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Project-Team WAM

Web, Adaptation and Multimedia

Grenoble - Rhône-Alpes

THEME SYM C

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2. Overall Objectives

The WAM project-team (Web, Adaptation and Multimedia) was created in January 2003 to explore the field of adaptive multimedia on the Web, with a special focus on XML documents processing.

2.1. The Multimedia Web

Diversity on the Web increases steadily, be it the diversity of information, the diversity of access devices and communication networks or the diversity of the audience. Diversity of information comes from the multimedia Web. Information shared on the Web consists of text for a significant part, but also of pictures, drawings, video, animations, music, voice, etc. These contents can just stand independently from each other, like a movie or a song that can be played for itself. The multimedia documents we consider in our research are compound documents that tightly integrate pieces of information from different media. In these multimedia documents, the various components have to be rigorously choreographed to make sense as a whole.

Devices also are multiple. The workstation or personal computer that was typically used in the early days of the Web is no longer the dominant access device. In Japan, for instance, more cell phones than PCs are now used to access the Web, and this is the same in many developing countries. TV sets are also following this trend. Recent developments in the TV industry clearly show the convergence between television and the Web. Web users can watch TV programs on their desktops while TV sets can be used to access Web sites. The digital television technology is borrowing more and more techniques from the Web, such as XML, for instance. The automotive industry is also developing embedded devices that provide access to the Web. The Web is now ubiquitous and all sorts of devices with very different capabilities are involved in Web access.

Simultaneously, these devices are using new kinds of networks, ranging from personal networks, such as Bluetooth, to the global Internet. In the broad range of communication technologies, wireless and mobile networks (UMTS, WiFi) are taking an increasing part. Their specific features make a big change from the traditional wired Internet and have a strong impact on the way information is exchanged over the Web.

It is commonly accepted that the audience of the Web has reached a billion users in 2006, mainly in the northern hemisphere. Analysts now predict that half of the world population will be connected by 2015. This means that in the next few years the web will reach new parts of the world and consequently its audience will increase in diversity.

2.2. Document Adaptation

The increasing diversity of information, devices, networks and users makes the original scheme of the Web inefficient. The usual model of a single Web page designed for a large color screen accessed through a high speed network with a powerful computer does not work any more. Some information providers face this problem by developing their contents into different versions, each one suited to a specific context of use. Another approach is to create information in a single, universal format and to adapt it automatically to the environment where it is delivered.

The WAM project-team works along the second approach. It aims at developing models, methods, formats, languages that allow content to be adapted freely to the context in which it is actually used. In this approach, no restriction is put on the type of information that has to be adapted; multimedia information is considered with the broad diversity of media that are now commonplace on the Web.

Content adaptation is not something that comes into play at the last moment, when information is delivered to the client. To enable efficient adaptation, the original information must present some features that make adaptation easier or even possible at all. This means that the production methods should also be involved in the whole process of content adaptation. The WAM project-team is especially interested in authoring tools for the Web, with the perspective of creating multimedia documents that ease adaptation and improve device independence. Several editors are currently under development. LimSee3 is dedicated to the production of multimedia documents where time and synchronization play a key role. Amaya addresses multi-namespace XML documents containing text, mathematics, animated graphics and using style sheets. Tools for manipulating spatialized sound in multimedia documents, including games on cell phones, are also under development.

2.3. XML Processing

It is clear that a major means to adapt documents is to transform them according to the actual context where they are used. The project-team focuses on structured documents represented as XML structures. Regarding transformations, the objective is to characterize the theoretical and practical tools needed for efficient transforming XML structures, and to develop models, formalisms and algorithms that are necessary for transformation languages.

A strong motivation for this research on transformations is adaptive multimedia, but transformation of XML documents and data has actually a broader range of applications. Transformations are ubiquitous in the processing of structured information on the Web, ranging from formatting to re-purposing and life-cycle management. Actually, XML transformations are considered as a key paradigm for document processing.

2.4. Highlights of the Year

An important milestone was achieved this year for our research on XML processing, more precisely on static analysis of XML programs. Important results (see section 5.1) were published in three different venues [1], [7], [6], highlighting the impact of this work for different communities (web, data bases, programming languages). This was confirmed by an award for Pierre Genevès' PhD. thesis defended at the end of last year.

3. Scientific Foundations

3.1. Transformations and XML Processing

Keywords: *XML structure transformations*, *XPath*, *automata*, *document models*, *document transformations*, *logic*, *modal logic*, *path expressions*, *transformation languages*.

Participants: Everardo Bárcenas Patiño, Pierre Genevès, Nabil Layaïda.

Structure transformation is a specific domain that can be approached following different abstraction levels with respect to programming specifications. The lowest level is based on general purpose languages, such as Python or Java, associated with dedicated libraries and toolkits that implement a standard structure manipulation API, typically the DOM. At the other end of the spectrum, there are dedicated languages, such as XSLT, which abstract over data and control complexity through a tree-based data model and a powerful execution model. Our research follows the later approach.

Some properties are expected from specialized languages in order to help solving the most common problems: expressiveness, verifiability, efficiency, modularity, reusability, scalability, succinctness, correctness, etc. These properties are studied using the fundamental connection between language theory, mathematical logic, structured languages and query languages. Most of our theoretical work follows this approach.

The goal of the research published so far in the literature is limited to establishing new theoretical properties and complexity bounds. Our research differs in that we seek, in addition to these goals, efficient implementation techniques and concrete design that may be directly applied to XML systems. We also consider that some properties are of particular importance for XML structure transformations, namely:

- *Type checking*: The types we consider are structural constraints over documents expressed in formalisms such as DTD, XML Schema or Relax-NG. Few techniques are able to exploit typing information of the input or output documents to provide type-safe transformations. In this domain, algorithmic advances have led to the creation of research languages, such as XDuce, based on efficient containment of regular tree types. However, many challenges remain. While type-checking full XSLT or XQuery is theoretically impossible (these are Turing-complete languages), one challenge is to push the "decidability envelope" further for type-checking standard XML transformations. In particular, one of the most difficult issue is to find techniques for analyzing XPath queries with regular tree types. Another challenge is to provide effective algorithms usable in practice for realistic scenarios.
- *Efficiency:* Transformation languages may benefit from static analysis whenever performance is a concern. Static analysis techniques usually take advantage of robust formal semantics to help development of optimized compilers and runtimes.
- *Processing with restricted access policies*: Some applications may require particular policies for accessing XML data, that are incompatible with the current state of the art. For instance, many transformation languages assume that the whole structure to be transformed is available when the transformation process is run. In streaming applications however, the input data flow may be very large or even infinite and the transformation has to be performed on the fly, with bounded memory resources.

3.2. Adaptation

Keywords: *World Wide Web*, *adaptation*, *adaptive multimedia*, *authoring*, *device independence*, *document formats*, *multimedia*.

Participants: Sébastien Laborie, Nabil Layaïda.

The purpose of multimedia document adaptation on the Web is to customize content for the variety of devices and networks that are now sharing the Web with traditional desktop computers. As a result of these changes, the Web infrastructure needs to be reconsidered as a device-independent architecture, where information resources can be efficiently accessed with various types of devices and networks.

There is no general solution to the problem of device independence today. Most efforts are rather dedicated to the development of good practices. After some work on device-independent architectures, the WAM project-team now focuses on automatic content adaptation to make progress towards a solution.

With this approach, content would be ideally created or generated in a single universal format that could be delivered "as is" to any conceivable device. In practice this seems impossible, so the real techniques seek to minimize the number of variants needed, each variant being targeted at a range of devices as wide as possible. The variants have then to be adapted to the delivery context.

To transform multimedia documents for adaptation, one can rely on their semantics. The semantics considered here does not deal with the document content or meaning, but with the composition that is made explicit in a Web document:

- *Temporal semantics:* in what order and when should each piece of information be presented to the user.
- *Spatial semantics:* what are the relative positions of the document components on the display space.
- *Navigational semantics:* how are pieces of information related in the hypertext network.

With this approach, adaptation can be done in very general semantic terms, independently from the multimedia objects. This makes it also possible to abstract (model) existing content into a unified representation, and then to facilitate the adaptation process.

3.3. Multimedia Documents Authoring

Keywords: *authoring environments*, *editing*, *multimedia*, *structured editing*, *templates*.

Participants: Émilien Kia, Jacques Lemordant, Jan Mikáč, Vincent Quint, Cécile Roisin, Irène Vatton.

We are working on interactive authoring environments. Developing such environments is a challenging issue: structured multimedia documents are complex and the process of creating and updating them is complex too. Well-established paradigms for static office or technical documents do not work. The traditional WYSIWYG approach is useless in a context where the final form of the document (What You Get) is multiple and unknown at creation time. In addition, writing down the description of a document in some multimedia document language is extremely difficult, given the various levels of representation that are involved: content, logical structure, layout, style, synchronization, hypertext structure, navigation, dynamic behaviours, etc. New approaches are needed.

On the Web, multimedia documents are based on XML. They are considered through several types of structures: layout, time, navigation, animations. We are working on techniques that allow users to manipulate all these structures in homogeneous environments. The key idea is to present simultaneously several views of the document, each view showing a particular structure, and allowing the user to manipulate it directly and efficiently. As the various structures of a document are not independent from each other, these views are "synchronized" to reflect the consequences of every change in all views. The XML markup, although it can be accessed at any time, is handled by the tools, and the author does not have to worry about syntactical issues.

Two editing tools based on this concept are under development, Amaya and LimSee. In Amaya the emphasis is put on the integration of several XML vocabularies and associated technologies, and on direct interaction with the Web: users can edit remote documents in exactly the same way as local files. With LimSee the focus is on the time dimension of multimedia documents and their continuous media contents.

3.3.1. Authoring Models and Templates

Even with tools providing views for direct manipulation of various structures, the authoring task is often considered as too complex for most users because it requires a deep understanding of the semantics of the document format (e.g. the SMIL timing model, or the most advanced features of XHTML). We are therefore working on a new authoring model for multimedia documents that would provide a strong basis for creating generic or dedicated authoring tools with appropriate user-friendly GUI.

Our approach is first to first focus on the logical structure of the document while keeping some semantics of proven technologies such as SMIL. The second core idea is to tightly integrate template definitions in this document model: the template is itself a document constrained by a schema-like syntax. The continuum between templates and documents permits to edit templates generically as any other document and within the same environment. It also allows a more natural authoring process where documents can be progressively created from existing templates up to a final state where all place-holders are filled and all options are decided: during this process, the document status evolves between a pure template and a completed instance.

The LimSee3 model, based on these concepts, is under development and will provide a generic platform for the development of dedicated authoring tools.

The same kind of model is implemented in Amaya, where it should cover the very wide variety of Web documents: institutional pages, technical reports, slide shows, personal pages, address books, etc. The specific components of all these documents can be represented by the model in terms of lower-level languages such as XHTML. Authors can then handle documents in terms of these specific components while finally producing standard-conformant documents.

3.3.2. Editing Compound Documents through Databinding

Compound documents integrate pieces of information expressed in different document languages or formats (typically XML namespaces). When compounding by reference, the pieces are separate resources, each expressed in its own language, linked together by references. This allows different languages to work together, while implementations of the languages are kept separate. Compound documents can be authored by a variety of means and we are interested in multimedia-centric authoring tools that can create time-based, interactive content.

We study the creation of such authoring tools through databinding. We are considering databinding for compounding document formats by reference. Strongly typed references and access to different documents are well supported by the Eclipse Modeling Framework (EMF) schema compiler. This is a great advantage when it comes to building a graphical editing tool for compound documents and we have adopted it. We are specifically interested in problems related to events flow in a multi-document environment and how different languages should cooperate in rendering on the same screen and auditory space.

3.4. Multimedia Document Formats and Description

Keywords: *audio formats*, *digital library*, *document description*, *document formats*, *document models*, *document query*, *document templates*, *metadata*, *microformat*, *multimedia*.

Participants: Marc Caillet, Jacques Lemordant, Vincent Quint, Cécile Roisin, Irène Vatton.

Work on specific formats for audio has started recently in the project-team. More specifically, we are participating in an international initiative for creating a new format for interactive audio. Seven years after the completion of the I3DL2 guidelines (3D Audio Rendering), IAsig (Interactive Audio special interest group) has presented at the last GDC in Austin (September 2007) an introduction to the future iXMF standard (interactive eXtensible Music Format) for Interactive Audio. This format (C data structures) will complement I3DL2, but at this stage its use with I3DL2 is not clear and no reference implementation has been scheduled for the near future. iXMF could be used with other media like generative music, video, or graphics. Thanks to our knowledge of iXMF, we have defined an XML tiny version of iXMF (without scripting, but with integrated 3D audio rendering) for embedded systems, ready to work above OpenSL/ES (provisional specification September 2007). The corresponding audio engine has been implemented and tested over advanced audio Java API (JSR-234/JSR-135).

Regarding discrete media in multimedia documents, popular document languages such as XHTML can represent a very broad range of documents, because they contain very general elements that can be used in many different situations. This advantage comes at the price of a very low-level of representation. The concepts of microformats and semantic XHTML were developed to tackle this weakness. They add semantics to Web pages while taking advantage of the existing (X)HTML infrastructure. This approach enables new applications that can be deployed smoothly on the Web. But there is currently no way to describe rigorously this type of markup and authors of Web pages have very little help for creating and encoding semantic markup. A language that addresses these issues is developed and implemented in the WAM project-team. Called XTiger, its role is to specify semantically rich XML languages in terms of other, less expressive XML languages, such as XHTML.

Whereas document formats represent a multimedia document with all its internal structures, description languages describe a document from outside and provide metadata. In the area of description languages for multimedia documents, significant standardization efforts have been spent recently, such as MPEG-7 for instance, but the problem is not solved yet. Many application domains cannot cope with the description languages available today. We are working on this issue in cooperation with INA, the French national archive of broadcast radio and television. We are defining a structure description language for audio-visual documents, focusing on formal consistency to make descriptions usable in very large bases, such as archives of audio-visual documents. Typical applications of this work are producing a thematic audio-visual offer from archives, or producing the same interactive application on various media (CD-ROM, DVD, Web).

4. Software

4.1. Amaya

Participants: Émilien Kia, Irène Vatton.

Amaya is an open source Web editor, i.e. a tool used to create and update documents directly on the Web. Browsing features are seamlessly integrated with editing features in a uniform environment that allows users to save files locally and on remote servers as well. This follows the original vision of the Web as a space for collaboration and not just a one-way publishing medium.

Work on Amaya is a joint effort with W3C, which started to showcase Web technologies in a fully-featured Web client. The main motivation for developing Amaya was originally to provide a framework that can integrate many W3C technologies during their development, with the goal of demonstrating these technologies in action while taking advantage of their combination in a single, consistent environment.

Amaya started in 1996 as a HTML editor. Support for the creation and debugging of CSS style sheets was soon added. It was then extended to support XML and an increasing number of XML applications such as the XHTML family, MathML (for mathematical expressions), and SVG (for vector graphics). It now allows all those vocabularies to be edited simultaneously in compound documents. Amaya includes a collaborative annotation application based on the Resource Description Framework (RDF), XLink, and XPointer.

Now that a number of document languages are implemented in the editor, developments focus on accessibility and usability. The latest extensions are oriented towards robustness, completeness and ease of use. An important work item was completed in 2007 that consisted in a completely redesigned user interface, to make the manipulation of structured documents as easy as word processing.

Many contributions are received from several external developers and have to be coordinated with the project-team. They concern localization in various languages, including eastern languages, tests and adaptations to various platforms. Other contributions provide improvements and new features.

The early prototype of the templating feature enabled by the XTiger language (see section 3.4) was replaced this year by a strong implementation offering all features defined in the language through a convenient user interface. This development is part of our contribution to the Palette project (see section 7.2.1).

Two public releases were made in 2007, in February and July.

4.2. LimSee3

Participants: Jan Mikáč, Cécile Roisin.

LimSee3 is a new generation open source multimedia authoring tool developed in the context of the European Project Palette (see section 7.2.1). It aims at flexibility and easiness of use through extensive use of document templates. LimSee3 developments benefit from the project-team's experience acquired with LimSee2, an already well-established SMIL editor.

Existing multimedia authoring tools can be classified in two general categories:

- **General purpose tools** make it possible to edit various kinds of multimedia documents and allow authors to precisely manipulate the underlying structures. Such tools are indeed very powerful, yet they remain exceedingly complex and require special skills and serious training to be used efficiently. LimSee2 fits in this category.
- **Dedicated tools** are tailored for some particular domain or document type. They are easily accessible to casual users, thanks to their simplified approach to document authoring. Their main advantage lies in the simplicity and automation of some treatments, but users often find themselves trapped in a rigid framework that imposes hard limitations. In addition, they have to use multiple tools to manipulate different types of documents.

Taking a different perspective, LimSee3 brings multimedia authoring at the reach of non-expert users while allowing very different types of documents to be produced. The main idea is to provide template-based authoring tools while keeping rich composition capabilities and smooth adaptability. Based on the semantics of multimedia objects, LimSee3 allows authors to work in their own terms. With the integration of templates, users are guided in the production of sensible multimedia documents. Different templates allow authors to produce different types of documents.

As opposed to LimSee2, which sticks to the SMIL language, LimSee3 is language-independent. It is based on a component-oriented document model integrating homogeneously logical, time and spatial structures in a language-neutral way (see section 3.3.1). Templates are defined as constraints on these structures. Based on this logical structuring of multimedia documents, LimSee3 can generate different representations of the same document, in different languages or formats.

5. New Results

5.1. Static Analysis of XPath Queries

Work on the static analysis of XML programs was continued in 2007. In particular, the logical approach for processing XPath queries was developed, and we have published the first experimental reports on the actual cost of checking containment of XPath expressions using weak monadic second-order logic of two successors [1].

Significant progress was achieved on our work concerning the design and implementation of a new logic adapted for reasoning on XML trees. We have proven the decidability and the optimal complexity of a new modal logic for trees. This logic offers the best balance known between expressivity and complexity for decidability in order to reason over finite trees. It is as expressive as monadic second-order logic whereas it is much more efficient (its satisfiability is shown decidable in time complexity $2^{O(n)}$ with respect to the size n of a formula).

We have designed an efficient algorithm, based on symbolic techniques (BDDs) for testing satisfiability of the logic. We have implemented the logical solver as well as compilers for translating XPath queries and regular tree types into the logic [7], [6]. The system has been successfully experimented with some XML decision problems such as containment, satisfiability, and overlap of XPath queries, in the presence (or absence) of regular tree type constraints such as real-world DTDs from the W3C. The advantage of the approach is that the system is very effective in practice and allows solving a large class of problems that could not be addressed before.

5.2. Content Adaptation

The multiplication of mobile terminals for viewing multimedia documents requires the adaptation of document specifications to the terminal capabilities. We proposed a semantic approach to multimedia document adaptation which was temporally defined with regards to the Allen algebra of relations. This framework was then extended to the spatial dimension of multimedia documents and for the SMIL format in particular. It allows to find automatically a qualitative spatial representation that computes a set of adaptation solutions. A new metric was introduced this year in order to sort the solutions according to the distance from the initial document representation. The overall adaptation process is evaluated according to two criteria: expressiveness and computational performance. A tradeoff between the two is then proposed with a specific spatial representation that yields good results in practice [8].

5.3. Multimedia Authoring

Techniques for editing structured multimedia documents constitute the backbone of the Amaya and LimSee3 authoring tools. Recent work carried out by the WAM project-team in this area was published in 2007.

Work on Amaya has focused this year on three topics: user interface, templates, and style. Innovative web applications offer additional opportunities to exploit web documents, but authoring tools available today do not help users to produce the extra information needed by these applications. The main objective of the recent developments in Amaya is to support new advances in document formats without making the authoring task more complex. This is achieved through an improved, configurable user interface (new work started on this at the end of the year) and template-based authoring. The XTiger language created in the project-team is used to represent templates that can capture fine details of document structures. A contextual editing mechanism based on templates was developed for guiding authors in generating semantically richer documents [11]. For a long time, Amaya has provided support for creating, updating, and debugging style sheets for structured documents. This feature was significantly improved this year and its various aspects were finally presented in [10].

Work on LimSee3 is driven by the requirements from communities of practice as analyzed in the Palette European Project (see section 7.2.1). One way of providing technological support for communities of teachers is to help participants to produce, structure and share information. As this information becomes more and more multimedia in nature, the challenge is to build multimedia authoring and publishing tools that meet requirements of the community. These requirements were analyzed and a multimedia authoring model was presented in [2] as well as LimSee3, the generic platform on which specific community-oriented authoring tools can be built.

We have in particular worked with the ePrep community of teachers to address their needs in preparing and sharing course material. The authoring tool built with LimSee3 for this community offers two templates that have been specified in a participatory design approach involving one teacher and one ergonomist. The first template allows a teacher to easily gather multimedia data necessary for a lesson, the second one to synchronize these data with live content shot during the lesson (audio and/or video) and to enrich the whole with additional information such as web links. The resulting multimedia documents are intended for a repository shared between teachers from different French-speaking countries.

We have also studied and compared two approaches for the generation of different representations of the same multimedia document (SMIL, XHTML+javascript, MPEG4, etc.): a data-driven approach (using an intermediate XML format and XSLT transformations) and a process-oriented approach (using an abstract translator and code specifically added for each target format). This work performed by Bao Duc Le from IFI [14] is used in LimSee3 for generating multimedia documents both in SMIL and in XHTML+Javascript. The latter has followed an approach similar to the one recently proposed by W3C with Timesheets.

A prototype editor to be used by audio designers has been built as an Eclipse plugin using EMF databinding technology. Its user interface is close to that of well-know audio design system like FMOD, and consequently can be used by people not aware of XML technologies. The next step is to study the semi-automatic generation of an application-specific auditioning tool, a possibility offered by the similarity between our Interactive Audio format and the SVG tiny format (see section 3.4).

5.4. Document Formats and Description

A new version of the XTiger language [11], created in the project-team in 2006, was defined to take into account recent experiments, in particular those carried out in the Palette project. The main goal of these changes was to relax some constraints considered too strong and to make the language easier to use by template designers.

The XML format for Interactive Audio, whose design started last year, was defined as a serialization format of a specific audio API for mobiles (JSR-234 and JSR-135). Consequently, it was based on an XML Schema reflecting the hierarchy of types of these APIs [3]. To evaluate this format, we have built an Interactive Audio engine (soundtrack manager) which was tested with different kinds of applications: video games for mobiles and interactive outdoor sound landscapes [9]. This IA engine has a SMIL based scheduler, supports transitions between audio chunks, and can accept parametrized external events together with internal events. The experience acquired in using this format in real applications was a strong motivation for developing it further as a full language for Interactive Audio, by embedding more elements from the SMIL time and animation modules, and a defs/use mechanism to create instances of audio cues. The format, based on a Relax-NG schema, is now closer to the SVG tiny graphical format; this is important to learn it more easily.

Work on multimedia content description has followed three main directions, in cooperation with INA:

- The implementation of FDL (Feria Description Language) was extended with an inference system for the subsumption relation between descriptor classes [4]. FDL can express descriptions of audiovisual contents using types that are defined as temporally constrained aggregations of descriptor classes. Aggregations are constrained with disjunctions of Allen relations that are augmented with cardinalities and time parameters. These temporal aggregation types must comply with engineering needs. In particular, the specialization relation between descriptor classes must be defined. FDL classification structures together with associated operations are implemented within an expert system whose purpose is to help developers to classify their own classes.
- Development of four applications collectively called JAM! (Jouons Avec le Misanthrope!) based on the the corpus of six different recorded performances of the play. The objective is to demonstrate the expressivity and usefulness of FDL descriptors in multimedia applications, in particular thanks to the classification structures.

  The JAM! Dual Players application considers two performances in parallel and can play acts and scenes of both recordings synchronously. The relationships between descriptors make it possible to synchronize and navigate the play at different levels.

  The JAM! Play Synthesizer application is used to create a new performance of the play by choosing for each character an actor from one of the six recordings. When creating this virtual performance, new descriptors are generated for it from the descriptors of the real performances (segmenting by acts, scenes, line, actor).

The JAM! Analyzer application plays a recording and, for each verse, it displays the text of the play and phonetic information about the pronunciation of the actors, highlighting the differences with the original text.

The JAM! Rhymes Seeker application allows the user to choose a rhyme and to see all the pairs of verses that use that rhyme. The user can then navigate the performance based on these verses.

- Development and support of the Feria framework that aims at providing all the services required for the implementation of new applications at INA. The effort was put this year on the development of an event manager and user interface components. Feria is being used not only for the development of JAM! but also for other applications at INA, such as Infomagic and VideoTexte.

6. Contracts and Grants with Industry

WAM collaborates with INA on description languages for multimedia content (M. Caillet's PhD.)

7. Other Grants and Activities

7.1. National Grants and Collaborations

WAM participates in the **Web intelligence** project supported by the Rhône-Alpes region.

7.2. European Initiatives

7.2.1. Palette

Participants: Jan Mikáč, Vincent Quint, Cécile Roisin, Irène Vatton.

Palette (Pedagogically sustained Adaptive Learning through the Exploitation of Tacit and Explicit knowledge) is a European IST FP-6 Integrated Project. It aims at developing an extensible set of innovative, interoperable and standard-based services that enhance the learning process in communities of practice. Services are validated through various pedagogical scenarios fostering the emergence of new learning practices that remove barriers for the exploitation of mental models, knowledge resources and competences of individuals inside and outside communities.

The main contributions of the WAM project-team concern document models and authoring tools. More specifically, templating mechanisms are designed, developed and experimented in the context of communities of practice. These developments and experiments are based both on Amaya (see section 4.1) and LimSee3 (see section 4.2).

7.3. International Initiatives

WAM contributes to the Urakawa project with NRCD (National Rehabilitation Center for Persons with Disabilities, Japan), CWI (The Netherlands), and the DAISY Consortium (Digital Accessible Information SYstems). This software project aims at providing a multimedia authoring toolkit for designing content that is fully accessible to persons with disabilities.

The Amaya Web editor is developed jointly with W3C. The software is distributed by W3C.

8. Dissemination

8.1. Leadership within Scientific Community

Vincent Quint was co-chairing the W3C Technical Architecture Group (TAG) with Tim Berners-Lee until March 2007. He is also a member of the W3C Advisory Committee. Nabil Layaïda is a member of the W3C Synchronized Multimedia working group and is the editor of several chapters of the SMIL standard.

Cécile Roisin is a member of AS95 Time in digital documents and a member of the Scientific Advisory Board of the Palette FP6 project.

Jacques Lemordant is a member of IASIG (Interactive Audio Special Interest Group).

Agnès Guerraz is a member of the International Society for Haptics ISFH.

Pierre Genevès received the 2007 EADS foundation Ph.D. award in the area of Sciences and Technologies of Information and Communication.

8.2. Conferences, Meetings and Tutorial Organization

Cécile Roisin is a member of the steering committee of the ACM Symposium on Document Engineering.

Vincent Quint is on the steering committee of the H2PTM conference series.

8.3. Teaching

Pierre Genevès and Nabil Layaïda give Master lectures on XML technologies and formal foundations at UJF (University of Grenoble).

Cécile Roisin teaches XML Technologies at INSA, Department of Telecommunication (3rd year), Lyon.

Jacques Lemordant teaches XML Technologies at the L3 level of MIAGE (UJF, Grenoble), on Multimedia Technologies at the M1 level of RICM (Polytech, Grenoble) and Web Technology at the M2 level of IICAO (UJF, Grenoble).

Agnès Guerraz teaches XML query languages for XML databases (XPath and XQuery) at the fourth year of ESISAR/INPG Valence.

8.4. Conference and Workshop Committees, Invited Conferences

Members of the WAM project-team were on the following program committees or editorial boards: Document numérique, ACM Symposium on Document Engineering DocEng2007, Hypertextes-Hypermédia H2PTM, International Workshop on Semantically Aware Document Processing and Indexing SADPI, WebMedia 2007, TEL-CoPs'07.

N. Layaïda et C. Roisin served as editors of the special issue of Document numérique on document adaptation.

Members of the WAM project-team have served as reviewers for the following journals in 2007: TOIS (ACM Transactions on Information Systems), TOIT (ACM Transactions on Internet Technology), TKDE (IEEE Transactions on Knowledge and Data Engineering), IEEE Pervasive Computing, IPL (Information Processing Letters), PLAN-X (Programming Language Techniques for XML, an ACM SIGPLAN Workshop).

Members of the WAM project-team have participated in the following conferences: ICDT 2007, POPL 2007, PLAN-X 2007, PLDI 2007, SADPI, DocEng2007, IC 2007, ICMC 2007, CIDE 10, WebMedia 2007, Lyon GDC, QFirst.

Marc Caillet was invited to give a demo of the JAM! applications during the national seminar "Les Technologies du Sonore" organized by Ministère de l'Éducation Nationale, GRM and IRCAM (14 June).

V. Quint gave invited talks at CIDE 10 and WebMedia 2007.

Members of the WAM project-team gave several seminars: C. Roisin at IRIT, Toulouse (7 June), V. Quint at Loria, Nancy (21 November), N. Layaïda and P. Genevès at university of Fribourg, Switzerland (6 December).

9. Bibliography

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[5] M. CAILLET, J. CARRIVE, C. ROISIN, F. YVON. *Engineering Multimedia Applications on the basis of Multi-Structured Descriptions of Audiovisual Contents*, in "Proceedings of the 2007 International Workshop on Semantically Aware Document Processing andIindexing", M. NANARD, P. KING (editors), ACM Press, May 2007, p. 31-40, http://hal.inria.fr/inria-00189340.

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Internal Reports

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