



Document	Brochures				
Milestone	M5.4	Deliverable	D26	Source	The Open Group and all partners
Distribution	European Commission				
Document history					
Version	Remarks			Date	
1.0	Second set of brochures and updates to first set			20/11/2006	
1.1	Brochures for additional projects			10/01/2007	
2.0	Formatted and edited			19/01/2007	
2.1	Final version			25/01/2007	

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1 Executive Summary

This deliverable provides a final set of 11 brochures each presenting a case study resulting from the selected projects supported by COPRAS. Substantial progress has been made by each project towards their standardization objectives and these important experiences are documented and shared with other projects and prospective organisations anticipating proposal submission.

This deliverable includes 3 case studies from an initial set from IST Call 1 projects provided early in the project and a further 8 case studies from projects in IST Call 1, Call 2 and Call 5. The following material used together with the information package and the generic material provides a comprehensive promotional package for the results COPRAS has achieved and is tailor-made to the specific audiences of organizations considering or already implementing IST projects.

The following IST projects collaborated with COPRAS in preparing the case studies. Five of the projects are addressing standardization as part of three separate clusters each involving 4 projects, in the Strategic Objectives as indicated in the following table:

Project	Strategic Objective	Instrument	Subject
GANDALF	2.3.1.3	STREP	Standardization in combined wireless and wireline technologies
TALK	2.3.1.6	STREP	Standardization of Multimodal Dialogue Context Formats
ENTHRONE	2.3.1.8	IP	Standardization in technologies for the audio-visual chain
MediaNet	2.3.1.8	IP	Standards that ease exchange of Digital and Audio-Video Content
TEAHA	2.3.1.8	STREP	Interconnecting standards for home appliances and audio-visual applications
Telcert	2.3.1.12	STREP	Standards for interoperability of eLearning systems
UNFOLD	2.3.1.12	CA	Standardization in eLearning technology for Europe
HIJA	2.3.2.5	STREP	New programming standard for safety-critical embedded systems
POLYMNIA	2.3.2.7	STREP	Improving personalized content detection in audio-visual standards
EUAIN	2.3.2.10	CA	Standards for accessibility of digital information for disabled citizens
CWE cluster	2.5.9	IP	Standardization of a Reference Architecture for Collaborative Work

The actions described in each of the 11 brochures outline the steps towards standardization taken by the projects as described in the tailored ‘Standards Action Plan’. These have been prepared in collaboration with COPRAS and each project to meet their standardization objectives. These Standards Action Plans lay out the relevant information concerning the target standardization bodies, the various assistance COPRAS will provide, and the expected actions of the selected projects. The Standards Action Plan represents the understanding between COPRAS and the selected projects concerning the collaborative steps to establish the interface with and successful adoption by standards bodies of the project research results and are ongoing.

The COPRAS project has utilised the experiences gained from collaboration with the selected IST projects in implementing the Standards Action Plans and in documenting their experiences in the case studies provided in this deliverable to identify best practices, which have been reflected in revisions to the Generic Materials.

Standardization in technologies for the audio-visual chain

Introduction

The ENTHRONE project has worked in the area of technologies for *Networked Audio-visual Systems and Home Platforms* (NAVSHP) in the European 6th Framework Programme during 2004 and 2005. The project has researched solutions for improving consumer's access to multimedia content by developing an integrated management solution harmonizing the functionality of the individual components in the audio-visual distribution chain.

ENTHRONE was established to develop or improve multimedia technologies for:

- Quality of Service (QoS) management
- Content management & protection
- Definition of metadata

The project deliverables facilitate managing an end-to-end QoS architecture over heterogeneous networks, thus improving seamless access to a variety of audio-visual services for customers, delivered through a wide range of devices.

Standardization challenges

ENTHRONE was faced with a significant standardization challenge as the desired widespread adoption of the technologies developed in the project

largely depend on the project being able to use a number of standardization resources and tools. These include compliance testing and labelling, integration of components and standards, and the ability to test interoperability, consistency and reliability between resources.

Moreover, commercial feasibility of the solutions ENTHRONE provides requires business models that enable various industry actors to collaborate and benefit on a mutual basis, which must be based on industry standards. Consequently, the project has made considerable contributions to improving the current European and International efforts for the establishment of standards in the technology areas the project is addressing, and to having these contributions adopted as widely as possible.

Standardization environment for the audio-visual content delivery chain

The number of standardization areas and standards organizations ENTHRONE addressed is significant. There are many different aspects of multimedia content management protection and distribution that must be dealt with within ongoing consensus processes across a wide range of different standards organizations. The diversity of these organisations is illustrated in the figure below.



Standardization Path

In order to strengthen its standardization activities, ENTHRONE decided to cooperate in the development of a Standardization Action Plan within a cluster of projects in the NAVSHP area, in parallel to developing its own strategy towards standardization. Within this clustered approach, ENTHRONE would be able to better structure its steps towards standardization deliverables and benefit from additional resources by coordinating actions in dissemination. In the context of the Standardization Action Plan, action steps concentrated on the development and implementation of a deployment model for an Integrated Management Supervisor.

Step 1: Descriptive phrase

ENTHRONE provides a proof of concept for the Integrated Management Supervisor concept by presenting a use case scenario with system requirements addressing the complete audio-visual delivery chain, while at the same time presenting the functional architecture for the ENTHRONE system.

Step 2: Descriptive phrase

ENTHRONE implements an MPEG-21 Integrated Management Supervisor deployment model, providing an overview of the use case model containing the use cases that are considered most important from the architectural point of view, thus providing the foundation for the Integrated Management Supervisor model.

Step 3: Submission to standardization

ENTHRONE delivers an Integrated Management Supervisor design specification proposal to ISO/IEC JTC1/SC29 WG11 (MPEG), based on the implementations described in Step 2. This will allow demonstration of the levels of compatibility brought by MPEG-21.

Interim results

At an early stage in the project, ENTHRONE presented the definition and description of the Integrated Management Supervisor architecture based on the use cases most relevant for the development of this architecture to the ISO/IEC Working Group. It provided an initial design description of the individual Management Supervisor components and demonstrated how these components operate together. Subsequently, in order to verify the architecture that

was developed, ENTHRONE defined several deployment models that may be implemented at a later point in time. Later in the project, ENTHRONE presented a Proof of Concept for the Integrated Management Supervisor, describing a prototype implementation of the Integrated Management Supervisor architecture specified earlier by the project, and illustrating the use of the MPEG-21 framework for ensuring end-to-end QoS. In the description, the workings of the different Integrated Management Supervisor subsystems is explained, showing their interactions and specific usage in view of ENTHRONE's overall objectives.

Representatives from several ENTHRONE consortium partners have been participating in several different standardization processes throughout the first two years of the project. Among these has also been a continuous effort towards passing the specifications related to the Integrated Management Supervisor concept through the relevant ISO processes. Tangible results in this area are foreseen for the project's second period of activities in the 2006-2007 timeframe.

Key Learning Points

Insights gained from the experiences of ENTHRONE that might help other projects include the following:

- ENTHRONE allocated a substantial amount of resources to standards related activities, and participated in many different standardization processes. This put the project in a good starting position to pass its essential deliverables through standardization as planned.
- Experience shows that synchronizing a research project's standards activities with ongoing standardization processes requires permanent attention, specifically because more time and resources than originally expected may be required for communicating the market requirements for the proposed specifications, and for building the required constituency to support it.
- Even within the project itself, interdependencies between deliverables may occur that initially were not anticipated, but appear to be relevant where standardization is concerned. When projects are on a tight schedule, this may eventually lead to abandoning or downgrading standardization goals.

Standardization in combined wireless and wireline technologies

Introduction

GANDALF has been working in the area of *Broadband for All* in the European 6th Framework Programme and aims at demonstrating the simultaneous provision of Gigabit per second data rates to both wireline and wireless access nodes through research and development of a novel optical feeder. The optical feeder architecture makes it possible to remotely feed heterogeneous (wireline and wireless) access nodes and allows for a significant cost reduction with regard to other approaches while alleviating the bandwidth requirements at the transmitter end and simplifying the electronics at both transmitting and receiving ends. For the access nodes, low-cost optoelectronic technologies have been investigated within the project.

The proposed link configuration is compliant with core network technologies such as DWDM and optical packet switching. The offered bandwidth allows the provision of multi-service and multi-band applications satisfying future requirements of access networks to cope with the expected evolution of user and application requirements.

One of the main targets of GANDALF is to identify ongoing standards that employ modulation formats that are suitable to be deployed at both required frequency bands, or to provide prospects that allow the heterogeneous functionality the project will deliver. As pairs of standards/technologies are identified, their

simultaneous provision of required frequencies and interoperability are demonstrated both in a laboratory platform, as well as in a small field trial.

Standardization Challenge

The standardization bodies that related to the GANDALF project research and technologies were identified as EuroDOCSIS and the AT Digital Working Group of ETSI. The EuroDOCSIS standard is one of the dominant end-user broadband access techniques. Extension of this well-understood and robust technique for future wireless access capabilities was identified as a goal, in order to fulfil new network requirements. In addition, and at a later stage the project would also like to contribute to the ETSI TC BRAN specification on dual frequency band scenarios in WiMAX and HIPERACCESS systems. Standardization issues that were considered within the project include the following:

- Redefinition of the DOCSIS modulation formats
- Extension of error-correction and equalization may be required to address Quality of Service
- Extension of the standard descriptions of radio issues (radiated powers, antennas, etc)
- Modifications of the MAC layer to enable simultaneous operation in two frequency bands.



Standardization Path

ETSI has been identified as the relevant standardization body for GANDALF, and in particular the work within ETSI technical bodies: AT and BRAN. In order for GANDALF to establish a relationship with the ETSI technical bodies, the *Standards Making Process* governed by the ETSI Directives needed to be followed, which is defined by:

- ETSI Statutes
- ETSI Rules of Procedure
- ETSI Board Powers and Functions, and Working Procedures
- ETSI Technical Working Procedures

This includes the following principles, which were considered by GANDALF in its actions towards standardization:

- The Chairman of a Technical Body is responsible for the overall management, its working groups and its work programme.
- Representatives of full and associate ETSI members can participate in the work, while representatives of non-members may participate on an "exceptional and temporary" basis, if the Chairman agrees.
- Each Technical Body establishes and maintains a work programme, consisting of work items and a work item is approved by the Technical Body and then formally adopted by the whole membership.
- Most of the technical work is done via electronic means and working groups also arrange physical meetings with a usual frequency of 2 - 6 meetings per year.
- Decisions in a Technical Body are taken either by consensus or by a weighted vote – where a proposition passes if at least 71% of the votes cast are in favour.
- The Technical Body approves the output of work items as an ETSI Deliverable. In the case of ETSI Technical Specifications and ETSI Technical Reports, the Technical Body also adopts the deliverable for publication.

Interim results

ETSI TC AT declared an interest in the GANDALF project results during a first meeting. E-mail discussions between GANDALF and ETSI TC AT Chairman were arranged and these resulted in an invitation for

GANDALF to attend the next ETSI TC AT meeting in late 2005. At the same time, the possibility to contribute to the ETSI TC BRAN was also explored by GANDALF. The attendance of the GANDALF project at the next BRAN Plenary meeting was also successfully arranged with the ETSI BRAN Chairman and the ETSI BRAN Technical Officer.

GANDALF attended an ETSI BRAN meeting and submitted the contribution: "Wireline and wireless DOCSIS access networks employing radio-over-fibre fed access nodes". In this contribution a radio-over-fiber access network architecture for simultaneously feeding hybrid access nodes for wireless DOCSIS and wireline DOCSIS access networks was presented.

Key Learning Points

The ETSI BRAN feedback to the project was not very positive regarding the possible participation of GANDALF representatives to standardization activities. The conclusion was that as DOCSIS was already standardised ETSI does not need to standardise anything further as the view was that whatever GANDALF provides should be compliant with the spectrum regulation. However, GANDALF received from ETSI BRAN the recommendation to contact CEPT regarding this issue and that lead to more positive feedback from an ETSI member to participate in a CEPT working group dealing with standards coexistence in the same frequency band. The project has followed this new path. The learning point being that some investment in time is often required to identify fruitful paths towards standardization. While specific groupings may not be able to assist, the interactions are still valuable in identifying alternative paths.

GANDALF representatives also attended an ETSI AT meeting. This time the feedback was positive. The AT chairman suggested that GANDALF produce a Technical Report if the full committee agrees to create a new work item in wireless DOCSIS. Afterwards, if the work item is created, the AT grouping would encourage the project to participate in standardization activities in the subject area, and to contribute periodically. GANDALF is now in discussions with four ETSI members as required to support the new Working Item in accordance to the ETSI rules, and expects to get approval to proceed. The learning point has been that often several paths must be identified and followed in order for projects to achieve standardization objectives.

Standardization in eLearning Technology for Europe

Introduction

For some years there was a widely held view that the first generation of open eLearning standards, while valuable, had limited eLearning to a relatively simple, single learner, 'deliver-and-test' approach. A significant step forward was marked by the publication in January 2003 of the Learning Design specification from the IMS organisation, which was intended to enable flexible and more sophisticated pedagogical approaches to eLearning.

Government agencies, researchers, and commercial organisations can and do promote standards, and the coordination of these interests is often the determining factor in whether a new specification becomes a widely adopted global standard. It's within this context the UNFOLD project was conceived to promote and coordinate the adoption, adaptation, implementation and use of IMS Learning Design and related specifications.

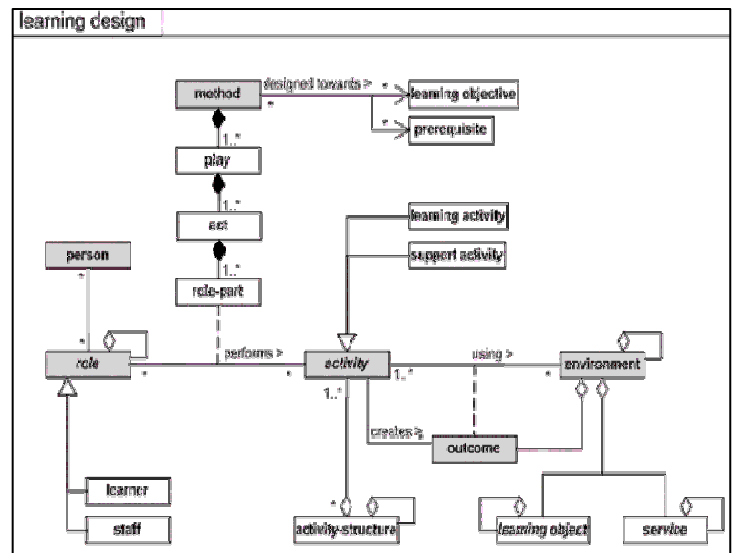
Standardization Challenge

The UNFOLD project has been working in the area of *Technology Enhanced Learning* in the European 6th Framework Programme since early 2004. The standardization challenge faced by the project was to build a community that was deeply involved with the Learning Design specification from IMS, so that it would be widely adopted and also evolve to meet the needs of Europe. Many different groups needed to be included if the Learning Design specification was to be accepted as a standard, but often these groups were not in contact. Researchers developing specifications do not usually work with authors of learning materials, and tool developers do not usually work with teachers and learners. The UNFOLD project determined that if progress was to be made in this key standard for eLearning in Europe, then information needed to flow between these disparate groups of people.

Learning Design Specification

The IMS Learning Design specification is used to describe learning scenarios. It allows these scenarios to be presented to learners online, and enables them to

be interoperable so they can be shared between systems. It can describe a wide variety of pedagogical models, or approaches to learning, including group work and collaborative learning. It describes how people perform activities using resources, including materials (e.g. books, articles, software programmes, pictures) and services (e.g. forums, chats, wiki's), and how these are coordinated into a learning flow.



Standardization Path

UNFOLD decided early in the project that the path towards greater adoption and evolution of the Learning Design specification needed to be based on a very collaborative approach that would involve organisations across Europe. The path chosen was to work closely with other projects within the *Technology Enhanced Learning* programme, and to build a broader community of interested organisations that would share experiences in utilising the specification, and become an important constituency in its adoption and evolution. A set of action steps was identified for the project.

Step 1: Establishing communities

To accelerate the adoption and to shape the evolution of the specification, communities of practice were established involving researchers, tool developers,

learning designers and teachers to use and evaluate the Learning Design specification.

Step 2: Identify and aggregate needs

Each of the communities of practice came together both in workshops and online forums to share their experiences, and address common issues regarding the Learning Design specification and supporting tools. The project facilitated the exchange of information and collected and addressed specific needs.

Step 3: Influence the evolution of the specification

The needs and issues identified within the communities of practice were documented and presented within IMS. Some of these needs have been proposed as extensions to the Learning Design specification, others as complimentary specifications for IMS to develop to support further interoperability of eLearning systems.

Collaboration in Research Clusters

UNFOLD was one of several eLearning projects funded and launched by the European Commission in 2004. Several of the other projects also utilise the Learning Design specification in their research. The ELeGI project addressing eLearning across GRID based architectures, and the iClass project addressing innovative eLearning pedagogies for K-12 students, collaborated with UNFOLD in evaluating the Learning Design specification. The PROCLEAR Network of Excellence also played an important role in broadening the reach of UNFOLD in building communities of practice and addressing technology areas. The TELCERT project has worked on application profiles and conformance tests for Learning Design based systems, which will be delivered in 2006. Verification of conformance is expected to increase interoperability and accelerate the global adoption of the Learning Design specification and future extensions.

Interim results

The work within UNFOLD has led to the number of 'Units of Learning' produced with the Learning Design specification going from near zero in 2004, to the hundreds by the end of 2005. This increase in use of the specification is encouraging, and reflects the success of UNFOLD in providing a platform for coordinating development of tools, demonstrating them, and providing leadership in the evolution of the specification. Over the course of the project UNFOLD has organised a large number of events, including:

- 6 Community of Practice meetings and 10 workshops across Europe
- 3 seminars in collaboration with other organisations

During these events people presented their work to each other, were trained to use the newly developed tools, tested the interoperability of tools, and informed each other about new plans and extensions to the Learning Design specification.

Key Learning Points

Insights gained from the experiences of UNFOLD that might help other projects include the following:

- The time required to build a constituency in support of a standard was underestimated. A key element that accelerated the work to establish the communities was the availability about midway through the project of tools that utilised the specification. It was at this milestone when true collaboration became possible as the communities of developers and learners could evaluate first-hand the specification.
- The fact that the first tools that utilised the specification were open source avoided many issues for the project. Fragmentation of the standard through proprietary interpretations has been avoided and the open source approach has encouraged further research and recommendations by organisations in Europe who can readily access current state-of-the-art.
- Constituency building was successful because people outside of the project were willing to invest their own resources to participate. The Learning Design specification addressed a real and identifiable need for those involved in eLearning. This motivated involvement, which increased the resources for evaluating and deploying the Learning Design specification by orders of magnitude beyond those within UNFOLD.
- Having partners in UNFOLD that were involved in the development of the Learning Design specification was a key factor in the project success. The UNFOLD project provided a European forum where other European projects and researchers could discuss and address issues and clarifications concerning the Learning Design specification. This deep involvement of UNFOLD partners in IMS gave confidence to European organisations that their interests were being represented in the IMS standards process.

New programming standard for safety-critical embedded systems

Introduction

Demand for greater intelligence and higher integrity in real-time components is increasing in the devices we depend on every day. As these embedded systems become increasingly ubiquitous, it's essential that there be an architecture neutral platform that allows components to be designed and to operate as high-integrity systems utilizing a broad range of hardware architectures.

The project has created a new real-time middleware platform that supports the development of architecturally neutral, high-integrity real-time systems (ANRTS), addressing both hard and soft application timing constraints and designed for safety-critical as well as business-critical and ambient intelligence applications, while delivering the platform flexibility inherent to Java™ based systems.

The HIJA environment specifically supports the development of ANRTS applications for safety-critical systems that must be verified as functionally correct. These applications can be deployed in a variety of operating environments and meet the needs of users and authorities requiring applications to be certified performing correctly.

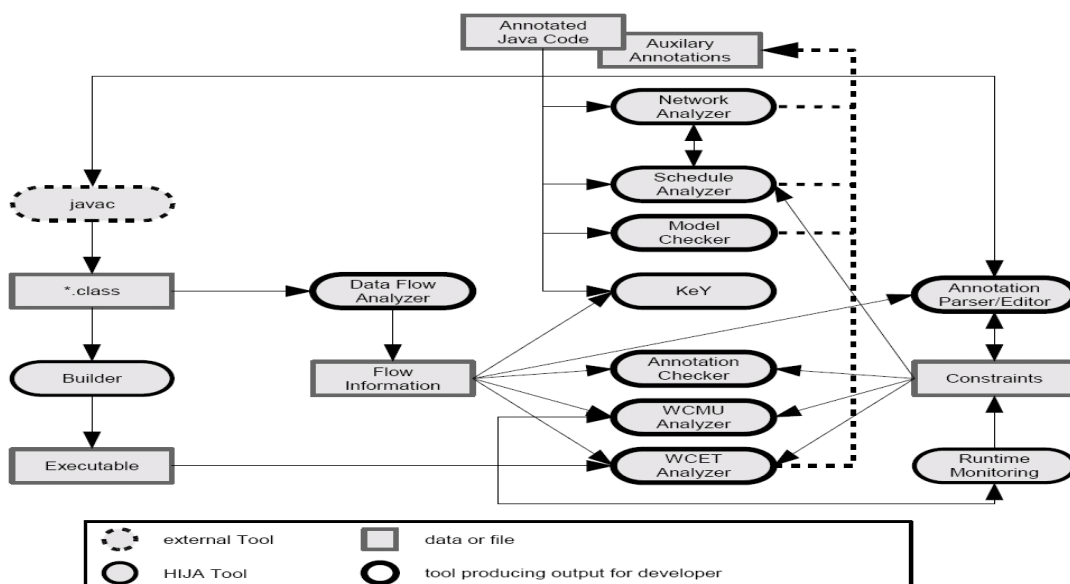
Standardization Challenge

The HIJA project was focused in the area of *Embedded*

Systems under the European 6th Framework Programme. The project faced the standardization challenge of developing new features and revisions to the well-established standard Java programming language that would enable a new generation of real-time safety-critical systems for applications including avionics, medical, energy, and transportation. One of the project research goals was to provide a framework that maintains the advantages of Java including portability, interoperability, object orientated design, and access to a large tool and library base, while providing a revised programming language reference that would allow Java based applications to be formally certified by government authorities for the most demanding safety-critical systems.

Standardization Path

The HIJA project included specific tasks to address standardization and in particular to participate in the Java Community Process programme, which establishes the formal specifications and revisions to the Java programming language. The Java Community Process is an open, participative process to develop and revise the Java technology specifications, reference implementations, and test suites. It involves over 700 members and seeks to foster the evolution of the Java programming platform in cooperation with the international Java developer community. A set of action steps was identified for the HIJA project to utilise the



existing infrastructure of the Java Community Process to standardize HIJA project results.

Step 1: Participate in ongoing standardization processes

From the start of the project the HIJA partners were active within the Java Community Process and used their participation to become both familiar with the standardization processes and to establish contacts and interact with developers as well as large end-users of embedded systems technologies for safety-critical systems.

Step 2: Understand existing features and validate proposed changes

The project invested resources to fully understand the features already implemented within the existing Java standards and to explore every possibility of supporting safety-critical requirements without any changes to existing specifications. Consultations with others outside of the HIJA project were used to validate amongst the Java development community that no techniques or workarounds to address safety-critical requirements using existing standard were overlooked, and the identified requirements of safety-critical systems were common to multiple industries.

Step 3: Build constituency for revisions

The project recognised that Java was a well-established standard and that changes might be resisted unless there was clear industry needs and new opportunities for the Java standard to be even more widely adopted. The project built a constituency of support for revisions to the standard by creating awareness of Java as a new and promising development environment for safety-critical real-time systems, while at the same highlighting the new requirements and implied changes needed to make Java genuinely suited for these new types of applications.

Step 4: Establish technical consensus for revisions

Demand for revisions to the Java language supporting safety-critical systems would not necessarily mean HIJA project results being adopted as standard unless the HIJA project could demonstrate the project results were the best technical solutions. The project established a team of experts to work within the Java development and user community to discuss and evaluate technical alternatives and to demonstrate the revisions from the project were the best technical choice and aligned with established Java principles.

Standardization results

The HIJA project has been successful in creating a new working group within the Java Community Process programme that includes HIJA project partners and other organisations from around the world interested in Java for safety-critical embedded systems. The new group known as the JSR 302 has voted to adopt the HIJA project results as the basis for a new safety-critical standard for the Java programming language that is expected to receive formal approval within the Java Community Process in 2007. The availability of a new industry standard specification is expected to accelerate the take-up of the real-time Java tools and technologies developed within the HIJA project.

Key Learning Points

The experiences and insights gained by the HIJA partners that may be of use to other projects include the following:

- Initiate the standardization actions early in the project. The HIJA project needed to work within ongoing standardization processes and some time was needed to synchronise the project schedules with the activities of the standards organisation. Waiting until later in the project would have eliminated the opportunity of making significant progress towards standardization while the project was operational.
- Provide sufficient resources to address technical issues that might arise during the standardization process. Several competing alternatives were submitted as part of the selection and consensus process and substantial resources were needed to understand and document the advantages provided by the HIJA project results.
- Include multiple project partners in standards making process. The different roles and perspectives of the partners involved created greater motivation for the need to revise the existing standard and greater support for the solutions being proposed by the project.
- Invest in collaborating with organisations involved in standards outside of the project consortium. The external validation of the HIJA technical proposals and additional inputs received not only helped in strengthening the technical specifications and achieving success in standardization, but they also improved the technical results developed by the HIJA project and expanded their applicability to a broader range of applications.

Standards that ease exchange of digital and audio-video content

Introduction

MediaNet, a consortium uniting many companies from various segments of the European audio-visual industry, set out to develop open architectures for the delivery of digital content and easing cooperation between the players in the delivery chain such as content owners, service providers, network operators and consumer equipment manufacturers. The project's aim has been to take away the obstacles currently complicating the exchange of digital media and audio-visual goods while at the same time protecting investments made by providers and consumers.

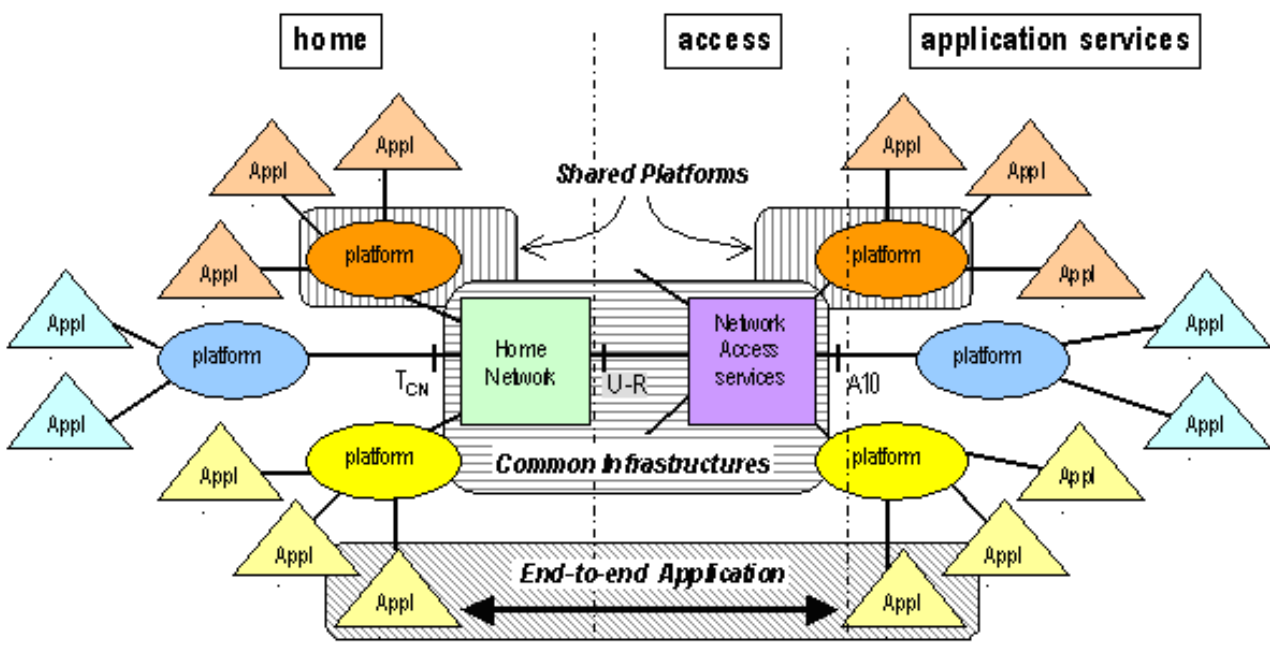
MediaNet developed an open architecture model enabling the deployment of a myriad of multimedia applications from various providers and coexisting across common access and home networking infrastructures and platforms. This architecture model, shown in the figure below, allowed the project to identify the key architecture reference points as well as the main blocking points along the delivery chain enabling MediaNet and its consortium partners to develop technologies and deploy related standards activities addressing these challenges. In doing so, the project covers access as well as home networks, storage as well as distribution of digital media, and middleware as well as content protection issues.

Standardization Challenge

There are still many technical issues to be addressed with respect to the delivery of digital content. Among these are:

- Improving resource & device management
- Achieving end-to-end quality of service
- Addressing the possibility of security leakages
- Providing transparency of responsibility of Stakeholders along the service provisioning chain

These issues however have to be addressed against the background of increased convergence between broadcasting and IP based delivery of digital content and as a consequence these issues require effort in several standardization areas. The prime challenge MediaNet identified in this respect was the delivery of a complete service provider agnostic reference architecture for digital services deliver since such a framework was missing in the digital media industry and standards environment. Such an architecture could be certified by implementing reference scenarios, matching it with the Digital Video Broadcasting (DVB) project's concepts for digital content delivery, applying these scenarios in a traditional broadcast environment as well as in a content on demand environment, and using broadband IP networks.



Standardization Path

MediaNet developed a Standardization Action Plan which outlined its intention to develop a reference architecture as well as reference use cases demonstrating the need to define standard solutions for key interface points in the digital audio-visual delivery chain. In this perspective, MediaNet envisaged submitting its results – or parts thereof – to standards processes in the DSL Forum, ETSI, UPnP, the IETF, and DLNA. In addition, possibilities for making submissions to DVB, OMA and ISO were also identified.

Following the work completed on the reference architecture, MediaNet contributed directly as a project to IETF, focusing on the standardization and management of interfaces between different layers of the architecture. MediaNet also contributed to the work in the DSL Forum, specifically focusing on Video over IP. Further to the standards activity deployed directly by the project, MediaNet's consortium partners individually contributed to processes in UPnP, DLNA and IEEE.

MediaNet has demonstrated that an IP project is capable of making a relatively large number of substantial contributions to standardization within a relatively short time frame. However, as not all opportunities could be foreseen during the first months of project activities, additional standardization activity beyond MediaNet's own 27-month horizon was also deployed in the ETSI TISPAN committee.

The activities MediaNet deployed in ETSI addressed IPTV functionality planned for the second release of the TISPAN architecture, a process scheduled for the 2006-2007 time frame. The overlap between this period and MediaNet operations was short (only 3 months), but nevertheless enough to begin studying the utilization of MediaNet's results in the TISPAN specifications.

MediaNet presented its IPTV related concepts during the first quarter of 2006, initiating further and deeper involvement of some of its consortium partners, studying more deeply the interactions between on the one hand the MediaNet vision and results (typically DVB-IP related work), and on the other hand the emerging TISPAN IPTV specification work.

Key Learning Points

During the course of its activities and experiences in progressing standardization objectives, MediaNet encountered the following issues that may help future

projects planning their activities, or may improve the overall research/standards interfacing process:

- The outcome of standardization activities can sometimes be considerably improved through projects sharing their research results, or even when project work together to jointly target specific standardization processes. Exchanging information between projects can however be complicated sometimes due to the result of the confidential nature of some project work. Consequently, projects' individual and combined standardization results could be upgraded through specific arrangements addressing the exchange of information and results for the purpose of making coordinated submissions to standardization processes.
- Embedding standardization targets more firmly into a project's work plan helps to safeguard standardization activity from falling apart when a project's lifespan ends and increases the likelihood that standardization success will be achieved. Lack of financial and human resources after the project contract complicates completing all the standardization activity originally planned.
- Convergent processes challenge the relationship between standards organizations and industry bodies, and potentially complicate the definition of frameworks, architectures and concepts that bridge traditionally separate areas of technology. Synchronizing agendas between research and standardization, as well as a timely start to building constituencies is specifically important to the success of research/standards interfacing processes under these circumstances.
- Having a clear framework for standardization activities, specifically within larger projects, allows for better internal project coordination of standardization activities between the project itself and the individual consortium partners, consequently allowing for a more effective use of standardization resources, and better use of the projects results.
- Within a project's objectives, next to those aspects that match the standardization targets of individual consortium partners, there are also elements that are more easily pursued by the project as an entity itself. Consequently, interfacing between IST research and standards organizations could be improved by creating facilities allowing projects to participate directly in standardization activity, in addition to participating through their consortium partners.

Interconnecting standards for home appliances and audio-visual applications

Introduction

The European Application Home Alliance (TEAHA) project focused on networked home control applications and their interconnection to, and inter-working with, networked audio-visual applications. It set out to specify an open and secure home platform allowing interoperability between these different application segments in the home. Within this context, the project's aim was to develop technologies contributing to the seamless inter-working of the wide variety of low-end and high-end appliances found in a home environment, regardless of the networks these appliances use.

In this context, the project's research and innovation aim has been on an open middleware framework ensuring interoperability across heterogeneous networks, on low-cost RF components supporting this TEAHA middleware, on new network independent service discovery and security mechanisms, on low-cost power-line communication solutions, and on new residential gateway components.

Industrial deployment of the solutions the project developed was addressed through the validation of applications focusing on white goods control, on energy management, and on seamless integration with networked audio visual applications

The main goal for TEAHA's activities was to accelerate the development of networked products and services and to improve the environment for the promotion of these services through the various industrial sectors concerned, such as telecommunications, the audio-visual industry, and white & brown good equipment manufacturing.

Standardization challenges

One of the important goals for the project in the context of the availability and deployment of inter-working products and services has been to reinforce European competitiveness. This presented TEAHA with the challenge of providing open standards that would enable European industrial organisation to rapidly provide compliant applications and services.

Therefore, providing the necessary inter-working standards was identified as one of the main project goals and consequently a number of concrete standardization challenges relating to home gateways, home device communities, interoperability and taxonomies were defined.

The challenges included:

- Providing application profiles that are network independent;
- Integration of the TEAHA seamless inter-working approach into the OSGi (Open Services Gateway Initiative) framework;
- Defining profiles that allow for management of information exchange between applications in different clusters, i.e. application segments;
- Integrating security in existing service discovery protocols and defining an overall service discovery protocol.

the technology and standards pursued will contribute to more dependable home infrastructures and applications being developed, improving the security and privacy in the home environment, as well as trust in the knowledge society in general.



Standardization path

Standards bodies identified as primary interfacing targets for TEAHA's standardization objectives included the UPnP (Universal Plug 'n' Play) Forum, the Open Services Gateway initiative (OSGi) and the Home Gateway Initiative (HGI). In addition, the project set out to liaise with CECED, the European white goods appliance trade organization, and the relevant Technical Body in CENELEC (the European Electrotechnical Standards Committee), overseeing the developments in the Smart-House area.

Together with COPRAS, TEAHA developed a Standardization Action Plan, emphasizing the projects standardization challenges and pointing out the more concrete objectives, such as the contributions to a device taxonomy and contributions to an architecture for seamless inter-working between clusters and networked devices in a home environment. In this perspective, it envisaged submitting its results – or parts thereof – to organizations such as UPnP and OSGi. Also, cooperation with other FP6 projects in the audio-visual domain was foreseen, specifically focussing on the development of additional UPnP profiles.

During its lifespan, TEAHA developed a large number of activities to pursue its standardization objectives. It liaised with CENELEC, OSGi as well as with the UDEF (Universal Data Element Framework) Forum to discuss the possibilities for a generic device taxonomy.

In addition, it initiated discussions with other projects in the audio-visual domain, to jointly specify additional UPnP profiles that would ease inter-working between home networked appliances.

An assessment of TEAHA results in terms of their standardization potential led the project to make submissions and contributions to HGI, rather than to UPnP, as HGI was focusing on the aspects of requirements and architecture. Four contributions were made:

- A specification for a secure service discovery protocol
- Business clusters requirements
- Contribution on policy management
- A proposal to use UPnP to describe devices

The expectation is that the latter contribution will eventually lead to the necessary interfacing between HGI and UPnP.

Key Learning Points

During its standardization activities, TEAHA encountered a number of issues that could assist future projects or project consortia better planning their standards work. These may be taken into account by others when planning general measures aiming to improve the overall research/standards interfacing process.

- The perception whether technological developments are sufficiently mature in order for them to be submitted as standards can differ between various standards organizations, as well as between a project and the standards world in general. It is important to check with a targeted standards organization whether these perceptions match.
- In order to be able to make submissions to standardization, projects need to be represented in the targeted organizations. Usually this can be arranged through one of the project consortium partners, but – in case the relevant partner decides to abandon the project – a back-up scenario allowing a project also to carry out the standards work in direct communication with the targeted standards organization is sometimes necessary.
- Synchronizing a projects objectives and standardization intentions with the roadmap of a standards organization, as well as with the agenda of the individual project partners, is essential to the success of projects' standards work. This should preferably be done before standards processes are initiated, as a mismatch in either of these areas will make cooperation towards consensus based standards difficult.
- The specific problem addressed by TEAHA of seamless inter-working needed the setting-up of a discussion forum prior to standardisation. The reason is that stakeholders from different business clusters do not meet. This was one of the conclusions resulting from a TEAHA forum.
- The availability of the support of a project like COPRAS was very beneficial to the success of the projects standardization activities. It helped TEAHA focus on standards issues at an early point in time.

As a project usually does not have someone dedicated to the management of standards work, COPRAS support contributed not only to getting the right procedures in place enabling it to contribute to standards processes, but also to creating a common understanding among project partners on how this should be pursued.

Standardisation of multimodal dialogue context formats

Introduction

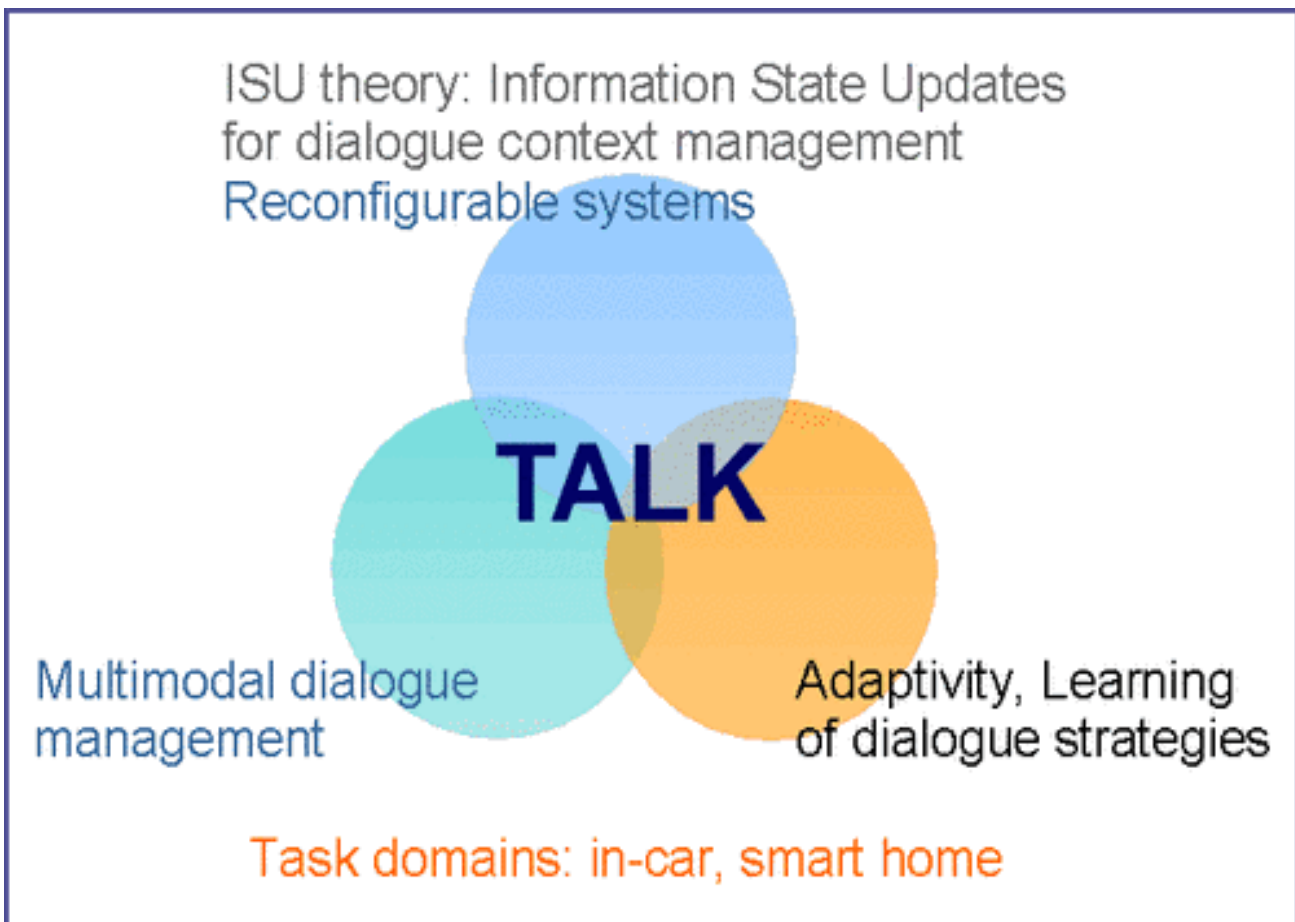
The EU project TALK focused on the development of new technologies for adaptive multimodal and multilingual human-computer dialogue systems. The aim was to make dialogue interfaces more conversational, robust, intuitive, and user-adaptive: TALK worked towards the long-term vision of users interacting naturally with devices and services, in the home or car, using speech, graphics, or a combination of the two.

Standardization challenges

Standards serve various purposes such as internationalisation or quality control. The primary goal of standardising dialogue context formats and dialogue annotation is to be able to create uniform corpora that can be shared among partners. This is especially important as data driven methods become more popular in dialogue design.

For example, researchers aim to learn a dialogue policy from dialogue state representations where the size of the state space increases exponentially with the number of state variables. To address this problem, one either needs to get more data, or keep the state space small enough for the learning problem to remain tractable. Both issues are closely related to the question of standardising the dialogue context.

The challenge is the representation of various aspects of the dialogue context. The analysis of the annotated data is supposed to feed into system development. A major concern here is that annotations, which are time-consuming and expensive, should be reusable for analyzing various phenomena, from the viewpoints of different theoretical models and/or concrete implementations. This is what motivates the interest in efforts aiming to define interoperable concepts for context representation. These types of interoperability issues represent an important area where standardization could provide substantial benefits.



Standardisation Path

There are several different standardisation initiatives touching on dialog corpora and dialog annotations. While the TALK project and the AMI Project are more based in the W3C Voice works using EMMA -mostly using XML dialects-, the LIRICS project pushes the current work in ISO TC 37 SC 3 & 4.

First step for TALK was to present their work to the Voice Working Group and Multimodal Interaction Working Group to get their attention and comments. The Groups were both very interested but both concluded that the work undertaken by TALK was too far ahead of their actual schedule to be accommodated directly by the Working Groups.

After preliminary discussions with involved stakeholders from industry and universities, the Standardization Action Plan identified a multitude of existing groups spreading over IETF, ETSI and ISO. The Plan suggested to have a Workshop, gathering the community of researchers working in the area of dialogue context. This workshop would determine whether there was enough agreement in the community to push the creation of a specification of an XML format for dialogue context.

Further, it would also determine whether there would be a possibility to bring the ISO branch and the XML branch back together on to some common ground. If such a common ground could be found, W3C would make a lightweight group called "Incubator" to allow for the creation of the specification or help TALK with further work in ISO.

Step 1: Identification of relevant formats

As a first action, TALK performed an analysis within the community of experts on dialogue annotation about the formats already used. It also identified several ongoing standardization activities, and determined to which extend these could be leveraged within the project.

Step 2: Identification of needs

Following these initial activities, TALK made an inventory within its own constituency on which parts of the work was relevant and appropriate for standardisation.

Step 3: Identification of stakeholders

By collecting the various dialogue annotation formats, TALK had automatically identified the relevant community on a global scale. Moreover, relevant stakeholders in the university community were already known to the long standing experts working within the

project. Further, Industry contacts were provided through coordination with the W3C Working Groups as well as with ISO TC 37 SC 3 & 4. This created a large overview of the state of the art in the area and the relevant actors.

Step 4: The Workshop

The Workshop that brought the relevant community together was organized in Edinburgh on 12 December 2005. It united all relevant actors interested in dialogue context formats. While participants agreed that the issues addressed and discussed were highly relevant from a scientific perspective a concrete agreement to team up and push forward a single format for dialogue context was not retained. However, a limited number of people still remained committed to continue to push for standardisation.

The Workshop therefore for the time being finalized the standardization activities developed by the TALK and AMI projects within the project's lifetime. However, additional initiatives may be developed in the future, when the W3C work on Voice and Multimodal would be a bit more advanced and come closer to the work on dialogue annotation.

Key Learning Points

The action steps towards standardization of a dialogue annotation format generated some experiences that could be relevant to other research projects plating their standards work as well.

- TALK had a really compelling case for standardisation as it would have allowed several communities to get more insight and research results by creating larger dialogue corpora, thus allowing all to share the benefits. However, other circumstances may cause barriers to unite a sufficiently large constituency around the standardization challenge, that is related to it.
- A compelling argument for standardisation can be sufficient to unite and motivate the relevant community to discuss standardization opportunities. However, timing is an important aspect in standardization processes, and under certain circumstances it may be necessary to take a step in between (i.e. going through an incubator-type process), rather than to pursue full blown standardization objectives.

Standards for interoperability of eLearning systems

Introduction

The goal of the TELCERT project was to introduce technology innovations in the tools and test systems that underpin conformance and certification of e-Learning tools and content as compliant to industry standards and specifications. These new tools promote interoperability and provide confidence that the elements of learning content or the learning management systems will work together by design. The end result the TELCERT project sought to achieve was a reduced need for expensive and time consuming adaptations and re-engineering of learning content and management systems.

The focus on interoperability for the project was motivated by the increased importance in reusing and combining various learning elements in different ways to meet diverse learning needs and to create more adaptable learning systems. This was seen as the key to realising economic benefits from better and more widely available education in developed and developing nations.

Standardization Challenge

At the heart of achieving interoperability is the ability to verify that learning content and management systems

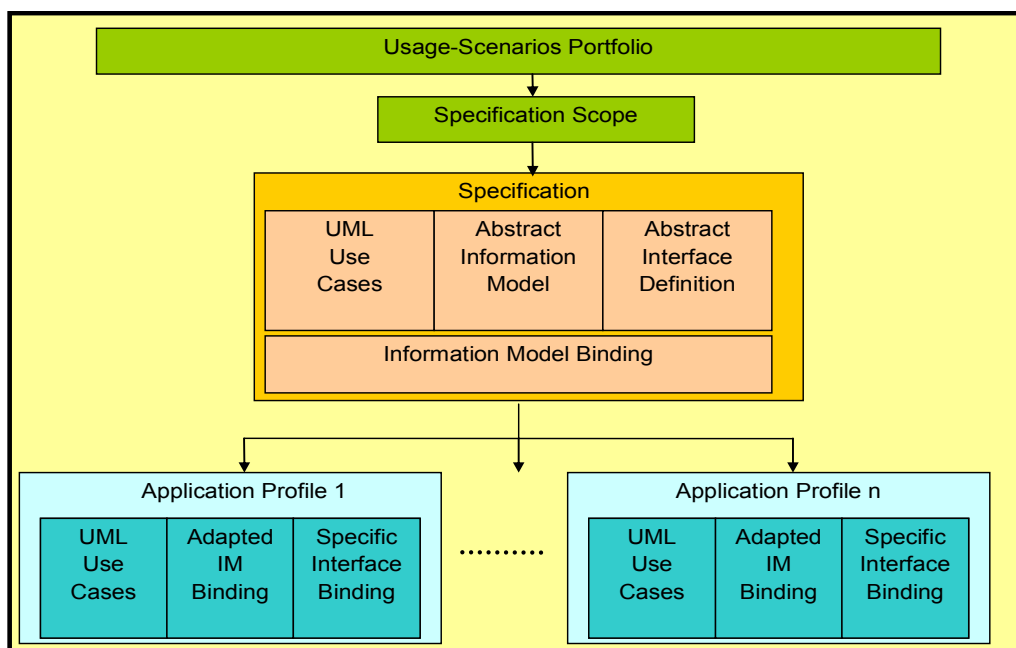
conform to standards and can interoperate through common interfaces and formats. The adoption of conformance and certification programmes for eLearning has been held back by two major technology barriers:

- Test systems have traditionally been custom designed, expensive to develop, and unable to accommodate the variety of learning standards and specifications and the differing needs of the various learning communities.
- Communities for learning define their requirements and variations to specifications in different ways.

It has therefore been impossible to design common testing tools without a consistent way to describe and accommodate these variations.

Standardization Path

The TELCERT Test System verifies that eLearning content conforms to the profiled specification and provides information for establishing product certification programmes. The system can be reconfigured automatically from any XML-based profile information. The IMS standards organisation provides many of the industry specifications used for eLearning today. TELCERT targeted the IMS specifications as



one eLearning standards that would be supported using the new tools and technologies developed within the project. The project followed a set of action steps leading to improvements to the existing IMS standards.

Step 1: Participate in ongoing standardization processes

The technologies developed within the project provided tools for certifying conformance to the IMS eLearning standards. It was therefore important that project partners be deeply involved within the IMS standardization processes in order to understand the intention of the specifications for which conformance technologies were being developed and to be able to provide an accurate representation of the specifications requirements in the project conformance tools.

Step 2: Understand existing features and validate standards usage

The project invested resources to fully understand how the various learning communities were using the IMS eLearning standards and the types of systems that were being prototyped and developed. The project partners participated in several learning communities workshops and worked closely with publishers to identify the most widely used features within the standards, as well as the elements of the specification that were essential in ensuring interoperability.

Step 3: Confirm consistency of existing standards

The project in developing the profiles and tools to verify IMS standards conformance gained a deep knowledge of the specifications and the various development paths and options provided for within the specifications. The IMS specifications were found to be largely consistent, however several areas were identified within the specifications where clarifications or a more precise text were needed in order to avoid different interpretations that would both prevent conformance checking and also give rise to the creation of incompatible content or systems that were intended to be compliant to the standard.

Step 4: Submit revisions or clarifications to improve existing standard

To enable the creation of conformance and certification programmes using TELCERT technologies, the project worked closely within the IMS organisation to address the areas within the specifications where clarifications were needed. This strengthened the specification and created greater opportunities for exploiting the project technologies.

Standardization results

The TELCERT project has created a set of tools that allow learning communities to localise international specifications for eLearning content and services, and enable publishers to create interoperable products. The work within the project required a deep analysis of existing IMS standards specifications for eLearning and in undertaking this process the project identified several areas where ambiguities existed in the specifications. These ambiguities would potentially create a situation where eLearning content or products had interpreted the specifications in different ways creating conflicts and preventing interoperability.

In order that the conformance and verification technologies developed within TELCERT could provide clear indications to users and publishers that eLearning content and systems were conformant to IMS standards and interoperable, the ambiguities within the specifications were brought to the attention of the IMS standards grouping and clarifications were suggested and agreed. This helped to strengthen the IMS specification by making it more precise, ensured greater interoperability of eLearning content and systems, while also creating further opportunities for TELCERT technologies to be utilised for industry conformance and certification programmes amongst different learning communities and regions.

Key Learning Points

The experiences and insights gained by the TELCERT partners that others in IST projects may find useful include the following:

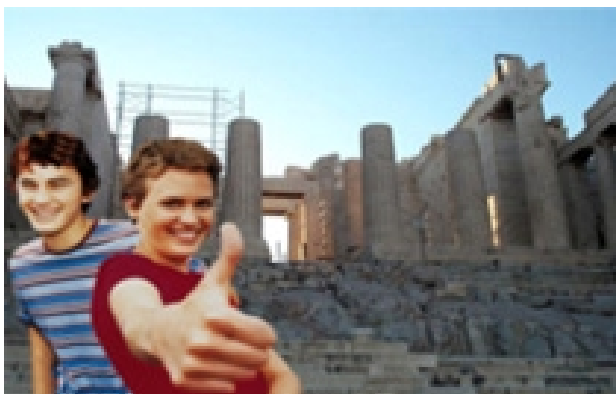
- Get involved early in the standardization processes of the standards bodies. The participation in various working groups requires some time to gain familiarity and to be able to operate at the same level of understanding as the existing working group members.
- Industry initiatives to be successful require momentum where there is sufficient interest and participation from different communities to sustain the establishment of a new programme. Participation in workshops and events to create awareness and demonstrate demand for interoperability and standardization is important.
- Work within the existing standards processes. Groupings have invested time in specifications and when changes are needed, it's better to work within the existing community than to fragment and create conflicts or unendorsed alternatives.

Improving personalized content detection in audio-visual standards

Introduction

The POLYMNIA project aims to develop an intelligent cross-media platform for personalised leisure and entertainment, where it focuses on thematic parks. The project set out to provide high quality and personalized souvenirs – in which the visitor will appear him- or herself as the real protagonist in a preset reality scenario – by tracking and recording them individually through a multiple-camera system. When a visitor enters the venue, he or she is registered into the POLYMNIA system that will capture the visitor's face and personal data, after which this can be combined with his or her preferences regarding the artificial digital content of augmented reality scenarios to be used for the production of the souvenir.

Moreover, POLYMNIA will develop an intelligent cross media platform, through which content is distributed to multiple remote users, accessing it for example through the Internet and their PC, allowing remotely located friends or family members to enjoy the experience as well. In order to arrange this, the visitor will be able to notify them through their terminal device of the web-cast tour, which is also enriched with artificial content. The final digital souvenir is produced when the visitor leaves the venue.



Standardization challenges

The results of POLYMNIA's work were expected to generate contributions in a number of technological areas, such as detection, localization and tracking of persons, real time content identification technologies,

digital content extraction, representation & description, and media access, retrieval & searching at different media platforms. Consequently, the project expected to provide significant contributions to the further development of audiovisual networking standards, such as MPEG-7 and MPEG-21, as well as additions to XML. Therefore, it approached standardization in a bi-directional way, by following the international standards so that the system and infrastructure developed by the project would be compatible with the current state of the art in standardization, and by subsequently submitting its research results generated through the project's activities, as well as solutions found to the problems encountered, to the relevant standards organizations.

Standardization path

Responding to the standardization challenge, POLYMNIA planned to address the following areas & issues:

Non-linear organization and Decomposition of Video Sequences: transmission of digital video in a cost effective and quality guaranteed manner over low bandwidth networks (e.g. the Internet) remains a challenging issue. Video information is represented in a linear way, which supports sequential play, but is not appropriate for interactive navigation of video information over networks. Furthermore, performing video queries is com-



plicated and efficient organization of large video archives presents challenges to most multimedia servers. For this reason new methods for efficient (non-linear) video content representation and summarization should also be implemented.

Spatio-temporal Representation of Visual Content using Hierarchical Graphs: it should be possible to indicate the spatial relationship of objects with their neighbours through a scheme. POLYMNIA aims at a content-scale decomposition scheme, which allows complicated image queries, that can be expressed at different description (resolution) levels.

Relevance feedback tools for personalized retrieval of visual content: relevance feedback is a necessary tool for many Content Based Image Retrieval (CBIR) architectures. Usually, relevance feedback schemes are distinguished into two different types of actions, either modifying the query originally issued by the user, or modifying the similarity measure used for ranking and retrieving image data in a CBIR system. POLYMNIA intends examine and evaluate the two approaches.

POLYMNIA set out to propose the new schemes to W3C consortium since the representation of the new tools will be XML-based. Thus, apart from the contribution to the MPEG-7 and MPEG-21, a simultaneous contribution to W3C consortium was planned to better and more effectively disseminate the POLYMNIA results.

Towards the end of its lifespan, POLYMNIA initiated processes that would allow it to make submissions as intended to processes in ISO/IEC through the national Greek standards organization ELOT, mainly focussing on Non-linear organization and Decomposition of Video Sequences.

In addition, with the support of COPRAS, it discussed options to make submissions in W3C as well, focussing on Non-linear organization and Decomposition of Video Sequences as well as on Spatio-temporal Representation of Visual Content using Hierarchical Graphs, and Relevance feedback tools for personalized retrieval of visual content.

In this respect, a number of Working Groups in W3C were identified as potential target constituencies, but at the end of the day it was decided to submit the contributions to the Semantic Web Deployment Working Group, focusing on the development of guidelines assist users of the Semantic Web in publishing data and vocabularies that describe data in the Semantic Web. A submission was made to the group early February 2007.

Key Learning Points

During the course of its standards work POLYMNIA encountered a number of issues that may help future projects in planning their activities, or may improve the overall research/standards interfacing process:

- Starting the process towards standardization of a project's results should be started at the earliest possible moment and preferably even before the actual start of a project. When combined with a strong determination to work towards standards, this offers the best guarantee that submissions can actually be made as planned, and the standardization gap between the end of a project's lifespan and the transformation of its deliverables into standards can be kept as small as possible.
- Finding the right standards organizations to work with, but specifically finding which standards are relevant to a project's activities takes a lot of time, and often leads to projects having to spend more of their resources on standardization than originally planned. This could be addressed, for example by having an entity or a project that could advise projects in this matter. COPRAS' support in arranging contacts with the relevant Working Groups has been quite helpful in this respect.
- Having consortium partners working in standards organizations can be an important pre-condition for being successful as a project in standards activities. However, ICT standardization is very diverse, and success is often only guaranteed if consortium partners have representatives in the same Technical Bodies or Working Groups that are targeted by the project.
- It could be beneficial to the success and result of standards activities, if – during the preparation of a project's technical Annex – advice could be made available indicating which contributions to existing standardization processes would be welcomed by standards organizations. This would make it easier to fine tune research towards standardization, and to build a constituency around it.
- Standards activities mostly require more time than a project has. Despite the fact that an early start of standards work may shorten the standardization gap, additional resources are necessary to continue and finalise standardization – and dissemination – activities beyond a project's lifespan.

Standardization of a reference architecture for collaborative work

Introduction

The goal of the European Commission programme for Collaborative Work is to develop next generation collaborative working environments, thereby increasing creativity and boosting innovation and productivity. These environments are intended to provide collaboration services that make possible the development of worker-centric, flexible, scalable and adaptable tools and applications. In doing so this will enable seamless and natural collaboration amongst a diversity of agents (humans, machines, etc) within distributed, knowledge-rich and virtualized working environments. An emphasis has also been placed on supporting professional virtual communities and nomadic personal access to knowledge.

the funded projects, and would provide greater confidence to European organisations considering investing in implementing new systems for collaborative work.

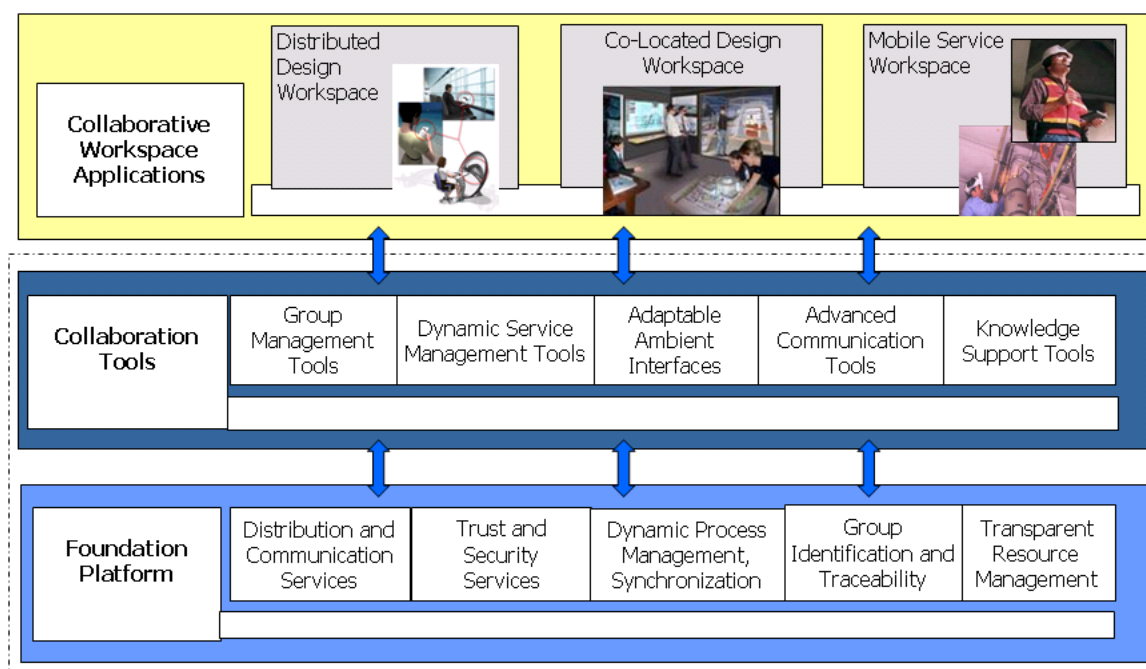
The creation of an industry recognised reference architecture became the joint challenge of four Integrated Projects funded by the European Commission. These four projects each address different aspects of collaborative work and are developing innovative technologies that support a wide range of workers and working environments, with each project addressing a different set of target industries or application domains. Through working together, the vision is to create a standard platform that supports the industries and application domains targeted by each project.

Standardization Challenge

The European Commission identified as a key objective within the Collaborative Working Environment programme the establishment of a common framework or reference architecture on which a new generation of collaborative tools and applications could be developed. A reference architecture would increase interoperability amongst systems, encourage re-use and sharing of common technologies developed within

Standardization Path

The initiative for standardization of a reference architecture for collaborative work involves two important elements. As there is no existing platform or framework the first element centres around coordinating the combined technical abilities amongst the partners within the four large Integrated Projects to define and agree the technical content of the reference architecture specifications. This is by no means a



simple task as there are numerous and sometimes conflicting requirements coming from the various industries and application users that each Integrated Project is targeting.

The second element of the standardization initiative involves establishing industry recognition of the new reference architecture as a *de facto* standard. The first step in this process is to obtain the endorsement of the more than 100 project partners that are participating in the four Integrated Projects, many of which are leading organisations in their industry. This, combined with dissemination actions, newsletter, conferences, workshops, training curricula, and other tasks already within the work programmes of the Integrated Projects should establish the new reference architecture as a recognised industry standard.

The final step will be the establishment of a grouping to move the reference architecture forward in order that it stays current with the needs of users and suppliers, and provides an open environment in which contributions from other projects and further research can be incorporated.

The EC Unit for Collaborative Work has been very innovative in their processes for launching the initiative to establish a reference architecture for collaborative work through implementing the following steps.

Step 1: Establish collaboration amongst projects during negotiations

Meetings have been organised amongst the Integrate Projects at the very start of negotiations in order that the vision of each project and underlying technologies was understood and the challenges faced in harmonising and specifying a common architecture were recognised.

Step 2: Include tasks for standardisation in project work programmes

Each of the four Integrated Projects have within their work programmes specific tasks identified for coordinating with the other projects in developing the common reference architecture. This changes the standardization emphasis from a dissemination activity to one that is integral to the research and development within the projects.

Step 3: Formally track project progress towards standardization

The European Commission has included work towards standardisation of the reference architecture as important topics for the initial six month project reviews

of each project. This highlights the importance of the initiative for the project partners and allows issues of coordination that might otherwise slow progress towards standardization to be addressed early.

Step 4: Publish a formal reference specification

The technical work of defining the reference architecture is more substantial than a typical IST project in that the deliverables are intended to be published in a way that enables easy take-up by industry. Additional effort is needed to describe the specifications, along with the technical, user and business requirements behind the design in order to build confidence in organisations outside the projects in using the architecture for their own applications.

Key Learning Points

The four Integrated Projects have only recently started their project contracts, but the experiences gained from the initiative of the European Commission to establish a reference architecture already provides important lessons that others should find useful:

- Encourage technical discussions amongst projects during the contract negotiations stage of a project. The understanding of what others intend to do helps in coordinating standardization actions and also in streamlining potentially overlapping research work.
- Build coordination of standardization actions across projects into the project work programmes as specific tasks. This will ensure resources are available for harmonising technical approaches and resolving conflicts prior to disseminating standards proposals.
- Make achievement of standards a specific objective within projects so as to ensure sufficient priority is placed on standardization as part of the research and development work. Many projects under estimate the technical work in adequately specifying standards.
- Establish common methods for defining specifications across projects. This will facilitate communications and streamline the harmonisation process, especially if the motivations, requirements or rationale are captured along with the technical descriptions.
- Utilise the industry position of project partners to build support for new standards and to encourage other organisations outside the project to take interest and to monitor project progress.

Standards for accessibility of digital information for disabled citizens

Introduction

Given the widespread adoption of ICT within the publishing industries, there is a general interest in the creation and provision of well-formatted digital documents. For those people who are dependent on accessible information, this interest is of central importance, and it is this convergence of interests that offers exciting opportunities for these different stakeholders.

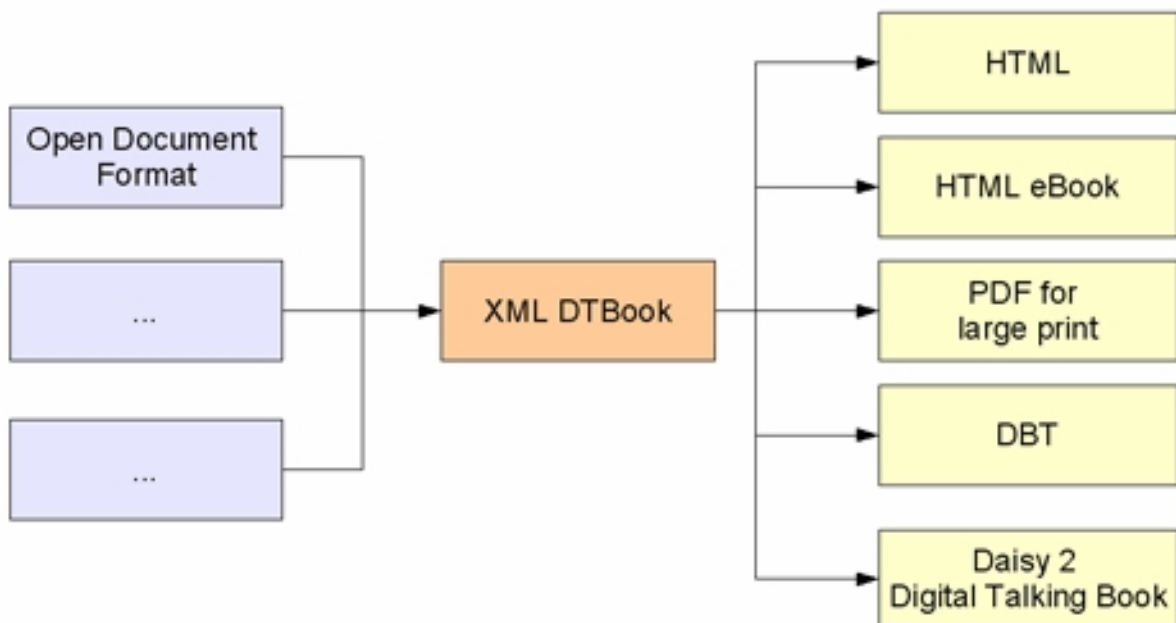
EUAIN, the European Accessibility Information Network focuses on improving the accessibility of digital information for disabled citizens. In this respect, it relies on the existence and the promotion of accessibility standards to prove that accessibility can be built into digital information from the first stage of production, and that 'Design For All' can be applied to emerging standards, so that all the features needed to grant accessibility to the final product are built into the system right from the beginning, instead of the traditional approach of adding those features later.

Standardization challenges

Standards are needed for many reasons, but probably the most relevant one is that they tell manufacturers how to make their products accessible in a detailed,

coherent way. However, the existence of standards though does not imply that accessibility will always be implemented in the same way and within the same standard, not all features may be considered equally essential. As a result of this, the application of the same standard can lead to a wide range of accessibility levels for the same product, making it fully accessible for some users and just slightly accessible for others. In addition, different standards may be developed for the same purpose and though they deliver the same level of accessibility they may not be compatible, leading to confusion among manufacturers and users.

The challenge therefore was to determine whether and how new standards and technologies for the provision of information in formats that are more accessible for everyone, could be created. Moreover, this process should not exclusively address the industrial requirements on accessibility, but also involve end-users and representative organisations. In addition, it was recognized that it would be important not to draft formal standardization documentation that lacks a connection with the real world. One of the challenges in the process therefore was to integrate practical implementations and business opportunities (i.e. the industry aspects) with a description and specification of community requirements in the area of document processing for ac-



cessibility (end-user aspects).

In conjunction with its standards activity, the EUAIN project aimed to provide an integrative accessibility framework in the form of a web portal with personalised interfaces, which will implement the findings of the standardization processes.

Standardization path

In order to achieve its standardization goals, EUAIN initiated a Workshop in CEN/ISSS on Accessible Document Processing (CEN/ISS WS/DPA). This workshop, that is a key activity for the EUAIN network, has three prime objectives:

1. To bring together all the players in the information provision and e-publishing chain in order to achieve the critical mass significantly to enhance the provision of accessible information at a European level
2. To provide guidelines on integrating accessibility components within the document management and publishing process rather than as just a specialised, additional service.
3. To raise awareness and stimulate the adoption at local, regional, national and European levels of the emerging formats and standards for the provision of accessible information and to find ways of ensuring that technological protection measures do not inadvertently impede legitimate access to information by people with print impairments

Taking into account these objectives, the more detailed targets are:

- delivering a systemic overview of standards for document processing for accessibility, and carry out a gap-analysis;
- providing reference documentation on accessible document processing, including Digital Rights Management, production and distribution,, from industrial requirements, end-users and representative organisations and provide a corresponding set of standards for this area;
- providing an overview of relevant European organisations, relevant best practices, and relevant scenarios;
- seek wider involvement and consensus of stakeholder communities;
- install a network of interested parties for ongoing support and further development.

The Workshop, that will work towards a CEN Workshop Agreement (CWA) was open to all interested parties

and will therefore increase the validation of the document as well as preparing a specification which is upwardly compatible to formal standardization either at European or International level.

Moreover, next to the development of requirements, specifications and possible standards, their integration into society was identified as an important aspect as well. This meant that the main stakeholders had to underwrite the importance of the activity and had to participate in the process, which essentially could be guaranteed through a CEN Workshop.

When holding the results of the Workshop so far against these objectives, and seeing that the level of participation went considerably beyond the membership of the EUAIN consortium itself, it should be concluded that the project well managed to achieve its goals, also demonstrating the success of the CEN Workshop approach.

Some 85 experts have registered as a Workshop participant. Workshop participants receive regular updates on the progress made and can comment on the drafts, either electronically and/or through participating in one of the Workshop's physical meetings.

Moreover, during the Workshop's lifespan, 6 Workshop meetings will be organized. This will guarantee optimization of the feed-back possibilities for all participants and stakeholder groups involved in the process. Workshop meetings were well attended with more than 20 participants on average during 2005 and 2006 and EUAIN's input has been instrumental in achieving agreement on the CWA and for expanding the network of experts, which was one of the Workshop's goals. Moreover, EUAIN consortium members delivered a substantial part of CWA.

Key Learning Points

The following conclusions can be drawn from the cooperation between EUAIN and the CEN/ISSS WS/DPA:

- The combination of a research project with a CEN Workshop has been a productive approach.
- It is nevertheless the case that while some Workshop participants are very enthusiastic and productive at meetings, it often proves to be difficult to obtain extended written contributions on a voluntary basis
- Embedding the standardization targets with related financial and human resources into the project's work plan seems necessary to ensure the drafting of the standardization deliverables.