are working with a word processor, with the usual menus but also with the possibilities that being an online service offer, such as the menus dealing with collaboration and publication. The online office productivity services are still far from rivalling word processors but they are constantly improved and we think that it is only a question of time. Unlike SweetWiki, the editor here is always in active mode and is integrated completely in the overall page.

- Google Docs offers a revision history of the documents, automatic saves, and a possibility to revert to a previous version. It is also possible to compare several versions to each other.
- When a document is finalized online, it is possible to publish it online so that it is available to everyone as a Web page, or directly integrated into a blog. Of course, it can also be exported in various current formats to be shared as a file.

Seeing that these functionalities approach those of word processors, one can ask, why still use a wiki to edit content collectively? These two types of services are not based on the same approach to usage. In fact, the online office productivity services can only edit one page at a time, that is, one document. If a CoP wants to create several "pages", they would have to create several documents. On the other hand, a wiki by definition lets you create pages linked to other pages, creating a kind of mini website. It is certainly possible to use a wiki to create simple pages, but in general wikis are used to build collections of navigable pages.

These services are therefore more like online office productivity suites, that is, web applications that reproduce the same functionalities as the usual office suites like Microsoft Office, Open Office... They are made very attractive by the fact that they solve the problem of portability of our document products in a novel and effective manner. Indeed, no more compatibility problems since everything is done online, usually independent of the local operating system or the local browser. In certain cases, however, we have noticed some slight differences depending on the browser used. We must admit that the code produce by Google Docs is most of the time invalid (cf. section 2.1.1). Nevertheless, they are easy to deploy for a CoP, since there is nothing to install and their maintenance and updates are taken care of continuously and behind the scenes, without our ever being aware of it. Finally, no logistical problems with collaboration since the documents are accessible and editable online at anytime and from any computer with a web browser.

To sum up, these applications allow you to take a nomadic approach to office work, without installing anything on the computer and at a modest price (since the basic versions are generally free). In truth, we have come upon several difficulties while using Google Docs. When working together on a large document, for example, we have had to resort to splitting it into two parts to avoid slowdowns caused by the frequent automatic saves. Some browsers react differently than others as soon as several collaborators work at the same time on the same document. In our experience, Apple's Safari has given the best results, strangely enough. It seems that Safari's interpreter for JavaScript, which is used extensively by this service, is the best or the most tolerant. One has to develop new habits, since Google Doc's interface, in spite of its close resemblance a classic word processor, is still less complete and has a much different approach. The tab "insertion" is particularly unusual. Until one has mastered the system, we recommend saving documents frequently.

Finally, let us remember that the data produced are owned by Google. So, what about privacy and security?

Wordpress.com

Wordpress.com is a content management system (CMS), used as a blog engine. This means that it allows anyone to easily create a blog. In simple terms, a blog is a personal website where you write articles (or posts) to which others can react simply by commenting. The article can be accompanied by multimedia elements (photos, videos...).

The arrival of blog systems has simplified the production process for content on the Web. Since the beginning of the Web possibilities have existed to produce content without major technical constraints. One can think of services such as Geocities (cf. <http://en.wikipedia.org/wiki/Geocities>), most web surfers used the Web mainly to access and read content. With a blog, it becomes possible to produce not so much Web pages, but a flow of information, with having to know HTML, without using file transfer programs (FTP), without needing to have a web space hosted on a hosting service, etc. Anyone can thus quickly create his/her own Web space and begin to produce and publish content. Anyone or any group, and that is where this type of tool is interesting for a CoP. Below are some illustrations that show how one or several blogs could be useful in a CoP.

- Blogs provides a simple and easy way to produce and publish content (articles), dated and classified in descending chronological order, newer content displacing older content towards the bottom. A CoP can thus create a "community" blog to create a communication channel for its members, but the members can also open "personal" blogs to progressively create a kind of journal of their activities within a CoP while preserving the links, text segments, documents, reflections, ideas, questions, etc. Note that it is possible to restrict access to a blog to only those persons we choose.
- It manages information in that it allows produce, publish, search, comment, preserve, link, gather and share information. It also plays the role of reminder, for one member or for the entire CoP.
- It lets readers comment on the published content, to criticize it, to enrich it and thus to engage in conversations with the author.
- Each published article has its own Web address (URL) which does not necessarily correspond to that of the Web page, since one page can contain several articles: one can thus easily refer to links to individual articles knowing that the links will always work.
- The articles are automatically archived by year, month, day but one can also group them by category by tagging them.
- Members can easily subscribe to the content of other blogs or to the blog of the CoP (by email, for example). Publication of new articles will automatically be announced.

We point out that the online office productivity services which we discussed previously offer an interesting functionality: after configuring them, it is possible to publish the edited document to a blog. Thus, another possible strategy, often used by the groups, is to work collectively on a document like Google Docs and then publishing the resulting text to a blog.

Del.icio.us

Del.icio.us is a website that allows you to save website bookmarks (favorites), that is, references to pages (Web addresses, URLs) that you have visited and that you wish to be able to return to. One could qualify it as a social website in that the bookmarks can be shared with all users of the site, or just some users. In order to find the pages again, you tag them using keywords. The tags are classified according to their popularity (frequency of use) either by the user of the service or by the network participants. In this sense, we speak of a folksonomy (kind of popular taxonomy). Launched in 2003 and acquired by Yahoo! in 2005, Del.icio.us has met great success and become somewhat of a standard for similar services created afterwards, some of which offer more functionality, such as Diigo you can find at the address: <http://www.diigo.com/>.

In the first section we presented two tools that allow you to tag content: SweetWiki, which lets you associate keywords to pages created in your own wikis; and eLogbook, which lets you tag the three main elements of the service (the assets, the actors' profiles and the activities). In a way, one could also consider that BayFac, through its use of document facet values, also uses keywords that have to come from an ontology of the CoP. What distinguishes a service like del.icio.us is that its sole purpose is to tag content. It does only that and it does it well, quickly and especially, simply. We will look at how this service operates, how it could be used by a CoP and how it differs from the two PALETTE services.

- Each participant (specifically a member of the CoP) is required to create a personal account with del.icio.us, containing his/her own bookmarks. By deciding to share certain bookmarks with other members, he/she can create a kind of common space (as in a space just for his/her CoP).
- Any kind of content on the Web that has a URL, whether it is a Web page, an image, an audio file, a video, etc., can be tagged and saved on del.icio.us. This is very different from the tagging systems integrated into other kinds of services, like SweetWiki, since only the pages created in SweetWiki can be tagged. It seems important to us to offer a service like del.icio.us

to complement others, so that a CoP can tag any type of content located anywhere on the Web, without having to choose a service beforehand. Note that del.icio.us could very well be used to tag SweetWiki pages, using it in a slightly different manner than usual.

- Tagging Web content is easy. It is not necessary to connect explicitly to the del.icio.us site to do so, since the main Web browsers offer extensions intended for this purpose. These extensions install two extra buttons on the browser interface that, with one click, let you save the current page location while adding tags and a description. Note that the URL and the page title are automatically recorded to make tagging yet simpler and faster. This activity is carried out in the same way as using the browser bookmark manager.
- Accessing tagged elements is done through the del.icio.us site directly from one's browser, provided that the necessary extensions are installed.
- The "social tagging" approach is different from that of SweetWiki. Whereas SweetWiki allows each user to tag pages, del.icio.us remains a personal indexation approach, but one that can be opened up later to a social dimension and thus to sharing, due to the fact that the tagged pages can be made accessible to the other users on the del.icio.us site. Through this it is possible to see and follow what other members are tagging. Note that in response to repeated requests, del.icio.us implemented an option that allows users to not share chosen content.
- Del.icio.us tags content with a flat structure, there is no hierarchy or ontology management, just tags. We think that this approach, which can seem simplistic, is the reason for the success of this service. Here there is no moderator, no organizer, no manager, no prerequisite steps to follow, no ontology to define first (even if these activities are quite pertinent in other contexts): the members of a CoP start off directly and choose their own tags, which lets them completely manage what they want to keep and to control the access to it. This personal system can very well be combined with a group system, requiring only an agreement on common tags. If Paul tags content with "fr", "paul", and "report", he can very well add the tags "palette" and "my-cop"; this allows all the content with the tags "palette" and "my-cop" to be accessed by the CoP members. We therefore have a service that lets you tag content for yourself without worrying about other users or contexts, and at the same time you can tag content for sharing and observation by other members. The two purposes can be mixed together. In the second case, one contributes to the emergence of a folksonomy, *i.e.* a collaborative classification system that is decentralized and spontaneous.
- To search their content or that of others, members can use the del.icio.us search engine by selecting tags. One can associate multiple tags, which allows a rapid retrieval of indexed content, by using the principle of associated tags. As an example, if one page has been tagged "report", "pdf" and "research", these three tags are "associated", because they are associated with the same tagged content. If Paul selects the tag "pdf" to find the list of all the online documents in PDF format that he has tagged, del.icio.us will suggest the tags "report" and "research". He will then be able to easily add other tags to the first one selected and thus reduce the number of search results, because only the content that satisfies all the search criteria will be listed. This is made possible without having to remember all the different possible tag associations, since the system takes care of it.
- As previously stated, content tagged through del.icio.us (documents, files, resources, Web links, etc.) are not stored by del.icio.us. The content can reside anywhere on the Web and does not necessarily have to be in the same location. This is the main difference that we see compared to tools like BayFac or eLogbook, which are intended primarily to collect and store documents within their system and which therefore require that the information be grouped beforehand. Del.icio.us stores only Web addresses (URLs). The Web is still the storage space, so to speak.
- The tagging activities of a group (a CoP) or of a particular individual (a CoP member) can be followed directly on the del.icio.us site, on any website or blog, since del.icio.us provides a snippet of HTML code that can be inserted in any Web page (given that one has permission to edit that page: blog, personal web page, wiki...). The code displays either a list of the last

saves or a tag cloud (the tag cloud displays the tags' text size in proportion to their popularity). On Facebook several applications, one of which is official, allows these two services to be connected (the CoP members who are also subscribed to Facebook would be notified of another member's new saves in real time). This surveillance can be used to watch certain keywords and be notified in real time when other members of the group (CoP) are tagging.

- Finally, del.icio.us can export the tags produced in standard bookmark file format, which can then be imported in a Web browser. Using del.icio.us generally leads to an abandonment of bookmarking with the browser, since it allows you to do the same thing yet with much more important advantages, such as sharing tagged content with other people and being able to access your bookmarks from any browser on any computer connected to the Internet.

Here are some concrete, simple examples of del.icio.us usage. Paul and Pierre are two members of the same CoP.

- <http://del.icio.us/paul/> shows a list of all the pages tagged by Paul.
- <http://del.icio.us/paul/palette> shows a list of all the pages that Paul has tagged "palette".
- <http://del.icio.us/paul/palette+sweetwiki> shows a list of all the pages tagged "palette" AND "sweetwiki" (which allows you to reduce the choice considerably; you can add as many tags as you want).
- <http://del.icio.us/pierre/palette> shows a list of all the pages that Pierre has tagged "palette".
- <http://del.icio.us/tag/palette> shows a list of all the pages tagged "palette" by any member (which lets you look up content with one or more tags, by a group of people).

Del.icio.us seems to be an interesting solution if you are looking for a content tagging service that is flexible, open and easy to use. It can be used for the purposes of an individual or of a group and it exists independently of editing tools and information storage tools, which does not necessitate a real change of habits. Note however that if the pages, document or other material tagged through del.icio.us change their URL (for example because they have been moved), this new information is not updated in del.icio.us, which over time can lead to a higher percentage of dead end links.

3.5 Communication

3.5.1 Which Activities ?

We have presented above a selected set of collaborative tools and services. We will now focus in this section on communication tools.

Everybody knows and makes a daily use of email: it became overtime the most popular communication tool. However even if email is a quite efficient tool for the personal management of information, it remains problematic when it is used to manage information communication within a group of people: recording and sharing the messages with other people is not that easy. Other software communication tools are available that provide a diversity and more efficiency in the way users can communicate.

There are three main aspects to consider:

- asynchronous communication: for exchanging information without requiring an online presence;
- synchronous communication: for exchanging information between two or more people who are online (example: chat);
- event notification and awareness (the art of making somebody aware of something): in a collaborative environment - an information space shared by several remote members - the idea of "awareness" refers to the possibility for online members to perceive the identity, the presence, the localization, the activity and the availability of the other members; being aware also includes being able to perceive what has happened in the group since the last connection: this refers to the history of the group activity.

3.5.2 Additional Tools and Services

Skype

We could not present computer communication tools without mentioning Skype. Exceptionally this is not a web service but a desktop application that has to be installed on anyone's computer. Different versions are available depending on the target system. Skype is probably the most popular tool among the instant messaging software such as Google Talk or MSN Messenger. This kind of tool allows for building a list of people (friends) with whom you can start to chat through text, audio or video. We selected Skype for presentation here because it provides the most comprehensive list of features and because its audio and video qualities are high when compared with other services. And it is free, so no need to use a phone, Skype replaces it.

Such tools seem very useful for CoP members:

- First, those tools display the list of online and available contacts (because you can indicate your status such as "available on phone" or "having a break" or "unavailable" a feature that is equivalent to the message of an answering machine). Because the other members of a distributed CoP do not necessarily work in the same location, it is then possible to create a "virtual link" through which you keep informed of the availability of other members and you can then contact them.
- It is also possible to quickly contact another community member on a non-intrusive basis - it differs from a telephone call for example - because the remote member will be able to read the message and answer when he/she decides.
- It is also different from email: those instant-messaging systems allows for an interactive dialogue in real time. It is easy to ask a question, to share an URL, to share a picture or a document, to request an advice... They are usually used for a brief information exchange in which a quick answer is required.

Moreover Skype - just like many other services - may be integrated to Facebook. Then the Skype status (online or unavailable or whatever) may appear within the Facebook member profile.

RSS

Most of the users who are not very ICT conscious do not know the RSS (Really Simple Syndication). This is probably because of its non-explicit acronym and because it is difficult to understand its advantages. To be precise RSS is not a service, nor a tool, but it is an Internet communication protocol that is used by almost every service described here. Still we have to mention it here because it has greatly facilitated communication over the Web, allowing many tools and services to inter-connect. It allows many users to keep informed of the latest news in such or such domain.

Let us take the example of a community member who wants to know what is happening on the community Web sites, in the different discussions or in the blogs of the other members, or what is new in the tagging activity (with tools like del.icio.us), what is taking place in all the different Web activities: without RSS he/she would have to connect to all the different Web sites and to check - sometimes with difficulty - whether there is something new. This is tedious, almost impossible to achieve, and it is likely that any user give up this strategy. So why not do it in a reverse way: instead of requiring that the users check the news and updates by themselves, there may be means to keep them informed automatically. This is what is achieved through RSS technology.

In short, RSS is based on an XML data-format that allows for broadcasting updates of a Web site, a blog, a service, or anything whose content is changed recurrently.

As soon as a new content is build, it is automatically available as an RSS stream. You can notice on some Web sites a little orange icon or a message like "subscribe to this site": you will have to download an "RSS stream reader" and subscribe to the many RSS feeds you are interested in. Then when you open your RSS reader you can quickly check the list of updates and access the new information without even connecting to the Web sites (however a link is available) - almost like you do with email.

There are different kinds of RSS readers:

- plain RSS readers - such as Google Reader - that are limited to managing RSS;
- Web clients that incorporate RSS in their latest release;
- email clients that include the RSS subscribe feature;
- some RSS readers that are integrated within some personalized Web sites (such as Netvibes or iGoogle) and which are very popular.

Facebook

The presentation already made in section 3.2.2 of some features of Facebook is motivated at first by the popularity of this software (it has a great many users), and also because it is explicitly built around a reference - to social computing, a new track of research and application that - just like communities of practice - is centred on identity. Every Facebook user describes himself with a personal set of information (a profile) and decides which members are his/her closest "friends". In other words we find in Facebook the two dimensions of identity: the individual and the group (Wenger). In this section we focus on the mechanism of notification of social events (awareness) which is implemented in Facebook and its integrated components. Indeed this is a complex service. In a collaborative computer environment some events happen that form the basic information which feeds the awareness service. Basically these events have to be defined through their conditions of occurrence and the detailed associated information they generate. The notification mechanism requires seamless integration between the software components. But the most difficult part consist in trading off between informing and making aware, between information push and information pull, user control and automatisms, too much information or not enough, and so on. Those difficult trade off turn the implementation of the notification mechanism (which is mainly technical) into a problem of user interface and user interaction that deals with human cognitive capabilities and motivation.

Every member in Facebook finds this awareness service on his/her home page: it is called the "News feed" (figure 49).

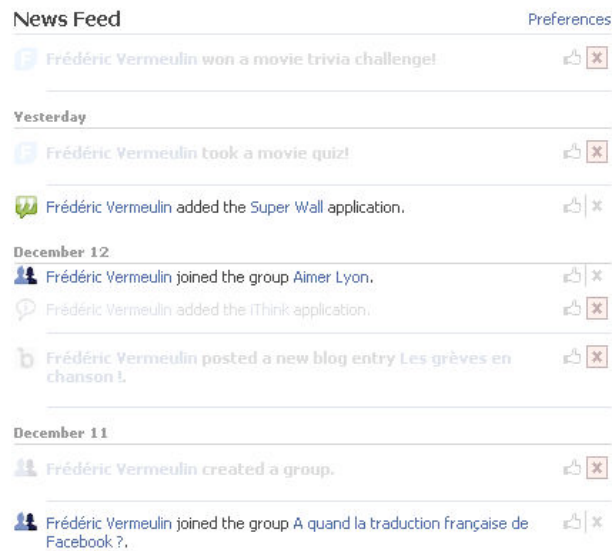


Figure 49

Looking at this screen shot one can notice certain events that feed the "news feed" section in Facebook. Most events (figure 50) are attached to some community member action (example: when a member starts a mini-application). But other events do not correspond to any action: example a member's birthday.

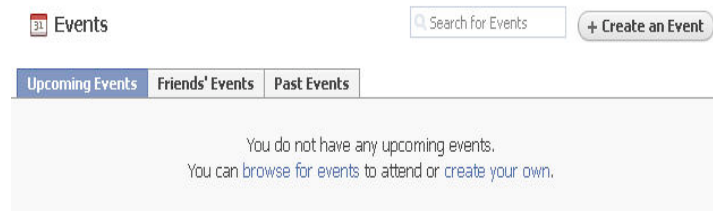


Figure 50

Some events are defined by the user himself/herself through the mini-application named "Events (for example the member's participation to a social event in the "real life"). Moreover each new mini-application which get integrated to Facebook prompts the user with a form where specific events (specific to this mini-application) should be defined, including their span (should the event notification reach "Only my friends" ... or beyond (figure 51). All these events will eventually feed the "News feed" section (Example: "Publish stories about...").



Figure 51

The Facebook user interface provides some interesting items:

- the date of events: Facebook makes a difference between "today", "yesterday" and the previous dates (this reinforces the perception of presence);
- information associated to an event show up with a summary or detailed option.
- when he/she receives the notification of an event, a Facebook user has still an active role: he/she may indicate that "I like/I do not like this";
- every event information provides links toward the actor and the activity which are the source of the event;
- a Facebook user is encouraged to survey (pull) the events or to broadcast (push) the event information to other members.

Twitter

We present here this simple and efficient tool - you may integrate it to Facebook - because the service it provides is close to awareness.

Twitter has been developed to provide the members of my community ("my friends") with a quick and simple answer to the question "what am I doing right now?" (figure 52).



Figure 52

Using Twitter is very simple and it is available for free: you get a 140 characters text-box you can fill to indicate what you are currently doing, and this message is broadcasted to whatever member you select (public account) or sent to your private network (private account). At the same time you can select those Twitter (or Facebook) members from which you decide to receive the "current work notification". Those members will then have the opportunity to include themselves within their own network.

Contrary to what happens in a group where people see each other, when people are remote what they are currently doing remains invisible. However this information would be very useful when it comes to ensure the coordination of the group. The computer of a remote member would be able to automatically notify the whole network with the basic operations which are performed on this remote computer ("operation" should be understood here according to the Activity Theory). But, according to Activity Theory (Leontiev) information about the operations is very seldom the level of information which is pertinent to keep other people informed; the pertinent information which is required is at the level of actions (driven by a goal) and activity (driven by a motive). This information has to be provided by the user himself/herself: he/she is the only one who knows exactly what he/she is doing, and the only one also who can decide of the appropriateness of notifying this information. This is exactly what Twitter offers to sustain the awareness within a group. It is simple, not too restrictive and quite efficient.

3.6 Panorama of additional tools and services

Service/tool	URL	Type	Cost
Facebook	http://facebook.com	service	free
Moodle	http://moodle.org	software	free
Moodle	http://moostic.ch	online service	charged if disk space > 20Mb
Google Calendar	http://google.com/calendar	service	free
Google Docs	http://docs.google.com	service	free (but a Google account is needed)
Wordpress.com	http://wordpress.com	service	free (additional options charged)
del.icio.us	http://del.icio.us	service	free
Skype	http://skype.org	Software	free (additional phone call charged)
Google Reader	http://google.com/reader	service	free
Netvibes	http://netvibes.com	service	free
iGoogle	http://docs.google.com	service	free
Twitter	http://twitter.com/	service	free

4 Conclusion and perspectives

Tools and services either internal or external to PALETTE

We have presented above a selection of six PALETTE tools and services which have been chosen because their development is either well advanced or rapidly evolving. We wish each perspective adopted in our presentation will bring specific information, shading light on a tool particular aspect. We have then added to our descriptions some reflections about a few tools and services which are developed outside the PALETTE project. Some of them are complex, some have goals of their own which are different from the project objectives - we then tried to focus on some of their features which seem interesting because they are consistent with the objectives of PALETTE. Thus we investigated the advantages of these tools for what concerns the life and development of communities of practice. This section cannot pretend to be exhaustive: the "social Web" is a "large nursery" where hundreds of new software applications appear every day. But the tools we decided to present here seem to have the capabilities to support CoPs members across a wide range of activities. The features of these tool may be source of inspiration for the developers of the project: the indisputable advantage of the PALETTE tools and services - over external tools - is that they are fully customizable according to the needs and wishes of the CoP members and their mediators; this is required by the participative approach which has been adopted by the project.

Collaboration

All the tools considered in this document, whether those developed in the PALETTE project framework or the external ones, echo the collaboration which, logically, should be the most important concern in CoPs. However, working in a collaborative fashion is, for many of us (members of various CoPs), a practice that is far from well-trying. Therefore, the tools and services that claim to support this collaboration now have to show some evidence proving a strong intrinsic utility and usability.

Without a doubt, all of those that we have examined are useful. Some of them, like Amaya or LimSee3, are multimedia and Web authoring tools. The very nature of what they produce is to be shared out. A service such as SweetWiki incorporates and mixes two important functionalities: collaborative Web page editing and their tagging. eLogbook and CoPe_it! claim to be innovative services, offering spaces for sharing and modeling collaboration each in their own way: the former by clearly identifying some key concepts of said collaboration (activities, actors and assets), by conceptualizing their relationships (role of an actor in an activity, rights of an actor on an asset,...) and by implementing a state-of-the-art awareness service. The latter by giving us a lot of duties in the organization of this collaboration, through the implementation of the very unrestricted – it has to be said – concept of the whiteboard (work space). BayFac, for its part, focuses essentially on the hypothetical abundance of the resources managed in a CoP and offers an intelligent and original system for classifying them.

However, there is a spot where the work to be done is still huge: the quality of user interfaces which still lack in guidance and which exhibit compatibility problems with the interfaces we are used to in our day-to-day practice. Nevertheless, analyses are made, problems are identified and solutions are being sought collectively. The progress is evident. In the coming months, we will focus at measuring this evolution.

As for the external tools and services, they put more emphasis on the social aspects, that are also present in PALETTE services, but in a more discreet fashion. Several features they offer can certainly inspire PALETTE developers, particularly in respect to these issues, but also in respect to the quasi simultaneous collaborative editing aspects.

New practices

For those tools and services to be really useful to us and to our CoPs, we also have to agree to change our practices in favour of new ones. One of those which clearly emerge from the review of all these tools is the practice of tagging. Making explicit the knowledge, reifying practices, sharing resources has an unavoidable consequence: the abundance of information of all kind and forms. Today, there is a

plethora of tools and services offering the ability to tag and annotate information with the goal of retrieving it easily. These practices are not natural for those who are used to think with the classic metaphor of files and folders. It has to be noticed though that today, what we search is not necessarily a file on a local hard drive, but can be a Web page, an email address, an image inside a document, the body of an email, etc. This coerces us to think again how we manage information, not necessarily by classifying it, but in the manner of Perrault's Hop o' My Thumb, sowing the stones that will help us to find our way to information.

Another new practice which marks our time is collaborative editing. One can rejoice that nowadays some services like Google Docs are able to manage with really good results the work of several people on a single document, in a quasi synchronous way. Of course, it does not resolve organization problems, that are the privilege of human beings (layout convention consensus, management of interactions – when should we use comments, when should we make direct amendments in the body of the text? – consistency matters, etc.). In this domain, a lot of lessons are still likely to be drawn.

We probably live in the fear of giving too much (or inadequate) information about us. Yet many of the services that we talked about encourage the cult of personality. Who are we? What are we doing? What are we interested in? What words will we chose to tag information? These bits of information in the wild can make us feel as if our clothes were taken off in public. However, they are also viewed as incentives to action, to reaction, to interaction. It is our task to balance the value and risks of such proceedings.

Needless to say, the transition is far from done for many of us, but one can hope that the present document can help us to tame or at least to fear less such practices that we could see as intrusive.

Prospects

The universal tool or service does not exist. Whatever the state of their development, tools are mostly dedicated to tasks rather than to people or groups. It is part of the difficulty of PALETTE tools and services: they have a hard time to find their place in the complex world of communities of practice. There is a way that looks promising: identifying clearly several generic tasks that are unique to CoPs members. It is the main objective of the project during the third year of its life: identify generic scenarios describing a linking of tasks and so, make tools and services interoperate. If we can describe these tasks at a satisfying level, we have chances to reach our goal: in other words, a chance to change some of PALETTE services into specific CoPs-oriented services. For instance, we will closely follow with interest the development of eLogbook. It does not mean that tools such as Amaya or LimSee3 are less useful. On the contrary, helping CoPs members building products that are highly reusable is a sign of positive development of information sharing. In the following months, we will look at the real progress reached in the development of PALETTE tools and services, by measuring the action of participatory design that has been put in place. A publication will follow in a few months about this matter. Finally, keeping an eye on what is created can provide us and CoPs leaders with good ideas and good supports for the development of CoPs. Of course, ICT development is a hard to master topic. New ideas arise constantly, and features are developed in the aftermath. Uses ensue, but not necessarily following a deterministic logic. But we have to admit today that practices can and must evolve at the same pace as technology. It is an energy consuming process, but it is rare that we ultimately lose. Is not the real challenge for us, CoPs members wishing to adopt ICT, to get used to this permanent volatility? Instead of falling asleep, we now have to be vigilant so that we do not miss important events and advents.

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