The eLogBook Framework: Sustaining Interaction, Collaboration, and Learning in Laboratory-Oriented CoPs

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Abstract

Convinced by the important role of CoPs and the innovative learning modality they offer, the École Polytechnique Fédérale de Lausanne is currently developing a framework to sustain interaction, collaboration and learning in laboratory-oriented CoPs, namely the eLogBook. This paper describes the services provided by this framework, the 3A model on which it is based, and the main features it presents.

The eLogBook presents several innovative features that make it different from other classical collaboration workspaces. The eLogBook offers a high level of flexibility and adaptability so that it can fit the requirements of various CoPs. It allows CoPs' members to define their own rules, protocols, and vocabularies. The eLogBook also focus on usability and user acceptance thanks to its personalization and contextualization mechanisms. Finally, the eLogBook provides community's members with ubiquitous services thanks to its multiple views and its advanced awareness services.

I. Introduction

Since 2000, the École Polytechnique Fédérale de Lausanne (EPFL) has been deploying the eMersion Environment, which is a Web-based environment for sustaining remote and virtual experimentation activities in higher engineering education [1]. The eMersion environment provides students and teachers with services covering the main needs for carrying out collaborative hands-on activities such as controlling access to experimentation resources, storing and sharing experimental data, managing tasks and activities and supporting and monitoring the learning process.

Evaluations performed over the last 8 semesters' periods showed a great acceptance of the eMersion environment by students, Teaching assistants, and professors [2]. These results are all the more encouraging as the use of eMersion is completely optional and that the students always have the possibility of carrying out their experiments within the university campus in a traditional face-to-face way.

These evaluations demonstrate clearly that the key service for the acceptance of the learning modality and the appropriation of the environment by the students is a shared electronic notebook called the eJournal, which has been introduced to support collaboration and interaction between the members of a learning community [3]. This tool allows flexible integration and collaborative usage of laboratory resources to support

knowledge building and sharing within the learning community.

In the context of the Palette European integrated project (palette.ercim.org), the eJournal and the associated features are currently enhanced and extended in order to address the needs of a broader range of Communities of Practise, involved in management, education & engineering, and to effectively support mediated interaction, collaboration, and learning. Laboratory-oriented CoPs are group of people interacting freely to deepen their knowledge and know-how through interaction and experimentation in a specific domain where laboratory equipment is involved. As example, educators, teaching assistants and students involved in a laboratory course form such a community. Researchers and technicians working on shared equipment or studying samples form another one. Teams of engineers involved in collaborative engineering activities are also laboratory-oriented CoPs.

Extending the eJournal in order to support Laboratory-oriented CoPs is motivated by the fact that CoPs have been recognized as effective environments to support learning in professional organisations and educational institutions [4]. In both academic and professional context, communities of practices (CoPs) represent an interesting alternative to formal and institutional learning and training. CoPs allow bypassing organizations' boundaries and building virtual communities of actors sharing common interests and goals. When formal learning is more focusing on information delivery, CoPs focus on participation and collaboration and help members to capitalize and share knowledge, to develop collaboration and cooperation skills, and to enhance argumentation and negotiation capabilities [4]

This paper describes our work aiming at extending the eJournal to become an innovative framework for sustaining interaction, collaboration, and learning in laboratory-oriented CoPs. Our work started by a modelling phase where the objective is to propose a model for structure and behaviour of laboratory-oriented CoPs. Then, this model has been implemented as a generic framework called the eLogBook framework. The paper is organised as follow. Section 2 gives a short overview of the eJournal tool and its main services and features. Section 3 presents the 3A model we propose for laboratory-oriented CoPs. The five main concepts of this model, which are Actors, Activities, Assets, Events, and Protocols, are detailed. Section 4 describes the eLogBook framework and its main services. Two important paradigms we adopted for the implementation of the eLogBook are described. The first one is the multiple views paradigm. The second one is the contextual visualisation and navigation paradigm. Section 5 concludes the paper and presents the current state of implementation and the perspectives for the next months.

II. The eJournal tool

The eJournal is a more than a digital asset management system [5], an ePortfolio [6] or an electronic laboratory notebook [7]. Is can be defined as an assets-based interaction system. Its core feature is designed as a mailbox, a familiar metaphor for users. Instead of simple emails, the eJournal contains digital assets of various types. Contrary to a mailbox that belongs to a unique person, the eJournal is shared by members of a team. The team members can either tag or annotate the assets at creation or later. Some context-related tags and metadata are also automatically added when the assets are created.

In addition to the mailbox-like *Asset* area, located in the bottom part of Fig. 1, the eJournal seemingly integrates contextual and awareness information in the workspace (top-part in Fig. 1). The idea behind this design is that the users should not have to look for basic context and awareness information elsewhere [ref]. They should not even have to think about finding such information. It should be implicitly obtained while manipulating assets. As an example, the *Team* area

provides awareness about the role and right for the user in the given context, as well as indications regarding the possible presence of other team members. The *Activity* area provides information regarding pending tasks. The *Folder* area provides means to filter the context-oriented assets to be displayed. The *Category* column in the *Asset* area is used to summarize user and system-defined metadata.

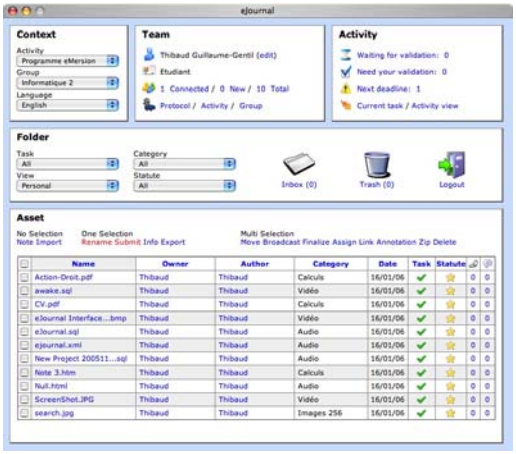

Fig. 1. The eJournal user interface

The eJournal differs from typical digital assets management (DAM) systems in many aspects. First, the eJournal was initially designed for e-Learning applications where the process of creating assets & reflecting over assets by linking & tagging & rating them, has more value than the assets themselves. DAM systems are typically designed for digital-repository applications (pictures, movies, documents, etc) where the value is only in the assets. In addition, the eJournal is a pivotal service to built more comprehensive systems integrating other asset-oriented components/services, while DAM are usually closed systems due to right management constraints. One could also compare the eJournal with forums or blogs supporting group work. Forums and blogs are driven by comments, some of those comments being possibly augmented by assets. The eJournal is driven by assets, some of those assets being possibly augmented by comments.

Interaction within the eJournal is mostly asynchronous since many of the actions performed do not required other components or users to be active or online at the same time. For this reason, the eJournal user interface only provides simple synchronous awareness indicators (as example, the current number of members online instead of the full list of their names). The state of these indicators may trigger interest for more detailed or additional information in some contexts.

III. The 3A Model for Laboratory-oriented CoPs

Despite the large acceptance of the eJournal tool by students and teachers at EPFL, this tool has a very constraining limitation. In fact, the eJournal has been designed to be used in formal learning context where the community is ruled by fixed and predefined rules. In the context of Palette European project, we are currently working on a new framework, namely the eLogBook, involving the main features of the eJournal, but more flexible and more adaptable so that it can be used in any laboratory-oriented CoPs. The idea behind is to cover not only formal learning modalities in academic institutions, but also knowledge sharing and collaborative learning in both academic and professional learning.

The first step towards this objective is to model the interaction and collaboration processes within laboratory-oriented CoPs. Many models of CoPs already exist, e.g. [4] and [8]. Almost the whole of these models meet on the basic concepts with certain nuances in their definitions and their relations. However, our study of these models made it possible to release certain limitations which motivated us to develop our own model. The main limitations are:

1. The majority of the studied models are very detailed and complex. They focus on a detailed presentation of all the structural abstractions and links related to CoPs. This complexity makes it very difficult to translate these models into usable and functional environments.

2. In the majority of the studied models, two extremes dominate: models that just focus on structural aspects and do not involve behavioural ones and models that involve rigid and constraining rules and protocols to describe CoPs dynamics and behaviours.
3. None the existing models makes it possible to consider heterogeneous communities mixing human and software actors. In laboratory-oriented CoPs, the role played by experimentation equipment and tools are as relevant as that of human actors.
4. None of the existing models allows dynamic allocation of accessibility & visibility rights over assets & activities.
5. Lastly, the existing models do not consider the concept of CoPs memory. Indeed, since the majority of models focuses on a structural representation of the community, it is often impossible to have a sight on the lifecycle of CoPs and their productions.

Basing on the results of our study on existing models, we worked on a new simple model, much more adapted to laboratory-oriented CoPs. When developing this model, we mainly focused on three aspects: simplicity of the model, extensibility and adaptability to various context and situation, and balance between the structural and the behavioural modelling on the CoPs and its lifecycle.

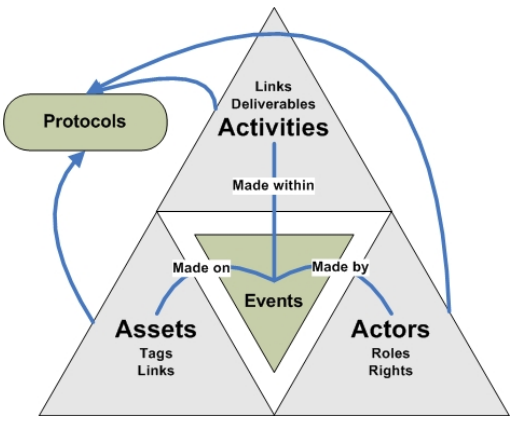

Fig. 2. Main concepts of the 3A model

The model we propose, namely the 3A model, is based on three structural concepts and two behavioural ones. The three structural concepts are Actors, Assets and Activities (from where the name of the model 3A). The two behavioural concepts are the events and the protocols. All these concepts are detailed in the next paragraphs (Fig. 2).

III.1. The concept of Actor

In the 3A model we consider as actor any entity capable of triggering an event or performing an action that can be perceived directly or indirectly by the community. The typical example of an event or an action is to create a new document in the community's repository and to share it with other actors. This definition exceeds the simple human actors but integrates also any tools or services making it possible to create assets in an automatic way, to access a list of asset, to modify the state or the characteristic of an asset, and so on.

This extension of the concept of actor meets an essential need in the context for laboratory-oriented CoPs, which is to build heterogeneous communities involving human users, tools, and services. In heterogeneous communities, interaction between human members is as important as interaction between users and experimentation resources.

It is important to clearly separate here between tools or services that play the role of an actor within the community by creating, accessing and manipulating assets, and on the other hand, tools and services that are just used by users in order to perform their own activities. In many CoPs models, such tools are called resources. In The 3A model, only tools that interact directly with the assets of the community are considered as actors. For example, we consider as an actor a simulation tool that produces measurement files and sends them automatically to the assets repository.

III.2. The concept of Activity

CoPs can range from well-structured entities with well defined objectives to unstructured entities where members interact and communicate without predefined objectives, except sharing information. For laboratory-oriented CoPs, we are generally dealing with structured communities where the goals are well defined. In this case, it is necessary to classify and organise the actions, interaction, and events performed by members of the community into activities. A community can have several running activities with several groups that can, jointly or separately, work and contribute in each of these running activities.

An actor can be active in one or more activities. However, and within the framework of an activity, an actor always has a well defined role. The roles are not preset, but defined by the responsible of the activity, who is generally its creator.

It is possible to associate one or more deliverables to a running activity. Adding deliverables enforces or reminds the members that they are expected to submit assets before a possible deadline, as a contribution to a specific task.

There are two kinds of deliverables. Deliverables without review are automatically considered as completed when an authorized member associates an asset with them (we call this action an asset submission). For deliverables with review, submitted assets have to be accepted by a reviewer. The list of reviewers for a deliverable is defined through the list of roles.

The activities can have semantic links which connect them. Thus, an activity can be a sub-activity, a continuation, or an alternative to another one. No predefined links are proposed and the community members have to define by themselves the links appropriate to structure their activities. The semantic links between the activities allow rich navigation and clustering facilities to the community actors.

III.3. The concept of Asset

An asset is any entity produced by the actors of the community, stored in the community's repository and exploited by other actors. The simplest and most known form of assets is documents and files. The documents being the most traditional form of information sharing and exchange, they represent the most used assets within CoPs. However, in our model, this concept integrates also other forms of information produced by the members of a community. Among them, we can mention images, comments, dialogues, and so on.

In the 3A model, an asset is always contextual. Thus, an asset is always associated to one or more actors (initial creators, owners, viewers) and related to an activity, where it is created.

Several actions can be performed over assets such as rating, linking & tagging:

To start with, an asset can be augmented and annotated by semantic tags. The tags are created by the actors involved in the same activity. There is no preset list of tags. The actors progressively create them and thus build their own vocabulary. The annotation of assets makes it possible to carry out advanced clustering, filtering and research.

In addition to the annotation mechanism, the 3A model considers also the possibility of connecting assets between them by using semantic links. For example, a graphical asset can be an illustration for another textual asset, an asset containing numerical data can be connected to simulation code as its entry.

III.4. Mediation role of Events

In order to model the dynamic and behavioural aspect of a community, we introduced the concept of events. In fact, an event can be defined as the persistent representation of all actions performed by actors. The concept of event makes it possible to situate and store the actions and operations performed during the activities' lifecycle.

An event is a pivotal concept that connects assets, actors and activities all together. In fact, an event is generally carried out by an actor, on an asset, within the framework of an activity. A typical event is for example the creation of a new asset by a given actor within the framework of a given activity. Other examples are the annotation of an asset, the association of a comment for an asset, the suppression of an asset, and the submission of an asset as deliverable.

The 3A model also defines events which are not directly asset-related but actor-related. These events are useful only for tracking and memorizing the profiles of actors. For example, registering to an activity, creation of a new activity, and sending invitation for an actor to participate in an activity are examples of actor-related events.

Events play a very important mediation role in the 3A model. In fact, combining asset-related and actor-related events makes it possible to build an incremental representation of the community dynamics and behaviours. This can be used in order to provide actors with advanced awareness such as activities' work progress, actors' activeness, actors' profiles and preferences, assets' circulation, and so on.

This awareness has been recognized to be an affective instrument in sustaining motivation among actors, in enhancing collaboration and interaction between actors, in supporting coordination and mediation within CoPs, and in building adaptable and personalized views and services for actors.

III.5. The Contextualization role of Protocols

The protocol is the framework that rules and governs the events of a community. It is always related to an active context and allows deciding whether a given actor has the right to perform a given action on a given asset in the framework of a given activity. An example is to decide whether an actor can submit a given asset as a deliverable for a given activity. More generally, several types of access rules or rights govern Assets & Activities. No actor can perform an action over an asset within an activity or over an activity, unless he is assigned the right to do so. In addition, rights can either be static or dynamic. To explain, the right to access an asset and/or activity can be assigned statically, to a specific actor. However, it is also possible to assign rights dynamically on a membership or even a role basis. For instance, if the author(s) of an asset decides to make it viewable to members of a specific activity at time t. If a new member joins the activity at time t+1, then he can also see the asset. However, when an actor is no longer member of this activity at time t+1, then he can no longer see the asset in his workspace, nor can he have access to the new tags, links, rates, and awareness statistics related to the asset. The same applies, for rights over activities which can also be defined in a static as well as dynamic way. For instance, an actor has access to a specific activity which is the, as long as he has a specific role in another activity, which is linked of the former. For example, a student assistant has access to "Prelab Evaluation" only because he is a member of "Mechanics Laboratory" with the role "assistant validator". When the former condition is no longer valid, he looses his access rights over "Prelab Evaluation".

The table below lists all possible rights related to activities and assets. It is worth noting the parallelism which not only exist in the way rights are given to actors (statically or dynamically through their membership and their role in an activity) but also in the kind of right given over an activity or an asset.

Activity	**Asset**
View	*View*
Modify/Delete	*Modify/Delete*
Manage Visibility	*Manage Visibility*
Manage Membership	*Manage Ownership*
Link	*Link*
Tag	*Tag*
Submit Deliverable	*Rate*
Evaluate Deliverable	
Post Assets	
Add Deliverable	

Manage Roles (create, edit, assign)	

Table 1. Rights over Activities & Assets

But this is not all, through the observation & the analysis of the needs & urges of Palette CoPs, it was noticed that there are general conventions over who can do what. For that reasons, default rights over activities & Assets were made available. For example, in the table above, in the first column, rights in italic are right automatically given to members of an activity. Those in bold are automatically given to the admin of the activity (its creator). The same applies for assets; its author(s) and owners (actors that were given access to it by its authors) have all rights over it. However, all these settings can be parameterized in order to address specific cases. For example, in the context of EPFL laboratory-oriented CoP of students, the teacher wishes to give the right of rating or evaluating a posted asset in the "Mechanics Lab Session 1" activity, only to the members having the role of "assistants" and not to those with the role "Students".

Another important possible feature is that it is possible to make an activity visible by non-members, but disallowing them to collaborate (post assets, link them, link the activity to others etc…) within this activity unless they become members. This feature is comparable to forums where you can read what is happening but you can't contribute unless you become member.

Consequently, the eLogBook convention-based but extremely flexible and adaptable protocols with the possibility of assigning dynamic & static rights, is able to answers general as well as specific needs and requirements for various laboratory-oriented CoPs.

The dynamic construction of the protocol is not only useful to govern the events and control them, but mainly to define an active context allowing dynamically adapting the interfaces and the functions offered to the actors. Disabling inaccessible actions over assets, building personalized views, and highlighting some kind of awareness, all are simple examples of contextualisation role of protocols. This contextualisation mechanism increases the usability of an environment dedicated to support CoPs, and enhances the appropriation of such environment by the actors.

IV. Implementation of the 3A model: The eLogBook Framework

The eLogBook is a collaborative Web-Based environment aiming at sustaining and strengthening collaboration and coordination in laboratory-oriented CoPs. It is designed as an implementation of the 3A model and consists of an activity-oriented workspace where Actors, engaged in Activities, perform several actions (such as linking, submittal, evaluation, sharing etc.) over stored Assets. Protocols are used to define access rights of Actors over Activities and Assets.

IV.1. Functional description of the eLogBook

The main services provided by the eLogBook are Asset management, Actors and notification preferences management, activity management, events logging, and awareness building and visualization.

Asset management

eLogBook offers a collaborative space where assets can be created, stored, uploaded, downloaded and exchanged among all or some members of the community. The main functions that the eLogBook provides for assets management are:

- Assets' repository: All assets created by actors are stored in a common repository. The assets are clustered relating to activities. Access rights associated to an asset can be set by default depending on the activity rules, or redefined by the creator. In this case, the asset's creator can give access to specific actors and/or actors having specific roles. An actor can see

an asset if he has a specific role within an activity which gives him a right over this asset, if he is member of an activity which was rights over this asset, or if he was given right over it on a direct personal basis.

- Assets' Linking and Tagging: Each actor can define tags over the assets he can access. He can choose to make his tags private, viewable only by some groups, or public to the whole community. Each member can also link assets and specify the appropriate type of link.
- Assets Submission: An Asset can be submitted or delivered as a response to a specific delivery requirement within an activity.
- Assets Evaluation: For some deliverable, a reviewing in mandatory. In this case, the deliverable is considered as achieved only after an evaluation of the submitted asset by a reviewer. An Asset can be rated and evaluated by specific actors depending on their role in the activity.

Management of User Profile & Notification Preferences

Every member has a space where he can edit his personal profile and his notification preferences. The member's personal profile includes his contact information, as well as his level of expertise and domain of interest.

The member's notification preferences include the specifications of what, how and when he would like to be notified. This means that, by default, there exist some notification rules for all the community members. Nonetheless any member can choose to tune these rules according to his own preferences.

Activity Management

All the members of a community are considered to take part of a main activity which purpose or objective is nothing but the reason behind the existence or the creation of this community. Moreover, and under the umbrella of the main activity, members of a community can form subgroups to take part of sub-activities where different roles can possibly be defined.

Each activity has its own purpose, description, its own protocol, concerning possible expected deliverables, conditions for joining, its own administrator, and its private space to collaborate and share assets.

Events Logging

The eLogBook keeps track of the history of the community. All events occurring within the eLogBook are logged not only in a chronological order but also, and more importantly, in a contextual fashion; every action is traced within the context in which it occurred. Moreover, it is worth mentioning that the use of event logging to provide awareness takes into account the privacy of each actor and the privacy of each subgroup, in the sense that, actors are held "aware" of actions and events that only concern the activities in which they are involved.

Awareness Services

The eLogBook Awareness services rely on all the previous services in order to provide for each and every user three main interconnected types of awareness:

- Asset-Based Awareness: This is the main type of awareness. It includes informing each and every actor about all events that revolve around the assets that are being exchanged within the community and within the groups to which he belongs. This includes informing him about the creation of new assets, new links and tags over these assets as well as the evaluation, or submission of assets. It also includes statistics about how many members have access over a specific assets and how many have read it, tagged it, evaluated it, and so on.

- Actor-Based Awareness: This includes informing each and every actor of the state of other members that are involved with him in activities (connected, absent, busy) as well as suggestion of candidate members who can provide help about specific issues. It also includes notifications of new members' arrival.

- Activity or Task-Based Awareness: This includes reminding the members of their dues when they are expected to deliver something or evaluate something within a specific activity and the deadline for this submission is close.

IV.2. The Multiple Views of the eLogBook

In order to enhance the acceptance and the appropriation of the eLogBook actors of laboratory-oriented CoPs, the eLogBook provides multiple views. Each view is supposed to answer the specific needs of a work modality. Three main modalities have been considered: synchronous interaction, asynchronous interaction, and mobile interaction.

Sustaining asynchronous interaction through activity-oriented view

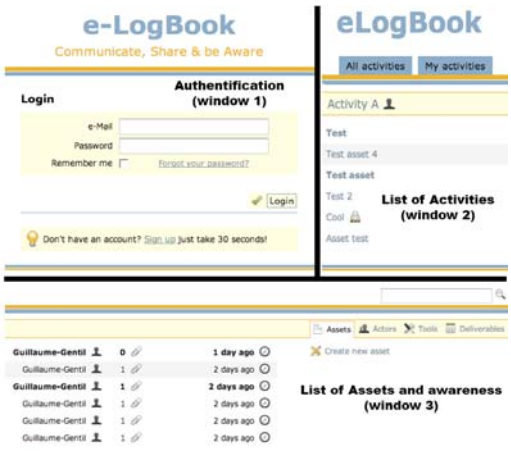

Fig. 3. Some windows of the Activity-oriented View

The first view provided by the eLogBook aims at providing actors with a contextual and comprehensive representation of running activities. The activity-oriented view is a web-based interface offering all the services and functions described in the previous section. It mainly allows navigation into activities and access and manipulation of the involved assets. However, navigation into activities and manipulation of assets are made easier and more efficient thanks to all awareness information embedded into this view.

Usability has also been enhanced through the introduction of the mechanism of contextualisation and personalization. The idea is to avoid classical list-based views and to use adequate graphical metaphors in order to display all assets and activities and to intelligibly express the different kinds of relations existing between displayed items. For example, when an actor accesses a given activity, he would not be interested by having a classical list of all existing assets. It would be more efficient to highlight to him assets that fit with its context and preferences such as the last asset he manipulate, the last assets created, the links and comments added to its assets, and so on.

In other words, we have focused on "Visually" highlighting the relative relevancy and importance of the displayed elements displayed with respect to the actor context and preferences. We also allow him/her to seemingly "participate" in the design of the interface by dynamically adapting the views according to his/her own style and allowing him/her to filter the displayed information through the use of smart views.

Sustaining synchronous interaction through actor-oriented view

Synchronous interaction and awareness in laboratory-oriented CoPs may require knowledge about the presence of the members, the state of the equipment and the status of the activities. To provide this variety of information in a simple way, we have introduced an actor-oriented view, which focus on the status of the community's actors.

Fig. 4. Actor-oriented view of the eLogBook

In order to develop this view, we adapted the Hexagon tool (http://kmi.open.ac.uk/technologies/) developed by the Knowledge Media Institute of The Open University in the United Kingdom. The Hexagon is basically a virtual video chat room. The online members are visible and can be clustered or put away according the user interests (Fig. 3).

To be suitable for supporting a hybrid community, any relevant piece of equipment is considered as an actor of the community. Hence, devices, such as the electrical drives displayed in Fig. 3, are visible in the virtual video chat room. To push further this idea of non-human actors joining the community, composite images are built using additional awareness information and pushed in video channels of the room (left-hand side hexagon). This feature is implemented by using a special video digitizer.

Sustaining mobile interaction through ubiquitous mobile view

Providing ubiquitous awareness to mobile members of a community does not mean cloning what is available on a desktop computer. One should focus on the necessary and sufficient requirements for people on the move, as well as the actual capabilities and features of current and next generation mobile devices. In other word, the service should be designed for the Today high-end devices which correspond to what the majority of people will be using in a one or two years horizon. In term of PDA, mobile phones, portable play stations and audio/video players; we should consider audio and video Input/Output, GPRS, WiFi and/or 3G networks as available features.

According to these features, the proposed solution to provide ubiquitous awareness to mobile actors of laboratory-oriented CoPs is a feed-oriented client interface instead of a traditional email, calendar or agenda-like one. This service should be always active. In fact, RSS (Really Simple Syndication) or Atom feeds displayed by the so-called Feed Navigator client have the necessary structure to support awareness broadcasting, knowledge dissemination or assets delivery. A feed can be updated right away when something occurs in the laboratory-oriented CoPs (creation, event, action, discussion). It has a creator, a title, a summary (annotation), metadata (tags) and possibly an attached file (asset) or the URL of an asset-oriented service.

Fig. 4. Feed navigator for mobile actors

The Feed Navigator will be designed to display these relevant elements in the most convenient way for minimizing the users'

actions and maximizing context-awareness. Feeds navigation through scroll wheels like the one found on Clie or Blackberry devices, or even more advance iPod-like tactile wheels will improve usability. The main difference between the Feed Navigator and an email client is that the user subscribes only to the feeds he or she wants to receive. In addition, instead of being only classified by date, size, sender, etc, the feeds could be classified according to elements like action request, action report, asset request, asset received, comment request, comment received, priority, deadlines, etc.

V. Conclusion & perspectives

This paper presented a Software Framework, namely the eLogBook, developed by the EPFL, with the aim of sustaining collaborative learning and knowledge building within laboratory-oriented CoPs. Contrarely to traditional learning modalities, CoPs are non-formal structures, often virtual, governed by moving rules, often built dynamically by community actors. The eLogBook has been designed to fulfil the requirements of this specific context and to make it possible for a community to build its own protocol by defining appropriate roles, vocabularies, semantics, and so on.

The eLogBook is an implementation of the 3A model we proposed in order to model the structures and the behaviours of laboratory-oriented CoPs. The 3A model is mainly built on five concepts, which are Actors, Assets, and Activities for the structural part, and Events and Protocols for the behavioural one.

The eLogBook presents some innovative features that make it different from other classical collaboration workspaces. First, the eLogBook is flexible and adaptable so that it can fit the requirements of various CoPs. Second, the eLogBook is usable and optimal thanks to its personalization and contextualisation mechanisms. finally, the eLogBook is ubiquitous thanks to its multiple views and its advanced awareness services.

Achieving the implementation of all the views of the eLogBook is planned for the next 6 months. Then, a validation and evaluation process will be conducted in the framework of the Palette European project. In this context, the eLogBook is supposed to be used by multiple CoPs and evaluated both technically and pedagogically. At this moment, the eLogBook is still under development. various CoPs. focus on adaptability and personalization in order

In parallel to the implementation of the eLogBook, we are investigating some issues dealing with interaction and collaboration in CoPs. The first issue we are working on is awareness. Our goal here is to develop a generic framework to sustain awareness building and visualisation in any collaborative environment. The second issue we are working on is to couple the eLogBook with efficient knowledge management tools. The idea is to help communities to build their own ontologies and to benefit from knowledge extraction and classification services. The last aspect we are targeting is to enhance voice/video-based communication within CoPs. The idea is to reinforce the activity of community members by encouraging dialogue and argumentation, by increasing motivation, and by building mutual trust.

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