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EPOCH

**Excellence in Processing Open
Cultural Heritage**

Network of Excellence

Information Society Technologies

**D.1.6 Periodic Activity Report for Period 2
(including Periodic Report on the distribution of the Community's contribution)**

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Dissemination Level		
PU	Public	
PP	Restricted to other programme participants (including the Commission Services)	
RE	Restricted to a group specified by the consortium (including the Commission Services)	
CO	Confidential, only for members of the consortium (including the Commission Services)	X

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Periodic Activity Report

Publishable Executive Summary

The overall objective of EPOCH is to improve interdisciplinary interaction at the interface between technology and the cultural heritage of human experience. EPOCH is targeted at increasing the effective use of technology at every stage of processing or potential processing of digital data concerned with cultural heritage, from field recording to public dissemination. EPOCH is committed to ensuring that these activities are carried out in sustainable enterprises, which must be viable in business terms even though many are not driven by a profit motive.

EPOCH's objectives are best served by making effective technology available as cheaply as possible (preferably freely available) and then using the technology in conjunction with cultural assets to produce sustainable and economically viable digital assets. Thus the consortium (which in technological terms is concerned primarily with the design of tools rather than the provision of digital content) does not seek to create a commercial market for the tools. This philosophy is encapsulated in the consortium agreement and is reflected in the Network's plans - the exploitation will happen because the knowledge is disseminated, not because of patent activity.

The Consortium comprises 83 partners, with another 11 accepted by the consortium and awaiting formal incorporation into the contract. These are listed below. The work is organised in four major work packages, including Management; Integrating Activities; Jointly Executed Research and: Spreading Excellence.

During the first year of its operation EPOCH has established much of the underpinning on which to build future development. The start of the second period was characterised by consultation and planning to move the consortium forward in the preparation of JPA2. The process of reaching communal agreement on directions for JPA2 produced a great deal of consolidation and shared planning. However the period proved administratively difficult, which has made maintaining impetus hard for the project leadership. The reasons for these difficulties can be, and have been, debated, but the project management has had to learn from the experience and adapt operational approaches. The fact remains that a process designed to produce an agreed JPA2 as a fully considered development of JPA1 was initiated in Month 8 and not formally agreed until over a year later. Just under half of this time was used for the widespread internal consultation and it is clear that this process is not repeatable on an annual basis in that form, given that the processes of getting agreement with the Commission will inevitably take at least some time.

The practical impact of these events has been an inevitable loss of momentum. Several key partners reported running out of pre-financed operating budgets for the project and that this was interfering with their ability to make progress. The project leadership has been re-energising the partnership over the last few months, and progress is again being made. However there has needed to be some prioritisation of the many activities needing effort with the result that some anticipated actions have not yet taken place. An example of this is the intention to elect researchers from project partners for membership of the Executive and Board of Directors. To accomplish this required an update from all partners of the researchers currently involved (including PhD students etc). The process of ensuring a complete set of returns in this exercise has taken a long time (in terms of reminders and elapsed time) meaning that the project was not yet been in a position to conduct full and fair elections before the current reporting rounds absorbed the availability of staff to support them.

EPOCH has continued with actions designed to help understand and enhance the relationships between SMEs and the world of cultural heritage and to assist policy makers in their understanding of the socio-economic impact and potential impact of investments in cultural heritage. The symposium held last July was reported as a success by participants and has resulted in publication of an EPOCH book of Proceedings. In view of this success EPOCH is planning another event for June this year to continue to synthesise a broader understanding of the issues and of the potential ways forward.

There has also been significant progress in establishing an infrastructure to support and empower the development of appropriate groupings of organisations (local authorities, SMEs, research centres) to establish and maintain a successful Cultural Heritage sector in particular geographic areas. The EPOCH

network of centres of expertise is being established and is growing rapidly. The process is being well received by participants who are putting significant resources into the development. A number of individual centres have also begun to establish clusters of engaged organisations and the enthusiasm for this process is such that the project plans to expand efforts in this area as one of the longer-term integration measures which is anticipated will be sustainable beyond the funded period of EPOCH.

The NEWTON projects commissioned inside the jointly executed research activity have progressed at different rates. Some groups have been able to ignore the administrative difficulties and progress with their work. Others have had to delay until the official acceptance of JPA2. The development of the common infrastructure, where individual groups were already in place from the first year of the project, has made progress within the teams. Such disruption as there has been has slowed the development of the standardised interfaces to the components of the common infrastructure rather than the individual components. However, real progress is now underway in developing the concept of the EPOCH “container” – a concept drawn from the standards world and designed to simplify the use digital artefacts with multiple tools.

The Project website has been redesigned (www.epoch-net.org) and provides information both for the public and for the consortium members. An extensive range of services is available to consortium members and the volume of data in the various digital asset libraries continues to expand. The on-line management tool has gone through several iterations and is now virtually ready to support the on-line acquisition of management data for Period 3. The decision was taken that historic data was needed to make the benefits of the on-line reporting obvious, but that the assimilation of that data into the new system could not be undertaken in parallel with the current reporting round.

Project partners continue to contribute to standards work, most notably in the adoption of CIDOC CRM for documentation and classification of collections. In addition the Ename Charter for communicating cultural heritage continues to make progress towards full formal adoption by ICOMOS. A growing challenge in the standards area is to address the relationship between CIDOC-CRM and systems based on the Dublin Core.

The Dublin Core has origins in the libraries field and has achieved significant market penetration as a convenient standardised mapping for traditional index systems. However CIDOC-CRM has been designed to encode specific characteristics of historic artefacts and offers significantly richer functionality which is in principle would support a range of more interesting applications. Adoption of CIDOC-CRM involves a recoding of existing collections, possibly with additional data being usefully acquired. EPOCH is developing tools to assist with this extra work and examining the limits for semi-automatic assimilation of collections’ information.

A comparison can be made with the development of the film industry where previously only live theatre was available. The initial films were commonly generated by recording theatrical performances. The potential to adopt a rather different approach, incorporating “on-location” sequences and close up’s for example, was realised and implemented over a period of time. A typical traditional index for an artefact might include a measure of size, e.g. “height 8cm”, which is useful but not the full documentation of an artefact. The potential with digital technologies is to adopt far more complete documentation which will support more complex applications. A scanned digital artefact includes information as to its height, but could also support examination in 3D over the internet or inclusion in a virtual environment reconstruction. To capture the digital artefact takes additional work, the cost of which needs to be assessed against the benefits.

On top of the technical issues surrounding the capture of additional information there are the issues of market penetration and critical mass. If a few organisations put resources into the richer datasets then they also achieve greater interoperability, but without critical mass the interoperability could turn into an isolated club. It is for this reason that the development of tools to assist in the classification of collections using CIDOC-CRM is important – it should help to significantly reduce assimilation costs.

At the same time the issue is very real – the MICHAEL project, recently initiated and involving national governments and important contributors from the museums sector, has adopted Dublin Core as the basis for creating interoperable catalogues. Addressing these issues is one of the biggest challenges facing EPOCH over the next period.

The inter-disciplinary discussions which characterise the wide debates in EPOCH mirror developments that are taking place in a number of places across the arts/sciences divide. An important role which EPOCH can have under the Research Agenda activity is to ensure that the concerns and priorities for the communities represented in EPOCH are properly represented in these broader debates.

The consortium has continued a number of programs designed to promote human resource development in support of the cultural heritage sector, implementing courses, bursary schemes, staff mobility opportunities and events, as well as a range of in-house and other publication activities. Staff mobility has increased based on a very low base. This growth is partly recognition of the level of collaboration being achieved as EPOCH develops more systemic integration of activities and organisations.

In conclusion the second period of EPOCH has been a balancing act of attempting to keep momentum going despite the administrative difficulties. Some potentially very powerful collaborations are developing and the project has used the collaborations to quantify some of the critical issues impeding interoperability of tools and data. A key factor is now to be able to maintain that momentum in the move to JPA3.

A second challenge in the coming period will be to strengthen the new partnerships and cooperations and establish any formal mechanisms that will help take EPOCH forward and build the integration required for a sustainable European Research Area for the intelligent use of technology in support of cultural heritage applications.

Consortium Membership

The Consortium Coordinator is the University of Brighton, UK, backed by a group of three other core partners – PIN srl – Servizi didattici e scientifici per l'Università di Firenze, Italy; Ename Center for Public Archaeology and Heritage Presentation, Belgium; and Katholieke Universiteit Leuven, Belgium;

The other partners in the consortium are: Technische Universitaet Graz, Austria; Technische Universitaet Wien, Austria; Leopold Franzens Universitaet Innsbruck, Austria; Instituut voor het Archeologisch Patrimonium, Belgium; Virtual and Augmented Reality Technologies NV, Belgium; Axell Communication srl, Belgium; New Bulgarian University, Bulgaria; Gastiburu SL, Spain; MAP - CNRS, France; Université de Toulon et de Var , France; Albert-Ludwigs-Universitaet Freiburg, Germany; Technische Universitaet Braunschweig-Institut fur Computergraphik, Germany; Fraunhofer Gesellschaft zur Forderung der Angewandten Forschung E.V., Germany; Rheinische Friedrich-Wilhelms Universität Bonn, Germany; University of Tübingen, Germany; Foundation of the Hellenic World, Greece; INTRACOM SA Hellenic Telecommunications and Electronics Industry, Greece; GeoAnalysis sa, Greece; Technical University of Crete , Greece; Synthesis & Research Ltd, Greece; Advanced Computer Systems A.C.S. – S.P.A., Italy; Politecnico di Milano, Italy; Alma Mater Studiorum - Università di Bologna, Italy; Università degli Studi di Genova, Italy; Ducati Sistemi S.P.A., Italy; Consiglio Nazionale Delle Ricerche, Italy; 4site srl, Italy; HeritageSolutions, Netherlands; Hogeschool van Utrecht, Netherlands; Universitetet i Oslo, Norway; Insitituto Polytecnico de Tomar, Portugal; Universitat Autònoma de Barcelona, Spain; Universitat de València. Estudi General, Spain; Universidad de Jaén, Spain; Diputación Provincial de Jaén, Spain; Universidad Politecnica de Madrid, Spain; The Interactive Institute II AB, Sweden; Karlstad University, Sweden; Eidgenossische Technische Hochschule Zurich, Switzerland; Université de Geneve, Switzerland; Ecole Polytechnique Fédérale de Lausanne, Switzerland; University of Kent, UK; University of York, UK; University of Bristol, UK; Brunel University, UK; University of East Anglia, UK; The University of Surrey, UK; The University of Warwick, UK; The University of Sussex, UK; Paveprime Ltd, UK; Planetek Italia S.R.L., Italy; Instituto Superior Tecnico, Portugal; Kungliga Tekniska Högskolan , Sweden; Oxford ArchDigital Ltd, UK; Istituto per i Beni Artistica, Culturali e Naturali della Regione Emilia Romagna, Italy; Archaeolingua Alapítvány, Hungary; The European Academy of Sciences and Arts, Austria; Institutul de Memorie Culturala, Romania; Ministerie van de Vlaamse Gemeenschap, Belgium; UniRel srl, Italy; Tekniska museet (National Museum of Science and Technology), Sweden; Stichting Bedrijfsregio Kop van Noord-Holland, Netherlands; Ciência Viva – Agência Nacional para a Cultura Científica e Tecnológica , Portugal; Georg-August-University Göttingen, Germany; Scientific Research Centre of the Slovenian Academy of Sciences and Arts, Slovenia; Rijksuniversiteit Groningen, Netherlands; Département des Recherches Archéologiques Subaquatiques et Sous-Marines, France; The University of Hull, UK; University of Patras, Greece; Imagination Computer Services GesmbH, Austria; Instituto Tecnológico de Informática, Spain; National Museums of Scotland, UK; University of Cape Town, South Africa; Culture, Heritage &

Development - International, Belgium; Conseil Général de la Côte d'Or (Parc Archéologique d'Alésia), France; Università della Svizzera Italiana (USI), Switzerland; Visual Acuity Limited, UK; Università degli Studi di Napoli - L'Orientale, Italy; European Association for Historic Towns and Regions , UK;

Section 1 – Project objectives and major achievements during the reporting period

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The following recommendations were made in the written report following the Review meeting held in November 2005. Each recommendation is followed by a brief description of how it has been taken up by the Consortium:

1. Case studies and end-user scenarios should be given greater focus.

Focus has been given to scenarios under Activity 3.3 Common Infrastructure in the Period 2 and there are plans to develop a specific strand of the Activity 4.2 Standards involving the development of the scenario case studies, the production of documentation of these, and the standards which would contribute towards them in Period 3. In addition, there is on-going work on Socio-Economic Impact case studies within Activity 2.6 with a number of specific sites where the holistic socio-economic impact model is being evaluated.

2. The NoE needs to put in place a mechanism allowing a more effective quality control of the deliverables.

Following approval of JPA2, the Executive Committee implemented an internal review mechanism across all activities (please see Section 3).

Members of the Review College were selected to review drafts of individual deliverables ahead of final submission in almost all cases, although this process has not yet been supported by the review website as originally anticipated in JPA2. This website will be implemented early in JPA3 based on existing technologies.

3. The number of deliverables could be reduced and the profile and impact of those that remain increased.

The number of deliverables was significantly reduced following discussions with the Project Officer and these deliverables will be used to increase the profile and impact of EPOCH with other groups e.g. D.2.9 Research Agenda v2 (including background from Sector Watch) will be one of the input documents to the more broad ranging discussions of research agendas at the interface between technology and the arts and humanities. A workshop is already anticipated in this area for autumn 2006.

4. EPOCH should put in place a clear framework for evaluation including: benchmarking, usability evaluation, and accessibility evaluation.

Please see Section 3.1 Coordination of research activities and the description there of the plans for the Interactive Salon as part of the activities of the Interactive Institute.

The EPOCH website is routinely tested but there are some known limitations for the W3C testing service.

Outside of the funded support of EPOCH, the University of Brighton has designed and installed a facility suitable for testing of tools for assembling interactive experiences and for testing the resulting experiences with a variety of end users.

5. The NoE should investigate the possibility of increasing the number of SMEs engaged in the Newton projects.

Although it was considered to be unfeasible to increase the number of SMEs engaged in the current set of NEWTONs, there has been significant involvement through the creation of the Network of Expertise Centers and associate clusters. This has produced enquiries from potential Affiliated Participants, which are expected to result in some additional SME involvement during JPA3.

6. The NoE should propose mechanisms to intensify integration of end-users within the EPOCH.

In addition to the clusters mentioned above, the Network has begun a series of regional meetings whose aims include engagement with local cultural heritage organisations as demonstrated by the attendance at the inaugural meeting at Krakow, Poland and the planned meeting in Jaen, Spain.

7. The impact of EPOCH could be increased by identifying some of the key features of master and doctoral programmes on Cultural Heritage and favouring their creation

Please see below regarding proposed development of a Masters programme in Cultural Heritage under Activity 2.6.

8. There is a need to increase the awareness about EPOCH and its activities among junior researchers

Please see below regarding expansion of the Board of Directors to include an elected member from the junior researchers within the Consortium. A consultation of the entire partnership is taking place to update the lists of all researchers involved to facilitate this process. Steps have also been taken to involve junior researchers in the technical work of Workpackage 3 and in soliciting contributions for the EPOCH website.

9. Marketing of the Network's results is required as a means for augmenting impact

The Executive Committee has been proactive in entering into debate at strategic events (please see Section 2.2 Activity 2.5 Research Agenda and Section Activity 4.7 for a list of events).

10. The transparency of the decision making process would benefit from being less dependent on the small group of members of the executive board.

Please see below re expansion of the Executive Committee and Board of Directors.

11. NoE should increase membership and representativeness of the executive and board of directors to a total of twelve with an additional from the consortium.

The Executive Committee has already been expanded to include Workpackage Deputy Leaders and this group will be expanded further by the addition of an elected post from the Consortium. The Board of Directors will gain an additional member through this election as well as the election of a member from the junior researcher community.

12. The reviewers sensed that the NoE was very Brighton-centric and that caused them some concern.

The Consortium noted at the time of the report that the concern at the Review meeting was rather that illustrations in response to questions had appeared to be Brighton-centric. It is hoped that, given the wider representation of the Consortium at the July 2006 Review meeting, a more realistic sense of the integration of the partnership as a whole will be apparent.

13. Risk evaluation is mostly absent and should be given more attention in the future.

A Risk Register is under development within Activity 1.4 Monitoring and Evaluation.

In conclusion the second period of EPOCH has been a balancing act of attempting to keep momentum going despite the administrative difficulties. Some potentially very powerful collaborations are developing and the project has used the collaborations to quantify some of the critical issues impeding interoperability of tools and data. A key factor is now to be able to maintain that momentum in the move to JPA3.

A second challenge in the coming period will be to strengthen the new partnerships and cooperations and establish any formal mechanisms that will help take EPOCH forward and build the integration required for a

sustainable European Research Area for the intelligent use of technology in support of cultural heritage applications.

Section 2 – Workpackage progress of the period

1 Workpackage 1 Management

This workpackage's operations are documented in Section 3 of the report

1.1 Workpackage objectives and starting point of work at beginning of reporting period

See Section 3

1.2 Progress towards objectives – tasks worked on and achievements made with reference to planned objectives, identify contractors involved

See Section 3

1.3 Deviations from the project workprogramme, and corrective actions taken/suggested: identify the nature and the reason for the problem, identify contractors involved

See Section 3

1.4 List of deliverables, including due date and actual / foreseen submission date

Del. no.	Deliverable name	WP no.	Nature	Dissemination level	Due date (proj. month)	Actual / Forecast delivery date*
D1.5	2 nd Interim Activity Report	1	R	PU	21	27
D1.6	Periodic Activity Report for Yr 2	1	R	PU	25	27
D1.7	Periodic Management Report for Yr 2	1	R	CO	25	27

* - Delivery dates changed in accordance with the revised Period 2 end date of 30 April 2006.

1.5 List of milestones, including due date and actual / foreseen achievement date

Milestone no.	Milestone name	Workpackage no.	Date due	Actual / Forecast delivery date	Lead contractor
M1.2.3	On-line reporting of progress/issues	1	Month 19	27	1
M1.3.2	On-line reporting of eligible costs and effort	1	Month 19	27	1
M1.4.3	Implement Review College secure QA website	1	Month 19	28	1

Strategic Milestones

For WP1 the strategic milestones must relate either to managing the activities of the other workpackages to achieve the Network's objectives or to ensuring that EPOCH more than meets its contractual responsibilities on time and at high quality levels. The milestones all relate to different areas of achieving agreement:

- a) Establishing the review college with sufficient numbers of appropriately skilled and experienced members, covering a wide range of constituency perspectives (Month 6 at the latest – to allow for a second round of nominations if required and ratification of the membership by the first meeting of the Board of Directors). - *achieved*
- b) Getting agreement and operationalising the policy and procedures of the Network as well as revised Consortium Agreement for Partners and Affiliate Participants (Agreement of revisions expected Month 31 with VAST2006)
- c) Acceptance of the first annual report to the Commission, including review meeting, revision of the JPA, and audited accounts (Originally anticipated as target for month 17) – review meeting summary conclusion received Month 20 and written report Month 21, acceptance of audit certificated accounts received Month 22, acceptance of revision of the JPA received Month 25) – *achieved*
- d) Annual success at the review meetings, which will only be achieved if sufficient integration has been satisfactorily demonstrated (Month 26 – decisions now expected in month 28, 38, end of project)

2 Workpackage 2: Integrating activities

The various activities in this workpackage share a theme of bringing different communities together to define an agenda for integration. This activity uses a holistic view on the integration issues and priorities. Work in this second period has concentrated on:

- understanding the relations between the different stakeholders (activity 2.1)
- defining the major axis of research and development in ICT for the CH domain (activity 2.5)
- improve the coherence and cooperation between EPOCH partners and other related organisations (activity 2.7)
- understand the socio-economic impact of investments in CH projects in general and ICT technology in CH in specific (activity 2.6)
- building an operational structure that supports and improves the ICT in CH (activity 2.8)

2.1 Activity 2.1 Sector Watch

2.1.1 Starting point, and progress and achievements against objectives

The Sector Watch activity focuses on an overview of the status and needs of the CH domain and a clear understanding of all aspects concerning the use of ICT in the CH domain, and how to improve this use. This activity contains a detailed inventory of the ICT needs of all CH stakeholders, an inventory of all ICT technologies that are used or can be used in processing CH data, and an analysis of the success factors of the implementation of systems and the usability of the applications. Organisational structures will be studied and, if possible, implemented to continue this activity after the period of funding, possibly in connection with the activities planned in A2.8. As this activity is an ongoing activity for 4 years, the focus in JPA2 is on the areas that are considered the most urgent and most relevant for the ICH domain, taking into account input from Research Agenda, Review College, First Annual Review results and network members.

2.1.2 Methodological Considerations

It might have been expected that extensive on-line and/or paper-based surveys of potentially interested parties would be the natural way of gaining useful "user" input to the research. However this approach was felt from the very beginning to have limited usefulness, given past experience of frustrating results due to the low participation of heritage field professionals in such exercises (perceived lack of time, and lack of ICT

knowledge and concern), as well as the difficulty of designing relevant and well adapted questionnaires which could be applied equally to the wide diversity of cultural heritage institutions and practitioners.

A major component of the approach selected was therefore based on the identification of qualified practitioners and experienced actors in the field of CH. Through personal contacts, meetings and workshops, it has been possible to benefit from the guidance and the involvement of leading international specialised organisations like UNESCO World Heritage Centre, ICCROM, ICOM, ICOMOS, etc... Successive "position papers" have been circulated in order to collect reactions, ideas and proposals. Experience has shown that this qualitative approach of personal engagement is much more effective and fruitful than the circulation of standardised questionnaires.

Several specialised workshops with limited number of experts have therefore been organised in order to open a debate and confront ideas and experiences. This program began in the first year and has been continued into the second year. In fact the process mirrors that a number of groups seeking to span potential ICT support in the Humanities have adopted as reported in D2.9 the deliverable resulting primarily from activities aiming to achieve agreement on a common research agenda. (see the description of Activity 2.5 below).

During the course of this reporting period, workshops have been held at the ICOMOS Headquarters in Paris (17th March 2005 and the ICCROM HQ in Rome. (6-7 March 2006). The results from these workshops were discussed at the EPOCH research Agenda workshop at the beginning of April 2006 and used to develop the current planned developments on the Common Research Agenda. In addition researchers in WP2 have been taking opportunities to exploit synergies with other EPOCH activities (for example, the regional meeting held in Krakow) to broaden the reach of the consultation exercises.

As stated in JPA 2, a restructuring of workpackage 2 activities 1-3, to create an integrated activity 2.1 (called "Sector Watch) carries forward work begun in separate strands of "Stakeholder Needs", "Vertical Integration" and "Horizontal Integration" of Year 1. This merging of the separate strands allowed a more efficient and effective application of the resources deployed to continue and develop the work started in year 1 and to move from data collection of stakeholder needs and technological opportunities to a more dynamic model of integration processes.

The experience and data collected during Year 1 motivated a more holistic analysis. The connection between 2.1, 2.2, and 2.3 and the feedback between them provided the basis for an overall analysis of integration processes, which is, in itself, valuable for producing the recommendations that can effectively support the formulation of a Common Research Agenda. Activity 2.1 deals with stakeholders' perceived and reported needs; Activity 2.2 provides an objective survey of the integration experience of CH institutions and their interaction with technology providers; Activity 2.3 is a survey of all technologies presently utilized or potentially utilizable in the CH sector. Thus the three activities together provide the basis for a sound evaluation of integration needs, integration experience, and integration potential, required by the Common Research Agenda. Yet an additional goal of EPOCH Sector Watch is not only to gain "a clear understanding of all aspects concerning the use of ICT in the CH domain," but also to make recommendations on "how to improve this use." Suggestions in this direction have become one of the main outcomes of the Year 2 research.

The recommendations of the First Annual Review suggested the following areas of increased focus for Year 2:

- Expansion of geographical coverage;
- Survey of technologies in all stages of the cultural heritage production "pipeline";
- Increased attention to cultural heritage stakeholders (e.g. technology developers and suppliers), in addition to the managers and administrators of cultural heritage sites.

The combined Sector Watch Activity addressed these reviewer concerns through the following steps:

2.1.3 Expansion of Geographical Coverage

In addition to refining stakeholder categories through broadened consultation at workshops with European-wide heritage organizations (HEREIN, ICCROM, ICOMOS), the integration survey was broadened from an initial target area in Belgium to a total of 14 countries, of which 9 were EU members (Denmark, France, Germany, Greece, Italy, the Netherlands, Spain, Sweden and UK) and 5 were non-EU countries (Australia,

Canada, Japan, Switzerland and US). It is anticipated that this geographical scope will focus more intensely on the new EU accession states and other Eastern European countries in Year 3. This process was begun at the Krakow regional meetings, documented elsewhere in this report.

2.1.4 Survey of all “pipeline” technologies

In the light of the results of the year 1 survey, and reviewer comments, the Year 2 Sector watch survey developed a single integrated graphic scheme of overall structure of ICT usage for horizontal and vertical integration activity. Based on previous classification systems used within EPOCH, this scheme was especially designed to be understood by non-technologists, being based on general characteristics (“Visual”, “Dimensional”, “Locational”, “Environmental”) rather than division by specific application. This scheme does not contradict, but can be used alongside EPOCH’s more detailed categorization used in WP 3.

2.1.5 Inclusion of All Cultural Stakeholders

The five main stakeholder classes have been further sub-divided, but even as the categorization continued, certain commonalities between the various classes of stakeholders emerged. The increasing research interest of Activity 2.1 in process led to an examination of relations between the various stakeholder classes which in turn suggested a functional division into “customers,” “providers,” and “end-users” in which the identification of particular stakeholder class was less important for needs and integration analysis than the role that it played in a particular project or research environment.

It remains difficult to be truly engaging all sectors of Cultural Heritage professionals. Although, throughout the research, numerous experts from various horizons were contacted, in several cases, these experts, while taking on the responsibility to react to the position papers, did not accept the invitation to take part in the workshops, expressing doubts and concerns about the true potential and acknowledged shortcomings of ICT in actually improving their work.

Many curators and other end users also showed little enthusiasm about ICT developments. Several site and museum managers of small and medium size argued a lack of the resources needed to apply ICT solutions. They pointed out that they have neither the staff, nor the money to implement ICT tools and maintain them. They are also suspicious about ICT, since they have the feeling that the providers are pushing products that do not really meet their needs.

Many CH specialists were reluctant to invest time and resources in issues that they consider as incessant development and endemic obsolescence which mean that such consultation exercises can be perceived as not corresponding with their priorities.

2.1.6 Formulation of Scenarios and Assessment Model

The Year 1 activities were confined to collection of data about stakeholders, integration experiences, and available technologies, but they did not attempt to explain the interrelations between stakeholders or the processes through which existing or emerging technologies were successfully (or unsuccessfully) integrated. Thus, the overall methodological strategy of Year 2 Sector Watch was to continue data collection to fill out previous gaps in general classification and to process this primary information to produce alternative integration scenarios. This, in turn, led to the formulation of an initial assessment model that addresses some of the most common obstacles to effective CH-ICT integration across the entire CH domain.

2.1.7 Conclusions

Activity 2.1 has been conceived as the data collection, shifting and analysis process used, in part, to inform the discussions on the Common Research Agenda under activity 2.5. This linkage has operated through the EPOCH research agenda workshops (e.g. at EVA Florence) which are co-sponsored by the two activities. In many ways this activity reflects the processes being used by other constituencies in consulting their user base and as we shall see in the next section these too are being used to feed the research agenda. With the number of such consultation exercises being undertaken between ICT and the humanities, it is probably a good time to re-evaluate the role of the specific sector watch activity over the remaining funded period of EPOCH with a view to understanding the role relative to the ongoing establishment of the Network of Expertise Centres, for example.

2.1.8 Deviations from plans and corrective actions

During the time from January 2006 to the end of the reporting period there has been significant upheaval in the coordination of this workpackage. The workpackage leader (Daniel Pletinckx) has left the employ of the Ename Centre and moved to work for Visual Dimension on a full time basis. Agreement has therefore been needed on how to repartition the technical work previously assigned to the Ename Centre. This has taken some time, and has necessitated a proposal for the accession of Visual Dimension as a full EPOCH partner, with the associated organisational requirements for partner voting, etc. While this has not impacted on the direction of work, intent or objectives of Activity 2.1, it has involved significant extra work, which will only really be complete when JPA3 is formally agreed. The reorganisation affects all aspects of WP2 but, in the interests of brevity, this paragraph will not be repeated under each activity.

2.2 Activity 2.5 Develop Research Agenda

2.2.1 Starting point, and progress and achievements against objectives

The EPOCH activity in defining a Common Research Agenda is an integral part of fostering the development of a European Research Area in research on the support of ICT for Cultural Heritage. The principal benefits of a Common Research Agenda on research and technological development in cultural heritage ICT are in helping to shape the priorities for research effort, investment and formulating policy.

The last few months (February - April 2006) have been a very important period, internationally, for the development of research agendas for the support and interaction of the cultural heritage sector with technological solutions. A number of communities have been meeting and discussing their priorities for the next few years. They represent different constituencies, have different perspectives and different time horizons, but underneath the surface they are united by many of the challenges they face.

All of the following meetings have discussed research priorities in one form or another, with participation from EPOCH partners:

1. **Summit on Digital Tools for the Humanities**, University of Virginia, September 28-30, 2005. (24pp) <http://www.iath.virginia.edu/dtsummit/SummitText.pdf>.

Participants at this event were from a wide variety of disciplines, such as history, literature, archaeology, linguistics, classics and philosophy as well as computer science and several social sciences. The shared characteristic of the participants included and interest in the use of digital resources to enable and support scholarly activities. The Summit's objectives were to explore how these tools, and digital resources, along with the underlying cyber-infrastructure could be used to accomplish a number of goals in research, scholarship and education. Dr Sorin Hermon from PIN attended the summit.

2. **EC FP7 brainstorming workshop "Digital Libraries and Living History"** (Luxembourg, 27th Feb 2006).

This invitation event was one of the preparatory sessions run by the Commission on formulating a research agenda for FP7. Prof David Arnold attended on a personal basis, but contributed from an EPOCH perspective. The results of the whole exercise of formulating FP7 plans are of direct relevance to EPOCH and to the Common Research Agenda. Some results have been referred to in Deliverable D2.9.

3. **EPOCH WORKSHOP, ICCROM**, ROME, 5th – 7th of March 2006.

This event was organised by CHEDI, and resulted in a report which was fed back into the EPOCH Research Agenda Workshop at Florence, in April 2006

4. **New Heritage Conference: Beyond Verisimilitude** (Hong Kong, March 12-14th, 2006).

This event was established from very much a cultural heritage presentation perspective rather than being driven by technical possibility. Neil Silberman of the Ename Centre and David Arnold of the University of Brighton were both on the Program Committee.

5. **Who Owns the Past?** (Ghent, 22-25th March 2006).

Organized by the partner Ename Centre, and attended by Franco Niccolucci to present the EPOCH perspective, the Colloquium aimed at examining questions relating to public responsibilities in the preservation and interpretation of cultural heritage, with a view towards new approaches and technologies,

especially in places where heritage is in conflict. These issues suggested new research themes, in particular concerning diversity and inclusiveness.

6. **Grand Challenges in Computer Science Conference** (Glasgow, Scotland, 22-24th March 06)

This event was a sharp contrast to the previous one and involved a group of around 130 research professors in computer science. Professor Arnold presented a proposed new Grand Challenge, with the objective of getting recognition of the serious computer science research that is necessary to achieve a vision of “Bringing the Past to Life for the Citizen”. In a very real sense, if the interdisciplinary research agenda is to attract the best research talent then the groups that might typically attend these previous two events need to be engaged in understanding each others perspectives. This event was an opportunity to get “buy-in” to the intellectual challenges involved from a computer scientist’s perspective.

7. **Preserving Our Past workshop** (Birmingham, England, 29th March 06)

Jaime Kaminski and David Arnold were both accepted as attendees at this invitation only workshop which was attended by an eclectic mixture of researchers and practitioners. The event was co-sponsored by English Heritage and four UK Research Councils. It was a multi-disciplinary rather than inter-disciplinary, but significant in the breadth of research councils represented and in the potential for signifying a genuine interest in fostering a shared agenda for future research across the disciplinary boundaries.

One result of the workshop was a call for proposals for research clusters to take the ideas further and as a result a bid combining aspects of the Computer Science agenda with the theme of interpretation and engagement has been submitted. Should this be successful (and that is by no means certain) the cluster would offer a forum for taking further the development of the Common Research Agenda in a highly inter-disciplinary context.

8. **EPOCH Research Agenda Workshop** (Florence, Italy, 2nd – 3rd April 06)

This event was organised adjacent to the EVA Florence conference and brought together those working on the Research Agenda from an EPOCH perspective. The results of the Rome event were presented and of earlier work by Salzburg Research and others. Developments from that workshop have been taken forward in D2.9

9. **EUROPEAN WORKSHOP ON CULTURE & TECHNOLOGY** (Pistoia, Italy, 8th – 9th April 2006). Held immediately after the EVA Florence conference, this workshop brought together a small number of attendees who were engaged in the debate of how to enable the interdisciplinary agenda to be taken forward with appropriate community engagement. The final report is attached to D2.9 and will be published in the coming months. The workshop was attended (amongst others) by Seamus Ross and David Arnold and Franco Niccolucci.

10. **UK Arts and Humanities Research Council, ICT Research Methods Expert Seminar on Virtual History and Archaeology** (Sheffield, UK, 20th-22nd April 2006). This event was one of a series held under the auspices of the Arts and Humanities Research Council’s ICT research methods network. The emphasis at this event was on the scholastic use of ICT tools and the advanced nature of the technologies required to support that use. Amongst others – Julian Richards, Richard Beacham and David Arnold attended from various aspects of EPOCH.

This range of events shows the different perspectives to be brought on the common research agenda. There are many overlapping communities, each with valid priorities in their corner of the multi-disciplinary interaction.

2.2.2 Deviations from plans and corrective actions

There are no significant variations from plan here, although the opportunity offered by collaboration with the development of research agendas elsewhere should not be lost. The potential impact is therefore that the EPOCH research Agenda activity seeks to adopt timescales that are not defined solely by the pressures on EPOCH, but need to be set in order to accommodate the timescales of other groups.

2.3 Activity 2.6 Socio-economic impact

2.3.1 Starting point, and progress and achievements against objectives

Deliverables

Good progress is being made on developing analytical frameworks that will aid heritage managers evaluate the impact of technology on heritage, and on creating the tools for analysis from year 1, which developed and tested a new generic holistic socio-economic impact model. In this period, we have focused on developing a specific ICT impact model that is logically derived from the generic holistic heritage site model. We have also tested the ICT socio-economic impact model and subsequently refined the holistic impact model.

The partners in Activity 2.6 are all engaged in testing out methodologies with different heritage sites in different contexts. The activity 2.6 team have all agreed targets research outputs designed to meet the contracted deliverables.

Special effort has been made to develop cases in different country contexts (hence the new cases in Turin, Italy and Dieppe France to add to the Belgium Ename case study and the British test cases).

Efforts are being made to integrate activities across Workpackage 2 to build synergies.

Dissemination

The Heritage Impact conference will be repeated in 2006 because it has proved to be an excellent basis for dissemination of information and raising the profile of EPOCH plus delivers published results. Several publications are planned over the next two years in Activity 2.6.

The EPOCH web site is being used as a means to disseminate the models for e-consultation among the members. Currently the first holistic model has been disseminated in this way.

Sustainability

The decision to explore a new Masters course in Cultural Heritage Management will help to create a sustainable model resulting from the EPOCH support. The degree will have strong socio-economic impact and technology dimensions, will help to create a close link between learning and heritage practitioners and will foster mutually beneficial ties between research and teaching. This will allow research to continue in this crucial area after the official funding ceases.

Overview of Activities

Research meetings are held every week with EPOCH Impact Research team. Critical review of impact methodologies and development of analytical impact frameworks is continuing. Literature from Directorate-General for Enterprise (Tourism Unit) was studied to contextualise EPOCH within the enterprise and SME field by Service Sector Management (SSM) of the University of Brighton. Further literature research was conducted into the links between cultural heritage, sustainable tourism, and social identity in specific communities. Initial finding indicating the definitional paradoxes associated with the triadic relationship between culture-heritage-tourism. By the end of March 2006, a first draft of Social Impacts literature review was compiled.

More emphasis was devoted towards researching the social impacts of cultural heritage (specific to consuming industrial heritage) as to meet requirements of the EPOCH objectives in the holistic framework.

Members of Activity 2.6 attended the first and second Network of Expertise Centres meetings (activity 2.8) ensuring horizontal integration objectives on WP2.

An activity 2.6 research review and planning meeting was held September 15, 2005 (Peter Burns, Ruth Owen, Dimitrios Buhalis, Jim McLoughlin, Babak Sodagar, Jaime Kaminski), priorities/timetable and outcomes for the March 2006 deadline was agreed.

University of Surrey prepared a data request sheet in cooperation with the University of Brighton. This was presented to EPOCH workshop attendees at VAST 2005, Pisa, November 8, 2005 and further discussed with the Brighton team. End of March 2006, the Bath case study on the use of technology was written up and reviewed internally.

Meetings were held to discuss possibility of integrating EPOCH's objectives/deliverables with a PhD researcher. Agreement made that synergies lie between the two, and mutually beneficial to EPOCH requirements and the objectives of PhD student's thesis "The consumption of heritage tourism and its material culture".

Research and data collection at the Brighton Royal Pavilion cultural heritage site is ongoing, this site is used as a case study (a pre-use of technology test site). Many meetings with the director, staff and local stakeholders have been conducted.

A number of meetings have been organised with trustees of the Brighton Fishing Museum, which is planning a project to install technology to enhance the visitor experience. This museum will participate in the whole project as a further case study. This will allow crucial data to be obtained about much of the project lifecycle between conception to deployment. This type of data is hard to find.

Research and data collection is ongoing at the Ennema Cultural heritage site (a technology focused test site). A study visit was conducted at Ennema, Belgium in order to undertake field research for the case studies for the next deliverable. Based on this field visit a tentative, hybrid methodology was developed ready for testing to research social impacts of cultural heritage sites in a given locale.

Two meetings were held at the British Museum as it is a potentially excellent test site of the use of technology for the exhibition "the Mummy: the inside story". Brighton Business School has been approved to study the exhibition, and after delays due to staff changes at the museum the project can progress.

A preliminary meeting was held with the head of the museum and castle site in Dieppe, France (Mr Ickowicz) to explore and develop the French context for impact evaluation (November 3-4, 2005). A case study has been agreed for development in Dieppe on 14-15 December. The curator of the museum will give a presentation at Heritage Impact 2006. Further contacts have been made with the French heritage impact evaluation community. On Feb 10, 2006, a briefing meeting for the parameters of the research and for initial conference paper was conducted. A meeting took place in Paris on Feb 13, 2006, with Bernadette Goldstein – Directorate of Museums in France – testing the holistic models, and exploring collaborative testing of the ICT holistic model on a new technology project.

At the end of November 2005, a new case study for researching impact was agreed at the National Museum of cinema in Turin. This focuses on technology and educational impact and offers the Italian context for socio-economic impact. Three heads of department from the museum will present at Heritage Impact 2006. On March 8-9, 2006, data was gathered and the holistic model tested in a follow up meeting.

A site visit took place (January 2006) to the Big Pit Coal Mining Museum in Blaenafon, South Wales (designated World Heritage site in 2001 because of its major role in the Industrial Revolution). The site was assessed for the potential of collecting data related to the social impacts of significant sites such as this. A follow up meeting on March 8-10, 2006, they plan to deploy a PDA based system in a year to help visitors understand the landscape. On March 10-14, 2006, on-site interviews conducted at Big Pit Museum with visitors for Cultural Identity Impact research. Questions have been asked regarding the social impacts and technological representation of industrial heritage on site. Findings compiled.

Also visited was the National Waterside Museum in Swansea which has a considerable deployment of ICT.

The University of Surrey have conducted research into the application of Audio guides at the Roman Baths Museum in Bath, UK. This research will complement research by Brighton on the impact of Audio-guides at the Royal Pavilion Palace. Surrey will also conduct research on the impact and outcomes of Web technology at the National Maritime Museum in Greenwich, UK.

A meeting took place on March 3, 2006, with Prof Waelkens (Sagalassos Division) to establish a potential new context for testing the holistic models – Sagalassos in Turkey. Agreement was given to proceed in principle depending on approval of funds – target research dates June 2006 to April 2008.

The Heritage Impact 2005 Symposium – a focused conference on socio-economic impact, with a technology impact dimension – was being planned and prepared, papers being written and presented. This symposium took place on July 7-8 in the Royal Pavilion. Some key outcomes include:

- Attracted numerous heritage experts and technology experts from all over Europe to focus on impact.
- Forum to test EPOCH impact research to-date.
- Produced publication of Symposium proceedings, covering technology impact dimensions and how it links to the wider context.
- Effective forum for dissemination of impact knowledge.
- Widened the network of experts.
- Effectively promoted the name EPOCH and its mission to a wider European audience.
- Advances the research agenda on technology impact research in Europe.
- Excellent feedback has been received.
- Plans to produce a book for dissemination of information.

After the success of Heritage Impact 2005 much effort has been devoted towards the production and organisation of Heritage Impact 2006.

Activity 2.6 staff spent time at the EPOCH stand at the ‘Museums and Heritage Show’ in Earl’s Court, London. This provided the opportunity to disseminate information about the activities of Activity 2.6.

April 10, 2006 a meeting with coordinators of the European Association of Historic Towns and Regions was conducted that looked at future research directions. Testing of the first two models was also conducted.

A socio-economic impact workshop was organised on 2 October 2005 at the VSMM 2005 conference in Ghent, Belgium.

The ‘New Policies for Cultural Tourism’ conference and professional meeting was attended in Barcelona (26, 27 and 28 May). This has helped to disseminate awareness about EPOCH to a wider audience, as well as providing material for inclusion in the future reports.

The ‘Pleasures and pressures of income generation’ in London on 14 September was attended – organised by the campaign for museums – insights into dynamic impact and role of technology.

The VAST 2005 conference was attended (November 8-11) in Pisa, Italy.

The third annual heritage funding conference at the National Portrait Gallery in London was attended (14 March). Used for providing context for the frameworks we are developing.

“Preserving our past workshop” in Birmingham – organised by English Heritage and four other research funding bodies in the UK – was attended on March 29, 2006. Access to the workshop was by invitation only.

Links have been made with a young researcher from Spain - Begoña Sanchez Royo (9 December and onwards) – this meeting looked at the potential of developing Spanish case studies. Future research collaboration is anticipated here.

University of Brighton - Brighton Business School (UoB BBS) is exploring the possibility of a new MBA course called “Cultural Heritage Management” to be promoted and supported by EPOCH. The course will have strong technology management and socio-economic impact dimensions drawing on the strengths from the network’s research. This also will help to create sustainability. Meetings were held with WP2 and WP4 leaders to support this new MBA course.

It is important to emphasise that there has been considerable evolution of the rationale of Activity 2.6. Much more emphasis is now placed on the ‘understanding of impact’ and importantly how business ‘processes’ can be used to affect impact in a positive manner. These directions will have crucial implications for the sector which currently lacks these skills.

2.3.2 Deviations from plans and corrective actions

The WP 2.6 research team are on track to report on a tested analytical framework for evaluating socio-economic impact of technology on heritage sites – this is a major deliverable. This model has the potential to change the way that heritage site managers conceptualise their organisations and increase the potential for positive impacts and outcomes. These models will contribute to the professionalisation of the sector.

The case research/testing is progressing well but it is necessary to recognise that the quality of the data/information from sites in certain cases is not always in a form or of sufficient quality to enable full impact testing. It has become apparent that heritage sites currently do not collect the right type of data for impact studies, nor is the data that is collected a form that is easily accessible. Consultation with others in the field of impact analysis reveals that this situation is widespread in the heritage sector.

Furthermore, staff changes at the British Museum have slowed down access to the exhibition data. These issues have now been resolved and the case study is resuming on July 11, 2006.

The need to acquire new data with new questionnaires requires extra field work. This is not only more resource intensive, but it means that some cases will take longer to research than originally planned.

The report for the EU in April will contain the latest developed models for testing impact and will report on some cases. Some of these case reports will be work in progress rather than the finished piece. It is intended to further test in years 3 and 4 of the EPOCH project and to refine the impact models being developed. Dissemination strategies are in place already.

More resources will be needed in Activity 2.6 for years 3 and 4 if the model testing through case work is to deliver the best results. Originally activity 2.6 had its comparatively modest budget front loaded leaving very low resources to underpin the practical research for the next two years. The Activity 2.6 team proposes to give serious consideration to reallocating funds to socio-economic impact research, viewed as increasingly important by policy makers.

2.4 Activity 2.7 Brokerage

2.4.1 Starting point, and progress and achievements against objectives

Before the start of the funded period a great deal of information had been gathered from partners concerning the facilities, skills, datasets, and systems that they would be prepared to bring into a brokerage scheme. The plans for brokerage envisaged an on-line database and search facility along with specific calls for proposals to which EPOCH might contribute partial support.

By the time the funded period started much of the information which had been returned was over a year old and it was felt that before the information went live it should be validated by the partners concerned with minimum effort. It has therefore been decided that the data had to be available through an on-line database with on-line update by partners in the restricted area of the site. The data entry had been undertaken and is online. During this period, a general mailing to the membership was sent out to update the partner information. Several partners replied and the new data was sent to the EPOCH webmaster.

Several offers were made to the brokerage service of new high end infrastructure that became available at EPOCH partners (such as for example motion-capture equipment). On the other hand, very few demands for use of equipment, infrastructure, skills, etc. arose. This is to our opinion due to the new nature of the service, so that partners do not always realise the opportunities created by the brokerage service. The use by companies doing cultural heritage projects was not present yet, as a structured interface to the companies (see Activity 2.8) is still in development.

The EPOCH brokerage activities concentrated on the establishing new cooperations between non EPOCH Cultural Heritage organisations and EPOCH partners, and amongst EPOCH partners. Most of these cooperations were established on a permanent basis, and continue to have impact and practical results. Several of these cooperations were established in the context of the VSMM2005 conference, organised by

the Ename Centre in Ghent, Belgium (Oct 3 – 7, 2005). Several actions happened in close cooperation with WP4.

The VSMM (Virtual Systems And Multimedia) conference originated in Japan and is organised every year in another part of the world. Hence, the conference appeals to a worldwide audience of researchers, mainly from Asia and the USA. An important part of the programme is devoted to cultural heritage. This conference was well attended by EPOCH partners, who had the opportunity to liaise with their Asian, Australian and American colleagues. Several EPOCH partners published papers at VSMM2005, including papers on EPOCH activities. The VSMM2005 publication was printed by an EPOCH partner with support from EPOCH.

First of all, the workshop “Effective Implementation of Technology in the Cultural Heritage Domain” at VSMM2005 established new cooperations of CultNat (Egypt), the Virtual Heritage Centre Rome and Albertay University at Dundee (UK) with other EPOCH partners in the context of Activity 2.8. CultNat and the VHC became potential expertise centres through this meeting and are very active since then in the Network of Expertise Centres (see Activity 2.8).

Through this cooperation, several EPOCH partners were invited to participate in the Virtual Rome exhibition (Sept-Nov 2005) organised by the Virtual Heritage Centre and the Sistema Museale Fori Imperiali (City of Rome). More than 40.000 visitors could learn about the work that EPOCH partners created in the context of virtual reconstructions (related to Rome or the Roman Empire), user interfaces and innovative ways of presenting cultural heritage data and objects. There is a fundamental agreement with EPOCH to provide applications from this temporary exhibition to the EPOCH Interactive Salon that will open in Stockholm later in 2006.

In the context of this conference, a full day tutorial on digitalisation and Cultural Heritage Resource Information Systems (CHRIS) was organised, in cooperation with the World Heritage Centre (UNESCO), the World Monuments Fund and Lemaire Institute, KULeuven (EPOCH partner).

VSMM has close links to the Virtual Heritage Network. A close cooperation with both organisations has been established, and possible common projects have been defined. One of the foreseen activities will be a joint VSMM-EPOCH workshop on the use of games engines and edutainment in cultural heritage at VSMM2006.

Several new cooperations within EPOCH were also established. The Centro Andaluz de Arqueología Ibérica (University of Jaén) uses the EPOCH know-how of PIN to establish a 3D database on archaeological pottery (funded by Andalusian Council).

The vulnerability of the site of Akrotiri (where EPOCH partner Syntres is active) that was reported in the year 1 deliverables, was shown in an unexpected and painful way. A part of the roof collapsed on September 23, 2005, killing one person and injuring six others. Due to the investigation that followed, the site was closed and rain was entering the site for several months through the open roof, causing damage to the site. This tragic accident shows the urgent necessity of digitalisation of this site. Specific photographic recordings of the Xeste 3 building, that were made during previous visits to the site, will be used to test the 3D KIOSK software, so that a full blown proposal can be made to digitise the site with an unsurpassed realism and efficiency.

As VSMM2005, a tutorial on “Real-Time Virtual Characters for Mixed Reality Cultural Heritage Applications” established a first close cooperation on software and specification level between MiraLab (Univ. of Geneva) and the Virtual Reality Lab (EPFL) on one side and the University of East Anglia on the other side, as preparation of upcoming Newton CHARACTERISE.

Triggered by a query of the Flemish Heritage Institute (EPOCH partner VIOE, formerly IAP), a workshop on Central Archaeological Inventories (CAI) is being prepared in cooperation with the archaeological services of Belgium, Netherlands, Italy, England, Wales, Scotland, ... This workshop will consist of a technical meeting in Brussels, foreseen to take place in June 2006, an international workshop in October 2006 in Brussels, and the establishing of a CAI task force to guide the development of CAIs in each of the involved countries or regions. EPOCH know-how and tools on archaeological databases will be presented during the workshop and provided to the development teams. The goal of this effort is to bring all involved partners together, decide a common strategy, optimise the use and development of these CAIs and even link them. In this period, contacts with involved partners and preparation of the meetings and workshop have taken place.

A similar issue was brought forward concerning Location Based Services for cultural routes. Cultural Heritage and tourism organisations both are looking into the use of GPS and multimedia for walking, bicycle and car tours and struggle with the in-depth changes that these technologies trigger in their organisations and operations (including a closer cooperation between CH and tourism organisations). As such tours are a major asset of touristic organisations, and as the current acceptance of digital technology in tourism is low, a proper strategy is needed to design, manage and market e-tourism. As EPOCH has several partners that are active in this domain and have a vested interest in closer cooperation and development of e-tourism, a two day EPOCH workshop will be organised at the end of 2006. This workshop will bring together technology providers, content providers, touristic and cultural heritage organisations. In this period, contact with involved partners and preparation of the workshop has taken place.

A good example of such a cultural route that will have significant technological support is Francia Media (<http://www.franciamedia.org/>) which establishes a major exhibition in Brussels and Verona and a network of cultural routes in the former Francia Media kingdom (the area from the Netherlands to Slovenia and the middle of Italy). EPOCH has been asked to provide technology and know how for the exhibition and the cultural route. The start of the Francia Media project is planned June 1, 2006. Contacts have been made with Flemish ICT projects (i-City, ...) and 6FP projects (WalkonWeb) to cooperate on the cultural route. Also, a cooperation with the Virtual Heritage Centre Rome (see also activity 2.8) will be established, as cultural routes are seen by the VHC as a major area of research and development. For the exhibition, there is a major interest in several EPOCH showcases to be used.

In the first period, games technology and edutainment was voted to be of secondary importance by the EPOCH membership. Nevertheless, many other evidence exists that significant opportunities for the cultural heritage domain are created by games technologies. Preparations are made to organise a workshop on "Games Technology and Edutainment for Cultural Heritage" (at VSMM2006 or VAST2006), to get solid ground on the opportunities and problems of this technology in CH.

The regional meeting in Krakow (Jan 20-21, 2006) triggered vivid interest in the technology and approach of EPOCH, and interest in affiliated membership was expressed. The follow up of this meeting has started, and several concrete projects and cooperations seem to appear from it. One project by the city of Budapest for example will evaluate the use of database technology and 3D from images to manage the vast amount of statues and plaques (1100) in the city. The second regional meeting in Jaèn, Spain (in cooperation with local partners CAAI and Diputacion Provincial de Jaèn) is being prepared.

Within the EPOCH Network of Expertise Centres, meetings started to create permanent demonstrations of EPOCH technology at each centre, hence creating a strong regional visibility of EPOCH technology and know how plus a direct outreach to local CH partners and CH related SMEs. These demonstrations will be based upon EPOCH scenarios that are being developed in WP2 and WP3. This effort goes together with the creation of the Interactive Salon in Stockholm (activity 3.3).

To leverage the uptake of new technologies and improve the fitness for use of existing applications, a Usability Squad was defined. This group of experts, taken from several EPOCH partners, can be used to verify the usability of new or existing applications, formulate recommendations for improvements (in the form of a detailed report) and coach the implementation of these improvements. A new form for calling upon this usability check-up has been designed. A first demand has been received from the Flemish Heritage Institute.

The call for feasibility studies and prototypes was successful and 8 proposals were received, a form for applying for funding (max 5000 euros/proposal) helped in standardising the proposal, to ensure an efficient review. The proposals of PIN, University of Surrey, Technical University of Crete, University of Madrid, University of Barcelona and University of Sussex were sent to members of the Review College for evaluation. Not all reviews were already received at the end of this period.

It is expected from the discussions within the Network of Expertise Centres that the brokerage activity will gradually transit towards these Centres. This activity not only fits very well with the nature of these Centres, but creates a higher cohesion between the different CH actors, both on a local and European level.

2.4.2 Deviations from plans and corrective actions

The Ename Center has ceased its responsibility over activity 2.7 Brokerage Schemes by March 15, 2006, and Daniel Pletinckx left the Ename Center. Responsibility over the activity is continued by Daniel Pletinckx, who has hired a person to focus on integration activities, more particular on activity 2.7.

The download area for software and data sets need more attention. A systematic definition of useful datasets needs to be made and active collection of these datasets amongst the partners needs to be organised. This also holds for software tools. This area will get much more attention in the new configuration. This will be particularly useful in cooperation with scenarios and available software tools.

2.5 Activity 2.8 Encouragement of SMEs' participation

2.5.1 Starting point, and progress and achievements against objectives

During the first year, we developed a strategy on how to encourage SMEs participation in a learning network (cluster). This strategy includes the development of an EPOCH Network of Expertise Centres that will provide the link between research and implementation of IT related projects in the CH domain and will guarantee quality and standards, combined with the development of a learning network/cluster of companies around the Expertise Centres.

Through a Focus Group with 9 companies active in CH at a workshop at the VAST2004 conference (Dec 2004), we tested the ideas of this Network of Expertise Centers (NoEC) and the learning network/cluster of companies and other organizations active in the CH domain linked to each Expertise Centre, with very encouraging results. During the session the companies and organisations summarised their problems with the CH domain as follows:

- Ignorance; lack of standards
- Low price for products and services
- Lack of acknowledgement of companies' expertise
- Low opportunities/size of market
- Vicious circle of innovation/use (teach the client)
- Lack of expertise (teach the client)
- Building interdisciplinary know how
- Long decision process
- Hard start up
- After sales; too high expectations
- Customer incapable of change management
- Lack of sharing of knowledge
- Short life cycle of technology
- Cash flow problem due to long lead time of CH projects

During the first period of the EPOCH project, the University of Brighton (CENTRIM) together with the 2.8 partners (Ename Center, Visual Acuity Ltd. and University of Surrey)

- Established a better understanding of the needs and challenges faced by stakeholders involved in the cultural heritage domain;
- Decided to focus, in this activity, exclusively in technology related SMEs and other companies in the cultural heritage domain;
- Developed a strategy on how to encourage SMEs participation in a learning network (cluster) of companies and CH organisations, coordinated and facilitated by the local Expertise Centre.
- Developed a first set of methodological guidelines for the implementation of this strategy;

This knowledge was refined during the second period by organising two other workshops.

The first workshop was organized during the 11th International Conference on Virtual Systems and Multimedia (VSMM 2005), Ghent 3-7/10/2005. This workshop brought together several international institutions that use technology in the Cultural Heritage domain and want to exchange information on the optimal use and implementation of technology.

The Institutions and their representatives are:

- Prof. Dr. Fathi Saleh Director, CULTNAT (Center for Documentation of Cultural and Natural Heritage), Egypt
- Dr. Maurizio Forte, Vice President Virtual Heritage Network, CNR - ITABC, Rome, Italy
- John Smith, Head of Research and Innovation, the Forum Trust Ltd, Norwich, U.K
- Jan.Stobbe, Region Kop Van Noord-Holland, Netherlands
- John Sutherland, University of Abertay Dundee, and Director of Simplicity Training, Scotland U.K
- Brett Leavy, ACID, (Australasian CRC for Interaction Design), Australia
- Daniel Pletinckx, Ename Center for Public Archaeology and Heritage Presentation, Belgium

The workshop was designed to be interactive and its aim was to map the experience and expertise of those institutions in order to build a discussion forum for further collaboration. During the workshop the participants designed their own institute's "Radar of Activities" concentrating in four main areas:

- In house activities;
- Activities with SMEs and other IT companies;
- Partnership and activities with governmental and /or regional bodies;
- Partnerships and activities with Technology Research Centres

Furthermore, the participants had to indicate the level of maturity of their activities (in place, in development, on horizon) as well as the level of difficulty in their relationships with the different actors (Companies, Government Institutions, Research Centres or even their own personnel).

The outcome of the workshop was extremely interesting and encouraging as participants realized the experience, expertise and competencies of each other as well as their complementarities. They also shared common understandings as well as common frustrations in dealing with different actors (governmental bodies, companies etc.).

During this workshop, the uniqueness of the institutions was clearly demonstrated, regarding to their relations to research & technology, government and private companies.

The second workshop was organized during the November 2005 VAST Conference in Pisa, Italy.

The aim of this workshop was to engage institutions active in CH into forming a Learning group of Expertise Centers where they would learn about new technological solutions, share experiences and applications, create standards as well as improve their engagement with companies, research organizations and policy makers (governmental institutions). The participants in the workshop were:

- Franco Niccolucci, PIN, Italy
- Halina Gottlieb, The Interactive Institute, Sweden
- Paolo Manunta, Planetek, Italy (EPOCH SME)
- Ranya Boraie, CultNat, Egypt
- Arturo Ruiz, CAAI, Spain
- Eva Zanyi, CHIMERA Cultural Heritage Management (SME), Germany
- Jan Stobbe, KvNH, Netherlands
- John Smith, The Forum Trust Ltd, Norwich, U.K

- Daniel Pletinckx, Ename Center for Public Archaeology and Heritage Presentation, Belgium

During this workshop the participants decided to participate in the first Learning Group in CH, which will consist from international Expertise Centres in the sector and committed to:

- Participate in the Centres of Expertise Learning Group once per month
- In rotating locations, with a half-day presentation of activities and projects of the host organisation, and a full day learning session
- The NoEC Learning Group will be coordinated and facilitated by Daniel Pletinckx and Halina Gottlieb
- Centres of Expertise are represented by one person (in exceptional cases the representatives are 2 people)
- Group will be facilitated by a co-ordinator
- Training and coaching will be provided by CENTRIM (UOB)
- Travel expenses: contribution from EPOCH (only for one person)
- The Centres of Expertise express an interest to start-up a local learning group with local stakeholders and SMEs
- To search for additional funding from other sources

These workshops resulted in the following implementation path :

1. **Interviewing Potential Expertise Centers** by mapping the existing knowledge of the center and making a development plan for the structure of the future Expertise Center – done during the first year
2. **Defining Needs and Requirements of the Centers** by mapping the training and development needs - started the process during the workshops in Ghent and in Pisa
3. **Establishing the learning group of Expertise Centres** - done in Pisa, the learning group starts in January 2006
4. **Launching the learning group of Expertise Centres and a first networking /interaction event with ICT companies members of the EPOCH consortium** (12-13/January 2006)
5. **Set up and facilitate a learning groups with local stakeholders in the next year**, this process started at the Forum Trust Ltd, Norwich, U.K.
6. **Focus Groups for each Center**, consisting of local companies, that need to be interviewed, and where members of the focus group need to be appointed (the focus group consists of one or more persons per company that participate in the learning network, coordinated and moderated by a facilitator). The first focus group took place 9-10/2/2006 in Norwich, UK
7. **Training Facilitators** for the focus group of each Center, and for the NoEC focus group (each Center provides a facilitator who is moderator of the local focus group, the NoEC also has a facilitator). The first training session took place on 12/1/2006 at CENTRIM, U.K. In this session, Daniel Pletinckx and Halina Gottlieb, as facilitators of the NoEC Learning Group and John Smith and Bryn Davies, facilitators of the Norwich Learning Group, were trained (we chose to have one facilitator and one backup facilitator per learning group to ensure continuity and maximum availability of the facilitators)
8. **Establishing the Learning Networks** which means that regular physical meetings of the focus group are organised in the start up phase, to get people to know each other and build up trust
9. **Integrate the wider CH Community** which means that a maximum of organisations are involved, allowing other Centres to join and establish local clusters
10. **Virtualize the Network** which means that after some time, when the group is well established, most of the communication goes through the EPOCH website with fewer physical meetings
11. **Organising Observation and Evaluation** of the learning networks, and provide corrective actions if needed

The NoEC was officially launched on January 12, 2006 in Brighton with a meeting where all EPOCH SMEs and specific other SMEs that had been involved in the project (see for example the VAST2004 workshop) were invited. About 20 SMEs were present and got indepth information about the 2.8 activity and the NoEC. The companies could also present their activities and background. Through groups discussions, information was gathered about the integration of the SMEs in the CH domain, about their business models and workflows and about their expectations about the NoEC. This meeting allowed also the EPOCH SMEs to get to know each other and establish contacts with the other EPOCH SMEs.

The NoEC learning group had a first meeting on January 13, 2006 in Brighton and established the rules of conduct, the priorities and topics to work on in the second year. A total of 11 centres agreed to join the learning group (see appendix). Blair Parkin of Visual Acuity was invited to the meeting to give insight in his activities and business model, as an SME active in visualisation technology for CH. It was decided to have monthly meetings at each of the partners premises so that the activities and business model of each centre could be discussed and demonstrated, giving a much better insight in the organisation and skills of the centres and establishing human relations between the staff of each centre and the NoEC representatives. The other meetings of the NoEC in 2006 were planned. A core team was established (facilitators plus activity coordinators) to manage the organisation of the meetings and to establish the strategic vision of the NoEC.

The Norwich Forum Trust organised two focus groups on 9 and 10 February 2006. One focus group brought together local SMEs, another assembled the local CH organisations. The meetings were very successful and showed the need for a common platform. The decision was taken to start a local cluster with the partners present at the focus group meetings.

A second meeting was conducted on February 21, 2006 in Brighton. Four centres presented their organisation and their strategic plan to the group. John Smith of the Forum Trust reported on the Norwich Focus Groups. Through a creativity workshop, the group worked on an operational IT-enabled CH pipeline model where the activities and skills of the centres can be identified. Two scenarios were presented.

A third meeting took place in Giza, Egypt on 20 and 21 March 2006 at the CultNat offices. CultNat presented its premises, operations, strategic plan and goals. The meeting made major progress on defining the NoEC vision and activities. A template was made to describe the skills and activities and goals of each centre. Close cooperation was established between the two Italian centres. It also became clear that we need to start more local clusters on the short term, and that the Italian and Dutch partners are ready to do so.

A fourth meeting was organised in Ename, Belgium on 27 and 28 April, 2006. The vision of the NoEC and the profile of the Dutch partners were discussed, the organisation of the Dutch local cluster was planned, and the knowledge bank was further specified. Also the Dutch partners will cooperate closely to become one Dutch expertise centre. Visual Dimension bvba presented its strategic plan and a scenario for the recording and visualisation of archaeological sites. The sustainability and further funding of the NoEC was also discussed, and partners are working on establishing local funding for their activities.

The following meetings are planned in the third period:

- Rome, Italy (Virtual Heritage Centre Rome) : 18-19 May 2006
- Norwich, UK (Forum Trust) : 26-27 June 2006
- Paris, France (UNESCO World Heritage Centre) : 25-26 September 2006
- Nicosia, Cyprus (VAST2006) : 30 October 2006
- Stockholm, Sweden (The Interactive Institute) : 27-28 November 2006
- Den Helder, Netherlands (Kop van Noord-Holland) : 18-19 December 2006
- Jaén, Spain (CAAI) : 23-24 January 2007
- Geneva, Switzerland (MiraLab) : 26-27 February 2007

2.5.2 Deviations from plans and corrective actions

The JPA for the second period took into account that the activity would start with 7 centres and one local

cluster. Due to the vast interest for the activity, 11 centres participated in the meetings during the second period. Two other centres will probably join at the beginning of 2007, giving a geographical representation in 11 countries.

On the other hand, there is also a strong interest in starting up more local clusters. Two (and maybe three) extra local clusters will start in the third period, hence involve a lot of SMEs and CH partners at a regional level.

Additionally, it is recognised that the creating the sustainability of the Network of Expertise Centres needs more effort in terms of internal training, creating the right support structures for the local clusters and creating an internal knowledge base.

To support these activities and start-up efforts, extra budget has been foreseen in the JPA of the third period.

From March 15, 2006, Daniel Pletinckx has left the Ename Center but continued his activities and responsibilities through his SME Visual Dimension bvba.

3 Workpackage 3: Jointly Executed Research

This report describes the work carried out under WP3 at the level of the three activities of this WP, and this for the period 15 March 2005 - 30 April 2006 :

3.1 - Coordination of Research Activities

3.2 – Development of New Tools

3.3 – Common Infrastructure

List of deliverables

D3.4: The process and results of the Call for 1st generation of Newton projects (month 17)
was ready and delivered on time

D3.5: progress and plans for Common Infrastructure (including NEWTONs) (month 25)
was ready and delivered on time

List of milestones

M3.4: VAST05: WP3 Concertation Meeting (month 20) – milestone was met

M3.5: Spring meeting at appropriate event for 5th WP3 concertation meeting (+/- month 25) – was met, through meeting on 5th April at EVA Firenze, i.e. in Month 25

M3.6 VAST06: 6th WP3 Concertation Meeting (+/- month 32) - planned, but outside this reporting period.

M3.7: Newton Briefing meeting (month 21) – milestone was met, general briefing to General Assembly at VAST05 in Nov. 2005, subsequently more detailed discussions with partners involved in NEWTONs at 19-20 Dec. 2005 meeting in Leuven.

M3.9: Internal first release of selected EPOCH tools and services for testing purposes (month 20) – milestone was met: 3D webservice Leuven went on-line, MeshLab (Pisa), Fieldmap (Kent), and Castle Construction Kit V0.5 (Graz) were made available.

3.1 Activity 3.1 Coordinate research activities

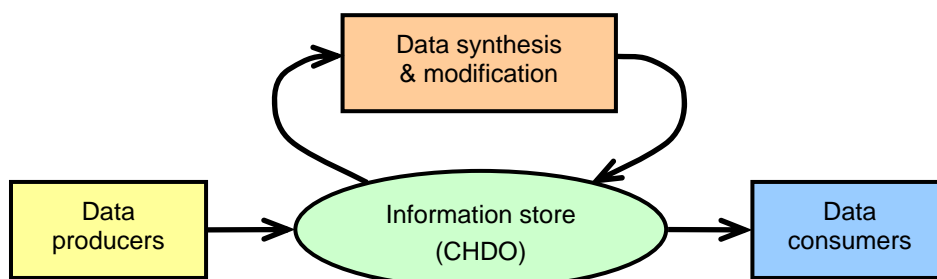
3.1.1 Objectives and starting point

Objectives

1. Organising regular consultation with Sector Watch (WP2.1) and Research Agenda (WP2.5) teams and giving feedback on technical feasibility and progress on the Common Infrastructure, in order to align technical and non-technical agendas.
2. Organisation of WP3-JER Concertation Meetings.
3. Creating links with other research projects – European and others – not funded through the Network, in a further effort to create critical mass. Similarly, acting proactively by assisting partners of the network in the bidding for research grants, at the European and national level

Starting point

At the start of this period, coordinators had already been appointed to the 7 Technical Sub-Areas of the Common Infrastructure (CI), and more specific tasks had been specified for the different partners involved (see JPA2). Also, priorities for NEWTON projects (New Tools Needed) had been identified and winning teams had been selected among those bidding. Originally, the CI was thought of as a ‘pipeline’, but this approach had already been revised in favour of an information processing view, as explained in Deliverable D.3.3.2. This information processing is illustrated in the figure below: all the data is available in the information store and tools are generating/manipulating this data. In this view, a cultural heritage application is a set of tools, which are linked together by exchanging information. Apart from the further development of specific tools, this scheme has been elaborated further during this period. NEWTON projects were only to start in the next period.



At the start of January 2006, tasks had been defined for the partners involved in both the Common Infrastructure and the NEWTONs. WP3 coordinator Leuven had proposed an approach towards interoperability, based on Cultural Heritage Data Objects. This approach envisaged the selection of existing standards for 1) 3D data, 2) non-3D multimedia, and 3) semantic information and metadata. Rather than turning any of these into a kind of ‘master format’ to which the other data would be appended and which would also cease to be consistent with the existing standards, information of the aforementioned types would be combined into a Cultural Heritage Data Object, CHDO, based on a well-chosen container format. Also for container formats there is an ample choice of existing schemes.

Work on the CI had started already, but needed to be extended. Work on the NEWTONs had to start at the beginning of 2006.

3.1.2 Progress and achievements

Workpackage 3 coordinator Sagalassos Division (with both archaeologists and engineers) has a team (prof. Luc Van Gool, prof. Luc Van Eycken, Tjil Vereenoghe, and from this period onwards further reinforced by Bert Deknuydt) working on the WP3 coordination. This team has undertaken the following activities, helped by the other WP3 partners:

1. Organisation of several Activity 3.3 meetings, to define the principles governing the EPOCH Common Infrastructure, as well as the more detailed architecture and implementation thereof. (23rd March @ CAA05 in Tomar, 8 Nov. Pisa, 19-20 Dec. 2005 in Leuven).
2. An update of the deliverable D3.1.1 was produced, in reply to the June 2005 review, updating this ‘overview of Cultural Heritage related IT research, related to stake-holder needs and the position of Europe therein’.
3. The NEWTON selection process was finalised at the beginning of this period, by proposing the outcome to the Board of Directors on the 21st of March 2005, and by communicating the results for the first time to the partners at the EPOCH General Assembly meeting on March 24th (CAA05, Tomar). The week after, a mail was sent to the partners who submitted a proposal about the detailed background for the decisions regarding their proposal. Those involved in a successful bid were asked whether they wanted to go ahead irrespective of the budget cuts, and what parts of the projects they would possibly propose to be eliminated or reduced. For the 3 cases where two bids were merged into a single project, a coordinator for the merger has been appointed. The partners’ response has been very positive. All accepted to go ahead. Most teams wanted to go ahead without any major change to their project and where mergers were proposed, partners welcomed such move. Deliverable 3.4 was produced, documenting the NEWTON selection process and its outcome.
4. Tijl Vereenoghe – archaeologist at the Sagalassos Division – attended Stakeholder Needs and Technology watch meetings of WP2, coordinated by the Ename Center, on behalf of WP3.
5. Tijl Vereenoghe also took on a more active role in supporting the maintenance of the EPOCH webpages, by producing WP3 webpages as to assist WP4 management with this extensive task.
6. A discussion group on 3D related standards and formats (via e-mail) has been started, coordinated by Sven Havemann (Graz Un.). The main conclusions were to support both X3D and Collada – both XML-based as 3D data formats – and OpenSG for rendering.
7. The WP3 coordination team at Leuven University has elaborated an approach towards the interoperability of tools. This approach starts by first trying to fix standards / formats for the basic data types in 3 areas: (1) 3D models, (2) multi-media objects other than 3D models, and (3) semantic information and metadata. Rather than turning any of these into a kind of ‘master format’ to which the other data would be appended, information of the aforementioned types would be combined into a Cultural Heritage Data Object, CHDO, based on a well-chosen container format. This approach was to be further discussed by the WP3 Management Committee during period 2. This management committee consists of the Leuven coordination team, and the 7 subarea coordinators. These coordinators are:
 - 1/ *David Arnold* (Un. Brighton): Multi-lingual and semantic data processing
 - 2/ *Achille Felicetti* (PIN): Databases and knowledge management
 - 3/ *Nick Ryan* (Un. Kent): Mobile-wearable-ambient systems
 - 4/ *Paolo Cignoni* (CNR): Recording and data representation
 - 5/ *Sven Havemann* (Un. Braunschweig): Visualisation and rendering
 - 6/ *Halina Gottlieb* (TII): Multi-modal interfaces
 - 7/ *John Glauert* (Un. East Anglia): Virtual humans and avatars
8. The WP3 coordination team helped to organise courses, in collaboration with WP4. For instance, at the joint UNESCO-EPOCH summer school in Mexico, the EPOCH 3D Webservice was demonstrated.
9. Took on some of the liaison activities with respect to other 6FP projects (ProLearn, WalkonWeb, Pascal, Cyberwalk, Bricks, etc.). The WP3 coordinator also established contacts with the DigiCult partners, which in this period has led to DigiCult partner Salzburg Research joining the project. This has assured that the important information collected and analysed by this former project could flow into the related EPOCH activities. Salzburg had an impact on JPA2, and will have even more so on

JPA3, where they enter with a formal budget. This has further strengthened our overview of past and ongoing activities and of the Stakeholder Needs.

10. Organisation of several Activity 3.3 meetings, to define the principles governing the EPOCH Common Infrastructure and NEWTON projects, as well as the more detailed architecture and implementation thereof. (5th April at EVA Firenze). At the Firenze meeting the CHDO approach was discussed with the partners, and was approved in principle.
11. In collaboration with WP4, 4 WIKIs and mailing lists were set up to coordinate the discussion on the standards / formats for (1) 3D data, (2) non-3D multimedia, (3) meta-data, and (4) containers. A coordinator was appointed for each of these (1) Sven Havemann, (2) Bert Deknuydt, (3) Franco Niccolucci (after Tyler Bell declined), and (4) Luc Van Eycken.

The WIKIs may be accessed at:

http://partners.epoch-net.org/common_infrastructure/wiki/index.php/Main_Page

12. A document was composed to summarise the current state of container formats (Bert Dekmuydt and Luc Van Eycken). This document was intended to jumpstart the discussions on the container formats. On this subject contact was also sought with C2RMF, an organisation giving technical support to the French state museums, in order to confront our conclusions about container formats with the practical experience of this influential organisation. In the meantime, the partners have voted to add them to the EPOCH consortium as full partners.
13. Leuven has refined – with help from the different partners involved – the 3 scenarios that will be used to demonstrate CI and NEWTON tool compatibility.
14. Deliverable D3.5 has been produced, that summarises the CHDO approach, as well as the progress made on the CI and the NEWTONs.
15. Together with the Interactive Institute (Halina Gottlieb, Stockholm), WP3 coordination is preparing the Interactive Salon, where the general public will be able to see and experience part of the EPOCH tools. More importantly, this event will serve as a several month long exhibition of modern IT technologies to museum professionals and as a training event for students, who want to learn to work with the tools.
16. The Leuven WP3 coordination team helped to organise courses. Tjil Vereenooghe e.g. demonstrated the 3D webservice tool at a special Epoch session at CAA06 in Fargo and at the Regional Meeting in Krakow (Jan 2006), and Luc Van Gool gave an overview of CI tools to the NoEC representatives at the EVA06 meeting. This was in collaboration with WP4 and WP2, respectively.
17. Leuven took the initiative to present both Agamemnon and EPOCH results for visual object recognition and localisation, at the Workshop on Intelligent Mobile Vision (13. May), adjacent to the European Conf. on Computer Vision 2006 in Graz. This workshop was co-organised by Leuven. This initiative was timely, as Agamemnon is nearing its end.

3.1.3 Deviations and corrective actions

Standardisation and formatting issues – also the topic of WP4.2 – needed to be accelerated, as the consortium was for the first time developing and implementing new tools during this period. Bert Deknuydt was added to the Leuven coordination team to take responsibility for the non-3D multimedia data and the container formats.

Due to delays in approval of JPA2, the start dates of the NEWTON projects were put back from Month 19 to Month 22, although the start-up meeting went ahead in December 2005 for preparation purposes.

3.2 Activity 3.2 Development of New Tools

3.2.1 Objectives and starting point

Objectives

Objectives in JPA2:

1. To follow-up the 1st generation NEWTON projects
2. To ensure the successful integration of their results into the Common Infrastructure
3. To possibly launch a call for 2nd generation NEWTONs, in response to further or remaining priorities on the Research Agenda

Starting point

The EXC had ensured that the NEWTON selection process had almost been completed by the start of the reported period, but some final steps remained to be taken.

After the NEWTON and WP3 management meeting on the 19-20 Dec. 2005, the NEWTONs were ready to start at 1st of January 2006 (except for UPGRADE).

3.2.2 Progress and achievements

The entire NEWTON selection process – including the remaining steps carried out under the reported period – and its outcome are described in deliverable D3.4 The process and results of the Call for 1st generation of NEWTON projects, also produced during the reported period.

A more detailed description of the goals, deliverables, and milestones of the different NEWTONs is given in D3.4 as well. Here we only give a short overview of the planned NEWTON projects, also to demonstrate that through these projects more than 30 partners will be involved and get funding through WP3.

- 1) **3DKIOSK**: 3D processing, from capturing to visualization

The goal of this project is to make the integrated use of acquisition and showcasing 3D technologies easy for museums. The project is structured in two components: acquisition and showcasing.

For the acquisition part the Epoch 3D Webservice is a major component. The idea is that users can upload images to a server. The server turns these images into a 3D model, as automatically as possible. The creation of individual range maps for the different images is based on software from Leuven and is already available as part of the Common Infrastructure. During this period, integration with the 3D patch registration and decimation software of CNR-Pisa (MeshLab) has started. The latter software has also been released in isolation, under GPL open source license. Also, different aspects of both parts of the software have been improved and it has been adapted to support X3D and Collada, in agreement with the outcome of the 3D format discussions.

The showcasing part has started to build a common software framework for the different rendering techniques. The OpenGL scene graph has been chosen as a common framework and the various partners are integrating their technologies under a specialized node of this architecture. ISTI-CNR has provided state-of-the-art technologies for the interactive visualization of massive triangulated models using out of core multiresolution structures. TU-Graz, has integrated the scripting/modeling language, the Generative Modeling Language (GML), into OpenGL.

- 2) **AMA**: Open Source tool for mapping datasets to CIDOC-CRM form

The partners have selected archives to be mapped to CIDOC-CRM as test cases (PIN, CIMEC, ROB, IAA). Tools proposed for documenting the data models have been evaluated. A survey on documentation standards in museums and sites has been designed and is planned to have been finalized by the end of May. UNIREL and VARTEC proposed a first design of the mapping tool, including screenshots of prototype interfaces (still with limited functionalities), which were accepted by the team. A first mapping prototype is expected by mid June.

3) **CIMAD**: Configurable framework for smart CH environments

CIMAD stands for *{Common Infrastructure, Context Influenced} Mobile Acquisition and Delivery of CH Data*. The CIMAD target is the conception and development of a demonstration framework for building and running mobile CH applications in smart environments at any stage of the EPOCH “pipeline”, at the data capture and dissemination stages.

A general CIMAD architecture has been defined. Mobile, context aware web applications will be created with the support of an Application Builder. The Context Management Infrastructure is provided by MobiComp2, under development as a contribution to the Common Infrastructure. The context-aware behavior of the expected applications is enabled by “Context Matching Rules” to be specified for each application using the Application Builder. Specified EPOCH Standards will be adopted where appropriate (data, metadata, transport and communication). Suitable mobile platform architectures are being considered.

4) **IMODELASER**: Integration of laser scanners and imaging devices for 3D modeling

The church of Agios Nikolaos (Crete) has been selected as a test case. For the modeling 45 images have been used. After the image acquisition and the surveying of the object by means of a total station, the images were oriented to recover the camera poses and 3D object coordinates of some homologous points. Afterwards, other points as well as edges are identified in the images to completely reconstruct a virtual 3D model of the church. Due to the complexity of the object and the absence of well defined corners and edges, all the measurements are performed manually.

Simple 2.5D triangulations generate a topologically incorrect surface model. Thus, a 3D triangulation (Tetrahedralization) followed by surface extraction from the volumetric convex hull is required, for which ETH has developed a (partial) solution.

In future work, the combination of edges measured from the oriented images, and point cloud data from laser scanning will be integrated in order to benefit from the advantages of both sensor systems.

5) **CHARACTERISE**: (formally called VIRTUMAN): Creation of a Scene Population Toolkit

The workplan involved the open-source release of several key software libraries for the VHD++ VR/AR Real-Time Character Simulation framework, by UNIGE and EPFL. A subset of these “to-be-released” libraries is scheduled for early pre-release, so that UEA can already design their modules in a manner which is both interoperable and compatible to the VHD++ framework. EPFL is preparing the deployment of the VHD++ kernel by setting up a repository of both source code and documentation as well as preparing tutorials helping UEA and other partners to develop their own components within the VHD++ platform. EPFL

3.2.3 Deviations and corrective actions

The EXC had ensured that the NEWTON selection process had been completed earlier than originally foreseen, so that these projects could, at least in part, have started already during this period. Due to the delays experienced following the end of Year 1, it was judged better to let these projects only start in January 2006, which is a bit later than foreseen in the original JPA2 (month 22 rather than month 19). The selection process and its outcome are described in deliverable D3.4, produced during the reported period.

All NEWTONs have started their work, except for UPGRADE, which is concerned with underwater archaeology. UPGRADE partners proved quite difficult to reach at times, probably due to off-shore activities. In any case, UPGRADE was represented at the NEWTON kick-off meeting through ISME’s Giuseppe Conte. The further integration of some partners through the start-up of the NEWTON projects has led to requirements for instructions on financial aspects of involvement in the project, as they had not previously held budget or received pre-financing payments. Following some initial delays, any difficulties experienced have been resolved.

3.3 Activity 3.3 Common Infrastructure

3.3.1 Objectives and starting point

Objectives

Objectives in JPA2:

1. To define the overall architecture and constituent components of the common infrastructure
2. To evaluate a limited set of existing tools as constituent components.
3. To identify (with Activity 4.2) the standards to which the common infrastructure should conform and in particular required data types, formats and interfaces to existing systems to which the components should interface

Starting point

JPA2 already contained tasks to be carried out by the different partners working on the Common Infrastructure (Section 9.6.3). These tasks were based on a list of priorities selected for CI implementation as part of the Research Agenda and the subsequent poll among partners about the best strategy to achieve them. The following topics had been selected for development under the Common Infrastructure:

1. tools for conversion of existing catalogues (JER sub-area 1)
2. multilingual systems for collection interrogation (JER sub-area 1)
3. link repository for 3D primary data (JER sub-area 2)
4. multi-modal data retrieval (JER sub-area 2)
5. integrity management of presentation data (JER sub-area 2)
6. internet portals based on distributed systems (JER sub-area 2)
7. contextual cultural information (JER sub-area 3)
8. supportive measures for mobile applications (JER sub-area 3)
9. 3D file format compendium (JER sub-area 4)
10. large cultural and natural heritage sites (JER sub-area 4)
11. unified framework for 3D applications (JER sub-area 5)
12. avatar standards for cultural heritage (JER sub-area 7)

(for each of these a more detailed description is available in the document on priorities for the Research Agenda).

So the task during this and the next two 6-month periods mainly consists of elaborating the tools identified as part of the Common Infrastructure and ensuring that they are interoperable over the range of expected datatypes.

3.3.2 Progress and achievements

3.3.2

Progress and achievements

Apart from the specific implementation work on the different CI tools, additional activities took place. These include the setting up of discussion platforms for standards and format issues. Initially a mailing group for 3D standards was established, later followed by WIKIs and mailing groups for multi-media, meta-data, and for the CHDO container representation. Moreover, three tool chains were defined, through which the inter-operability of a large number of the CI tools would be demonstrated (for more detailed info see D3.5).

During the first period of the project the common infrastructure effort was directed at surveying and assessing currently available technologies with emphasis on open source tools and those tools which had resulted from other research leading to pre-existing know how (PEKH). Implementation work was in effect combined to integration of existing tools used to showcase concepts and undertaken under Activity 2.4.

In what follows a short overview of implementation work in this period is given, structured under each technical subarea (again, more detail is given in D3.5).

1) **Multi-lingual and semantic data processing**

In multilinguality Brighton is investigating and extending in-house the use of the HEREIN multilingual thesaurus for Cultural Heritage, as well as building a multilingual parser. Natural language generation experiments are also being undertaken. In Semantic Data Processing (SDP), they are encoding the data used in EPOCH showcase 4 into CIDOC-CRM. A basic interface for Question and Answering is developed under the JENA framework and RDQL (RDF Data Query Language). In SDP, the start of JPA2 was dedicated mainly to using tools, such as PROTÉGÉ, to manipulate and get familiar with CIDOC-CRM, for which a simple transport format (Resource Description Framework) has been selected.

Brighton has applied and developed Natural Language Processing (NLP) techniques for integration into their general, multi-lingual framework for assembly and presentation, the development of which had started in the previous period. This has meant the development of a prototype multilingual natural language front-end, which generates natural language responses enquiries, where the knowledge base is encoded using CIDOC-CRM. This language can then processed by speech generation systems.

There has been a close interaction with two NEWTONs. With CHARACTERISE because this work provides the NL interaction with the avatars. With AMA because of the automated tool developed for mapping CH data into CIDOC-CRM. In particular, discussions with regards to mappings other than from museum collections (e.g. cities and excavations) are currently taking place.

2) **Databases and knowledge management**

The system for archaeological documentation management based on eXist conceptualised in year 1 has been fully implemented. The goal is to develop a product usable by heritage professionals with little technical skills to substitute for commercial products, whilst being fully XML-native and supporting Xquery. The creation of the tool is part of the strategy fostering mapping of archaeological documentation to CIDOC-CRM (cf. the planned AMA Newton), enabling migration, if desired, and providing tools for the management of the documentation after conversion to the standard.

The archaeological documentation management system implemented during the initial period, was then extended with several features, facilitating its use:

- The system can accept a generic DTD/Schema and generate the database accordingly. Page layouts for standard data models are being created.
- The system implements a visual interface to build queries, aimed at non-technical users, based on any combination of conditions on “fields”, i.e. XML elements.
- A fast search tool is available.
- Data collections may be distributed. The locations of relevant collections (URI) are listed in a configuration file. (This feature is experimental.)
- Complete management/editing of documents (input, change, etc.) has been incorporated into the system (previously documents had to be edited using an XML editor and then uploaded in the database).
- Optionally results may be output as PDF documents.

Draft documentation of the system is also available.

3) **Mobile-wearable-ambient systems**

Prior to the start of EPOCH, UNIKENT had developed *MobiComp*, a prototype support infrastructure for smart environments and context-aware applications. As part of the evaluation of this infrastructure, an initial version of the *FieldMap* data collection tool was developed. FieldMap enables archaeologists and other field scientists to carry spatial data into the field using a handheld device, to collect new data, and to access remote, web-based resources whilst in the field. Within the first 6 months of JPA2, UNIKENT developed a public release of an improved version of FieldMap, building on established and continuing collaboration

with the new EPOCH partner 84 RUG (Rijksuniversiteit van Groningen). This collaboration continues and will form part of the evaluation of the Newton project *CIMAD*.

ARCES has initially concentrated on background research, prototype design and implementation of components to support visitor guides through multimedia mobile devices. In particular:

- MobiComp Tracker, Aggregator, and Listener components for experimental sensors and location solution are currently used at ARCES
- Prototype middleware has been developed for sensor integration at system level
- Prototype middleware has been developed for integration of 3rd party sensors within MobiComp
- Remote wireless (Zigbee, Bluetooth) sensors for improved user activity recognition and wearability are in use
- Sample calibration and integration procedures for sensors in mobile devices are available
- HCI components for on-site tours have been designed

During the 2nd 6 months of JPA2, FieldMap development concentrated on ensuring import/export compatibility with several widely-used GIS systems and, in parallel with similar work on MobiComp, migration of the code base from the outdated Personal Java (jdk 1.1.8) specification to the more recent J2SE and J2ME specifications. The system now runs on desktop and laptop machines, as well as a range of handheld devices under the J2ME Personal Profile. An experimental implementation is under way to enable a reduced version of FieldMap to run on Java-enabled mobile phones.

During the second half of period 2, additional technical work has been done by ARCES on:

- Improved HCI components (Panorama viewer, vocal interfaces, 3D engine)
- Porting of localization software to Windows Mobile OS.
- Demonstration of prototype remote wireless sensors
- Tracking algorithms based on remote wireless sensors
- Mixed mode (GPS/WiFi) localization techniques for indoor/outdoor environments
- Exploratory analysis of power consumption in mobile devices and context-based power management solutions

ARCES and UNIKENT have begun a close cooperation on establishing an updated version of MobiComp as a key component of the CI support for mobile, wearable and ambient systems. Work on providing a more formal basis for MobiComp has begun, with UNIKENT working towards new J2SE and J2ME implementations to be known as MobiComp2 and scheduled for completion early in year 3. The main thrust of the joint effort is in specifying an extensible XML Schema and OWL ontology for the language used in communicating and storing contextual information. Existing components developed at ARCES and UNIKENT will be adapted to this new model.

4) **Recording and data representation aspects**

The main objective of this subarea is to provide a pipeline of processing tools, going from 3D data acquisition up to clean 3D models.

3D Webservice

This tool by Leuven produces 3D patches from normal photographs. At the start of JPA2, the service has been brought on-line for free, non-commercial use by registered users in the area of Cultural Heritage. Users can upload images to an Epoch server and get 3D reconstructions sent back through e-mail. For that purpose, a user manual has been written, X3D and Collada support have been integrated, and GUIs were developed to assist the user.

The main progress made since the launch of the 3D Webservice has been the inclusion of more powerful wide-baseline matching techniques on the server side. This allows the system to start from images that are taken farther apart. From the previous period, it became clear that users tend to upload such images, even if the manual strongly suggests not to. Wide baseline matching then still allows the software to find matches,

and to bootstrap itself from there. Hence, several image sets that could not be handled with the initial version of the software, can now be dealt with successfully. Features co-developed by Leuven and ETH Zurich are used for this purpose.

MeshLab

3D datasets from scanners or the Epoch 3D Webservice require tools to process their large unstructured meshes. Partial meshes usually need to be merged into a single well shaped mesh, with a resolution and complexity appropriate for the application. Similarly cleaning operations (removal of unimportant parts, noise) often have to be performed on the meshes. At the start of Epoch, no such free tools were available. This has been remedied through CNR-Pisa's MeshLab, which has been made freely available.

The MeshLab system acts as a *glue* among the various 3D applications in the Epoch network. From January 2006 version one of this tool is also available to the community, and since then, it has been regularly updated and improved. The current version (0.7) is able to:

- manage large sets of unstructured 3D data (meshes of 10M triangles can be loaded and processed)
- perform cleaning operations almost automatically over large unstructured meshes
- import, convert, simplify and export meshes in a variety of formats.

Procedural modeling

In this subarea we also investigate the interactive design of 3D models. The efficient creation of such models is a crucial task in cultural heritage since lots of artefacts or environments are completely destroyed and cannot be reconstructed by scanning. Thus the models have to be created from partial evidence in a CAD-like environment i.e. based on plans, paintings, rules etc. ETH and Graz are developing tools for procedural content creation:

(1) *GML* by Graz is a low-level language to capture the description of procedural shapes. It is freely available and currently browser plug-ins and a scene-graph integration are developed.

(2) The *CityEngine* by ETH Zurich is a tool for the procedural modeling of architecture. A novel shape grammar has been introduced and the software development is in its final stage. This system has also been evaluated through two collaboration projects with archaeologists (Pompeii and Xkipche). The current version (2.9) is able to:

- 1) evaluate and interpret many classes of architectural rule (a library with a rule set for classical architecture, which is relevant to cultural heritage, is already available and can serve as an implementation example);
- 2) create large-scale city models as well as very detailed building models;
- 3) perform rule-based distribution of (urban) vegetation;
- 4) interactively explore and modify models through a sophisticated user-interface;
- 5) import and export GIS data.

A library of detailed and/or large-scale models is online and available to the different partners for performance and integration testing. Collaboration between both tools are being planned for period 3.

5) **Visualisation and rendering**

A 3D Task Force was established (in collaboration with subarea 4) (i) to establish OpenSG as a common rendering platform, and (ii) to agree on a common 3D file format for:

- *Storage (long-time archival)*
Solution: Collada or X3D, both XML based
Status: Fundamental issues resolved, first implementations underway

- *Rendering* (3D application framework)
Solution: OpenSG
Status: resolved, solution is promoted within the consortium
- *Processing* (documented process chain)
Solution: Shape processing tools
Status: Tools available for meshes (Pisa MeshLab)
Pending issue: Standard way of process documentation

The adoption of OpenSG has gained great momentum during this period, as implementation work progressed. Several partners have ported their visualization software to OpenSG and others have started to do so. Most notable examples:

- Massive multi-resolution meshes from Pisa
- BTF-rendered models from Bonn
- Subdivision surfaces from Braunschweig
- GML models from Graz
- 3D Web service viewer from Leuven (GUI uses OpenSG, supports Collada and X3D)
- Animated avatars from Norwich, but still underway
- Procedurally generated urban environments from Zürich

For the further promotion of the common interactive rendering platform, it was decided to develop two sets of tutorials:

- *Extending OpenSG* demonstrating the exemplary integration of a few representative custom shape representations. This tutorial is available.
- *Using OpenSG* demonstrating the rapid development of complete 3D applications. This tutorial is still under development.

A larger-scale integration has started in the meantime, that involves several partners. ETH Zurich's CityEngine viewer will be based on the OpenSG 3D engine and will investigate new approaches for architectural level of detail handling. Especially for cultural heritage (i.e. classical architecture with very detailed and richly decorated models), high-performance level of detail techniques are crucial for a convincing real-time visualization. In the viewer, several contributions of other partners will be integrated, e.g. (1) the OpenSG integration of GML provided by Brighton, (2) GML-based level of detail provided by Graz, and (3) massive mesh rendering methods provided by Pisa. Development started in February 2006 and in its current state, OpenSG evaluation has been finished and basic model import procedures have been implemented.

A Collada importer/exporter for OpenSG, which is also capable of robustly reading/writing XML annotations, is currently being developed as an important part of the Epoch visualization infrastructure.

6) Multi-modal interfaces

The Interactive Institute has been undertaking ongoing investigations into current museum applications of interface technologies. In order to reduce the cost, the study has been limited to the Nordic countries. They have included science centers, research institutes, heritage sites and nature, art and culture museums. Overall, more than 30 institutions were involved. The Interactive Institute have generated an overview of the kinds of interfacing technologies that have been used or experimented with. The conclusions about their actual usability will be collected in the upcoming period. Interesting cases have been identified for the different types of CH organisations.

Based on the experiences gained through this investigation, as well as on its own intensive expertise with multi-modal interfaces for the CH sector, the Interactive Institute is planning the Interactive Salon, to be organized in the autumn of 2006, in Stockholm. The goal is to showcase multi-modal interfacing techniques and concepts, particularly to museum staff and students in CH. The Salon is also meant to become a meeting forum for CH content providers, SMEs and users. Discussions with

EPOCH partners to see which of the EPOCH tools and tool chains could be shown at the Salon are still ongoing.

On the technical side, Brighton has created a CH presentation testing environment, which includes a large-scale, multi-screen presentation wall, supported by a PC cluster and incorporating eye-tracking technology and multi-track video recording. The facility, which has been funded from outside EPOCH, is expected to be fully installed and ready for conducting usability experiments in the Autumn. ETH has designed a HMD-based visualization setup, where a Vicon tracker interface has been integrated into OpenSG.

7) Virtual humans and other avatar technologies

The Avatar Research Platform (ARP) technology has been rewritten for future proofing (.NET) by UEA. The ARP toolkit had a lot of development in terms of import and export capabilities, allowing models, skeletons and motion data to flow to and from most mainstream modeling applications (incl. Maya, 3DSMax, MotionBuilder, SoftImage).

EPFL and UNIGE have been actively working towards releasing the basic components of their VHD++ platform as open source, for the EPOCH community. In particular, EPFL has been handling the migrating of code sections of the VHD++ platform ensuring that no legal issues prevent the use of the VHD++ platform by the EPOCH community. When completed, the migration of the source code will permit the deployment of the VHD++ platform under the LGPL license for a wider distribution to the EPOCH community. EPFL and UNIGE have also been preparing additional material such as documentation and tutorials to improve the adoption and learning curve with the system.

Several other technical advances have been made. The use of the graphics card processor for deforming the virtual human mesh structures has been investigated with promising performance improvements (on supported hardware). Vertex and pixel shaders for increasing the variety in the virtual characters have been implemented.

To remove a manual process in the display of virtual humans, an automatic method of creating billboard/impostor images and simplified human meshes has been developed.

To control the behaviors of virtual humans, a data-driven method for generating basic virtual human emotions with and added variety in their animation has been developed.

Automatic techniques for crowd placement and navigation in city scenes have been developed and presented at VAST2005. These are based on processing the 3D scene into 2D maps to indicate areas of the scene that can be immediately accessed or navigated toward.

EPFL and UNIGE investigated alternatives for 3D formats, and proposed that the COLLADA (COLLABorative Design Activity) standard be used as the 'native' format for both virtual humans and scenes. COLLADA has native support for virtual human data structures and can also be extended to facilitate the interchange of other data required in our virtual worlds such as terrain height maps, occluder shadows, metadata, etc. This proposal has been accepted by Epoch and other tools have been extended to support both Collada and X3D, or will be in the near future.

OpenSG has been revisited from an avatar point of view, but issues still remain with the dynamic nature of virtual humans (memory overheads, rendering speeds, synchronization of audio and visual components important for speech, and the updating of the positions of dynamic objects causing the humans to disappear or appear incorrectly). Finding solutions or alternatives is an ongoing investigation.

3.3.3 Deviations and corrective actions

Given the relatively immature level of standardisation and shared formatting which was exposed in the standards reviews in period 1 and the key role that standards need to play in the common infrastructure, it was decided to reinforce our investments in the standardisation studies and efforts (jointly with WP4.2). Therefore the WP3 coordinator has added ir. Bert Deknuydt to the Leuven WP3 coordination team.

There are no major deviations to be reported, except for the multi-lingual domain, where the effect of IBM's non-accession to the contract is still being felt. The situation has been considered at the Workpackage and Executive Committee levels and although it could be said that the availability of multi-lingual solutions is very important, particularly for engaging socially disadvantaged groups or children, the implementation (e.g. via audio-guides) may be less critical for current uses of technology in current museums. However, usable systems produced from the work on avatars could lead to a situation where this aspect of the research would need to have been completed. As the uptake of applications with automatic NLG is not anticipated to be at a level where this is an issue within the life of EPOCH, the decision has been taken to restrict activity to tracking the area and experimenting. The Executive Committee will consider a possible extra injection into this subarea as part of applying unallocated funds in the JPA3 plan should progress in the semantic data processing reveal real potential for a useful tool in the area of conversion of legacy catalogues.

4 Workpackage 4

This report describes the work carried out under WP4 at the level of the four activities of the WP, and this for the period 15 March 2005 - 30 April 2006:

4.1 – Web site

4.2 – Standards

4.7 – Human resources development and events

4.8 - Publications

List of deliverables

D.4.9. State-of-the-Union for IST in CH (SOTU), due 15/03/06. The deliverable was delivered on time. It consists of an extended table of contents of the issue 2, with abstracts of the planned articles. The full text of the book is expected to be ready in June 2006.

D.4.10 Standards and their roles in EPOCH, due 15/03/06. The deliverable was delivered on time. It consists of a summary report of the activity plus extended appendices detailing the most relevant achievements.

4.1 Activity 4.1 Web site

4.1.1 Objectives and starting point

Objectives

1. Re-design of the project web site in order to improve accessibility and ease of use by partners and by the public.
2. Improvement of access bandwidth and service reliability with the outsourcing of server hosting.
3. Creation of an on-line management tool.

Starting point

At the beginning of the period, the project had already opened a web site including a reserved area for partners, with services for joint activity. However, it appeared that the easiness of use and comprehension of the project goals and results could be improved by adopting a different approach, describing them in terms of the user's perspective instead of the institutional view as yet adopted, and usual for project web sites. An emerging issue concerned the bandwidth of the server, which also needed improvement. Other concerns regarded the maintenance of the site and the related services that were almost inaccessible during the summer closure period, when a hardware problem might stop the service for several days with no possibility of intervention.

Finally, the coordinator requested support for the creation of an on-line management tool to facilitate the transmission of the interim management, finance and effort reports by the activity and WP leaders.

At the beginning of January 2006, the web site had already been re-designed and implementation was ongoing. The server had been successfully relocated at a hosting service. A preliminary version of the on-line management tool was being developed.

4.1.2 Progress and achievements

To achieve a better service, it was decided to outsource the hosting of the server, moving it to an externally managed one. This could guarantee a theoretical bandwidth of 1 Gb, hardware maintenance 24/7 and – as before – the possibility of software maintenance vis SSH. The migration was completed satisfactorily in the

month of September 2005. The outsourced service has continued with no interruption since then, and the provider has confirmed to be experienced and very reliable. A number of hacker attacks have taken place during this period, mainly with the goal of installing a chat server and/or a spammer. Two successful attacks have taken place during the weekends, availing of security holes in the Apache operating system, but the service has been promptly cleaned and restored by joint action of the hosting provider and the EPOCH web site team.

Re-design of the site started in October 2005, with a preliminary sketch presented at the reviewers of the interim review (early November 2005). After an extensive discussion on the new features, an implementation of the new version started by the end of the year.

In the month of November 2005 the web team started to design the online management tools according to the project reporting requirements conveyed by the Brighton management task force.

The new version of the web site was implemented in February 2006, and after a test period has substituted the previous one. The new version aims at providing a more structured access to information and adopts a language and a perspective closer to the users' interests. For example, it includes a series of thematic channels corresponding to different user profiles and interests. A friendlier tone has also been adopted, for instance presenting the people behind the project and aiming at the involvement of the user as a perspective member of the EPOCH community.

The on-line management tool has been implemented and tested and is now fully functional. It is now ready to be used for the network management from the beginning of Period 3.

4.1.3 Deviations and corrective actions

There were no major deviations in this Period and minor ones are included in the section on progress and achievements.

4.2 Activity 4.2 Standards

Note. The activity on standards is extensively reported in the deliverable D.4.10, to which reference may be made for additional details. Some excerpts of D.4.10 are included below for the sake of completeness.

4.2.1 Objectives and starting point

Objectives

1. Promote the use of international standards within the Network and in the scientific community.
2. Make standards more accepted by providing tools and training.
3. Support best practices and related initiatives.
4. Analyze and provide solution for usability and accessibility.

Starting point

Activity on standards had been acknowledged at the end of year 1 as a foundation of EPOCH on which the Network's engagement should receive additional impetus, particularly as far as documentation and technological standards are concerned.

At the end of 2005 all the planned activity on standards had started and was ongoing. This included documentation standards (linked also to the AMA NEWTON) and the related surveys and documentation; technological standards, aiming at the definition of an "EPOCH information object", this also related to WP3; accessibility and usability, with the ongoing surveys; Charters and credibility, the latter being an issue raised at the VAST2005 workshop.

4.2.2 Progress and achievements

EPOCH's activity on standards has included a number of events. It started with a workshop at CAA2005 in Tomar (March 2005) and continued with a workshop at VAST2005 in Pisa in November 2005.

Training activity on standards includes a Summer School on "Standards in Archaeological Documentation" held in Prato in June 2005, see below. A tutorial on CIDOC-CRM was held at CAA2005.

At **CAA2005** (Tomar, Portugal) a session of standards has taken place (23 March 2005, <http://www.caa2005.ipt.pt/I9Abstract.htm#Standarts>). The session was jointly organized by EPOCH and the University of Berkeley, with the participation of outstanding researchers from Europe and USA. During this session, participants discussed main issues concerning the current adoption (or, better, non-adoption) of standards for archaeological documentation and established an agenda for further work. Besides, several papers on standards were presented by EPOCH partners in the plenary (so-called "I9action session") on standards.

At **VAST2005** (Pisa, Italy) there has been a workshop on standards (8 November 2005 - <http://vcg.isti.cnr.it/vast05/program.php>). Discussion here has focused on technological standards, with a discussion paper presented by Sven Havemann on Collada (the emerging open standard Digital Asset schema for interactive 3D applications, <https://collada.org>), and on issues of credibility of archaeological reconstructions, with two position papers by Franco Niccolucci and Richard Beacham. Some 50 people have attended the workshop.

As a result, an on-line discussion on 3D technological standards has been opened within EPOCH with the creation of a 3D Task force (also working under WP3.3 as far as Common Infrastructure issues are concerned) and the establishment of a wiki summarizing the outcomes of the discussion.

As far as the other thread (credibility) is concerned, it appeared that work was indeed still necessary to establish accepted credibility criteria, and general guidelines were much needed, involving not only the archaeological community, but also researchers from other areas who might contribute methodologies for recording the actual process of interpretation and archaeological reconstruction. To proceed in this line, a further meeting was planned, to be jointly organized by EPOCH and KCL in London in early 2006.

In Pisa, it was also concluded that technicalities necessarily involved in standards do not facilitate heritage professionals: thus EPOCH's activity needs to produce introductory material and include into discussion concrete examples showcasing the usefulness of standards.

Research on standards has concerned three sub-domains: documentation standards, technological standards, usability and design.

Activity on documentation includes the commissioning of a study on the use of standards in CH following a preliminary survey. A mapping exercise has been performed on official documentation systems used in Italy, and it is due to continue on those adopted by other European countries. The goal is to verify the possibility of mapping such systems to CIDOC-CRM, the draft international standard for heritage documentation.

As far as technological standards are concerned, the preparation of introductory guidelines to SVG and X3D has been committed in order to support non-technical users, while a third 3D standard, COLLADA, is the subject of attentive analysis, to produce an "EPOCH profile" for 3D heritage objects.

Surveys on usability and design have started with an on-line questionnaire.

Work on the Ename Charter has continued, also including an International Symposium held in Charleston, South Carolina, USA on 5-8 May 2005, with more than 160 papers presented.

EPOCH organized a **seminar in Florence** with the collaboration of the Faculty of Architecture, University of Florence on "*Ontologies in Humanities: Archaeology, Architecture and Cultural Heritage*". The seminar took place in Florence on 27 January 2006 with some 30 participants (see below for further details). As a follow-up to this work, Andrea D'Andrea is presenting a paper at the workshop on "Ontology Based Modelling in the Humanities" organised at the University of Hamburg on 7-9 April 2006 (<http://www.c-phil.uni-hamburg.de/view/Main/OntologyWorkshop>).

Follow-up on credibility has taken place at a meeting in January. KCL and PIN (EPOCH partner) organized the **London Symposium and Expert Seminar** "Making 3D Visual Research Outcomes Transparent", which

took place on 23-25 January 2006 at the British Academy and CCH at King's (<http://www.kvl.cch.kcl.ac.uk/Symposium/index.html>).

Some 50 people attended the meeting, with a vibrant discussion on the topic that eventually produced, in the last day experts' seminar, a draft charter for the use of 3-dimensional visualisation in the research and communication of cultural heritage named "The London Charter".

A workshop on standards was held at **EVA Florence** on 4 April 2006 Here discussion on the above issues continued in view of the preparation of a document to be widely circulated.

A one day tutorial on CIDOC-CRM was held at CAA2006 in Fargo, USA.

A preliminary version of the tutorial material on SVG and X3D, conceived to explain the potential of these technological standards to "computer educated" heritage professionals has been produced and is being revised in view of publication on the web site.

Internally, activity on standards has continued with the definition of the survey (to be completed by the end of May), the definition of the documentation procedure for archaeological excavation standards, the activation of an interest group on 3D standards which is managing a Wiki on X3D and Collada, and the completion of the usability survey. The Wiki may be accessed at:

http://partners.epoch-net.org/common_infrastructure/wiki/index.php/Main_Page

Interim achievements were reported at the standards workshop at Eva Florence 2006. A separate communication extensively dealt with the outcomes of the usability survey.

Details on the above are available in D.4.10.

4.2.3 Deviations and corrective actions

There were no major deviations in this Period and minor ones are included in the section on progress and achievements.

4.3 Activity 4.7 Human resource development

4.3.1 Objectives and starting point

Objectives

1. To support the organization by partners of courses, advanced summer schools and other training events
2. To support young researchers' mobility via scholarships
3. To foster inter-partners staff relocation via a mobility support program

Starting point

In year 1 the activity on training and bursaries had mainly focused on introductory courses, aimed at providing basic cross-discipline concepts to young researchers. EPOCH had organized through partners two courses on technology for archaeologists and for museum personnel and a course on the relevant humanities framework for technologists. The latter was completed just at the beginning of year 2. It was then decided to push on the organization of more advanced training opportunities, to be named *EPOCH Summer School* (or *Advanced EPOCH School* when the course period would make reference to Summer inappropriate).

The bursary program had given satisfactory results in year 1. On the contrary, it was perceived that there could have been space for a larger use of the mobility program than had happened in year 1. However, it was likely that progress in the project activity would stimulate staff from partners to be more willing to move – apart from existing administrative limitations that substantially undermine staff relocation, except for the academic personnel – being progressively more involved in joint research activity, apt to motivate visits to collaborating partners.

Finally, dissemination of EPOCH at outstanding scientific and cultural events and exhibitions had been satisfactory in year 1 and it was planned to continue it in year 2.

At the end of 2005 the training and bursary activity showed a satisfactory balance between introductory courses and more advanced ones. However, comments from the interim reviewers suggested a more active commitment towards summer schools and the development of curricula, to obtain a greater and durable impact on the academic. It must be noted that training requires a medium-term planning and it might have been impossible to translate immediately into operations such suggestions. Additionally, the first trimester of the year is traditionally less desirable for non-curricular training, being one of the busiest periods in universities.

Researchers' mobility had not yet reached a satisfactory level but it was expected to start increasing.

4.3.2 Progress and achievements

a) training and bursaries

The following courses/schools were organized in Period 2:

1. **An Introduction for Cultural Heritage Technologists in the Field of Heritage, its Structure and Practice in Europe Today** (Ename Center, Belgium, 13-20 March 2005 - Introductory course). The course offered an introduction and basic background about the structure of heritage institutions and the formulation of heritage policy. Participants have gained familiarity with the major cultural units of the European commission as well as heritage organizations on local, regional, national and international levels. The course aimed at a wide understanding and context for the work of cultural technologists within current European cultural heritage administration and policy. The course intended audience consisted of young graduate researchers.
2. **European Cultural Landscapes: an Interdisciplinary Approach** (CIMEC, Bucharest, Romania, 9-15 May 2005 - Specialization course for professionals). There is a great need and demand from young archaeologists working in museums and/or having responsibilities for the regional sites and monuments record to learn interdisciplinary methods to identify and properly locate sites, to record archaeological landscapes and to present them on-line both for professionals and the public at large. The application of the European Landscape Convention by the Council of Europe, also known as the Florence Charter on the Landscape (http://www.coe.int/t/e/Cultural_Co-operation/Environment/Landscape/) is in fact bringing new challenges for heritage professionals. The course provided training in the use of state-of-art technologies to record, manage and present historic landscapes, according to accepted documentation standards. The course audience consisted of young heritage professionals, already active in museums and sites.

3. **Standards in Recording and Documentation of Archaeological Excavation Data** (PIN, Prato, Italy, 13-18 June 2005 - EPOCH Summer School). A major research problem in archaeology is the lack of standardization concerning methods of excavation and documentation of retrieved data. Moreover, an adequate standard documentation method and data-storing will facilitate a wider dialogue between researchers which will improve the flow of information needed in scientific research. The course has dealt with documentation standards and information retrieval techniques through the participation of highly reputed scholars as teachers and the active participation of students, who were requested to develop the solution of a research problem of their own during seminars. The course participants were prevalently young researchers at PhD or PhD student level.
4. **Use of Space Technologies for the Conservation of Natural and Cultural Heritage.** (Campeche, Mexico, 25-28 November 2005 - EPOCH-UNESCO Joint Course for World Heritage Site Managers). Upon arrangement with the UNESCO Remote Sensing Unit, ESA and INAH, EPOCH has organized a Capacity Building Course for World Heritage Site Managers, particularly aimed at developing countries, sponsoring the participation of 6 top level officers from Central-Eastern European countries. EPOCH partners have provided most of the faculty of the course, which has been followed by an international conference on the same issues. Topics covered different aspects of the use of technologies for heritage management.
5. **International Summer School - Digital Recording and 3D Modelling.** (ETH Zurich, in cooperation with ISPRS Commission VI and Aristotle University of Thessaloniki, Aghios Nikolaos, Crete, 24-29 April 2006). The School brought together young scientists and developers from image-based sciences (photogrammetry, remote sensing, computer vision, dimensional metrology) to study and discuss the latest developments in digital recording and 3D modelling of complex objects and sites, with emphasis on those of cultural heritage value. The teaching consisted of a well-balanced program of lectures and software demonstrations, plus on-site field experience. The quality and experience of both the lecturers and the participants provided an excellent environment for stimulating discussions and high-level information exchange.
Complete reporting for the course is still due, as it is relatively recent and it has overlapped with the preparation year 2 financial and administrative reporting of the project. Preliminary information states that it had a satisfactory development, with about 25 participants from different countries. Indeed, the requests for participation had come from all over the world.

Other training opportunities provided by EPOCH concerned tutorials held at major events as VAST, focusing on standards, which still appear to be a relevant issue for the heritage community.

The distribution of bursaries granted to attend EPOCH courses had the following distribution by country:

Country	BA	BE	CH	FI	GR	HU	IE	IL	IT	NL	PL	RO	RU	SE	SK	UK	YU	Total
Course																		
Ename			1	3	4					1		1				1		11
Cimec								2	1		2			1				6
Pin		2			6		1	2			1	5				3		20
Unesco	1					1					1		1		1		1	6
Total	1	2	1	3	10	1	1	4	2	1	4	6	1	1	1	4	1	43

Notes: Eventually, the nationals from BA (Bosnia and Herzegovina) and RU (Russia) could not attend the UNESCO course for visa problems. The participant from YU was a Montenegro national.

b) curricula

Two initiatives have started on the definition of EPOCH-related curricula.

1. **MBA in Heritage** (three years), proposed by the Business School of the University of Brighton. This prestigious degree would be the first of its kind within an MBA, and discussion on its content is currently ongoing in the academic bodies of the University. Preliminary approval is forecast for

autumn 2006, with a start of the course in the next year. Due to the complexity and length of the approval procedure, it is however possible that the beginning is delayed to the following academic year.

2. **Specialization course in Spatial Databases for Heritage Documentation and Management** (one year), to be activated at the Departamento de Ingeniería Topográfica y Cartografía of the Universidad Politécnica de Madrid, with the collaboration of ETHZ. This course should be at postgraduate level and eventually develop into a PhD. It is still at proposal status, but has been favourably evaluated by the Department bodies. Forecast on activation must take into account that the Spanish procedure may be significantly slower than the UK one.

To stimulate the discussion on innovative curricula, about 1000 copies of EPOCH's Report on Training Offerings and Needs in Europe have been sent to all the heads of relevant departments, faculties and other academic bodies of European Universities, with a letter asking to comment and to report omissions. It is hoped that the controversial tone of the report, which denounces the slowness of many higher education institutions to insert new technologies in their humanities curricula, stimulates reactions and that departments may wish to integrate the information concerning their training offering. Further initiatives on this issue are planned for the next year.

c) Mobility

In 2005, a researcher from Salzburg Research moved to PIN for a period of 3 weeks (4-24 April 2005). In this period, he collaborated to the edition of the first draft of the SOTU report.

No other short term mobility requests were submitted for the Autumn period, perhaps due to the relative uncertainty of the EPOCH situation. As soon as it cleared, several requests were submitted for the next period, reported below.

The mobility of researchers has increased substantially, as expected. The following list summarizes the requests for mobility.

Researchers participating in EPOCH's mobility program 1/01/06 to Summer 2006

Home institution	Guest institution	Length	Period	Completed	PhD student
CNR (IT)	Univ. of Leuven (BE)	3 weeks	January 2006	Yes	No
Ename Center (BE)	PIN (IT)	1 week	April 2006	Yes	No
University of Brighton (UK)	PIN (IT)	1 week	April 2006	Yes	No
Salzburg Research	PIN (IT)	3 weeks	April 2007	Yes	No
Salzburg Research	PIN (IT)	4 weeks	April-May 2006	Yes	No
UPM (ES)	Univ. of Brighton (UK)	12 weeks	May-July 2006	Ongoing	No
Politecnico de Tomar (PT)	PIN (IT)	3 weeks	June-July 2006	No	Yes
University of Kent (UK)	Univ. of Bologna (IT)	3-4 weeks	June-July 2006	No	Yes
University of Bologna (IT)	University of Kent (UK)	3-4 weeks	Autumn 2006	No	Yes
<i>Tecnologico de Monterrey (MX)</i>	<i>various partners</i>	<i>3-4 weeks</i>	<i>July 2006</i>	<i>No</i>	<i>No</i>
<i>University of Sydney (AU)</i>	<i>various partners</i>	<i>3-4 weeks</i>	<i>Autumn 2006</i>	<i>Under examination</i>	<i>possibly yes</i>

Note: the last two lines concern requests to establish agreements to establish exchanges of PhD students and faculty with two institutions outside Europe, currently under consideration.

From the above summary, it appears that mobility has started to attract EPOCH researchers, equally distributed between PhD students and senior researchers, although non-academic partners may host PhD students but obviously have none of their own; that it is based on actual joint research, or particular expertise of a partner (this explains the case of PIN, with most visitors interested in the activity on standards); that the preferred length is about one month, or very short stays. It is clear that relocation is still very difficult because of the administrative and legislative barriers but short mobility may greatly improve the partnership's integration.

c) Events

Events managed/organized/attended by EPOCH in Period 2 include the following.

1. **EVA 2005 Florence** (Firenze, Italy, 14-18 March 2005). EPOCH presented a report on the current activity of the project, and participated in networking sessions with Russian researchers attending the Conference to explore possible collaborations.
<http://lci.det.unifi.it/Events/Eva2005/eva2005.htm>
2. **CAA2005** (Tomar, Portugal, 21-24 March 2005). At CAA 2005, EPOCH organized a session (so-called "I9action session") to provide extensive information about its activity and interim results. A workshop on standards and a tutorial on CIDOC-CRM were also organized, see above. In a parallel exhibition, the project's showcases were demonstrated to conference delegates. As usual, the network organized here its BoD meeting and the General Assembly of its partners.
<http://www.caa2005.ipt.pt/>
3. **Museums and Heritage Show London 2005** (London, 11-12 May 2005). This is an exhibition usually visited by heritage professionals and managers, mainly from UK but also with an international attendance. EPOCH has participated with its stand, demonstrating its results and distributing promotional material. A number of contacts with interested visitors has been established.
<http://www.museumsandheritage.com/>
4. **Heritage Impact 2005** (Brighton, UK, 7-8 July 2005). This Symposium is unique in its genre and is organized by EPOCH and the University of Brighton. It deals with the analysis and evaluation of the socio-economic impact in the cultural heritage sector. The success of the first edition has suggested to replicate it in 2006.
<http://www.cmis.brighton.ac.uk/staff/epoch/index2005.php>
5. **EAA2005** (Cork, Ireland, 5-11 September 2005). The EAA annual conference gathers archaeologists from all around Europe. It is managed by EAA, the European Association of Archaeologists, a Europe-wide professional association that has been acknowledged as representative of the category also by the EC (a delegate from EAA has been invited to join the FP7 Social Science and Humanities consultative committee). EPOCH has managed a booth distributing various illustrative material.
<http://eaacork.ucc.ie/>
6. **UBICOMP05** (Tokio, Japan, 11-14 September 2005). EPOCH has organized a workshop on "Smart Environments and their Application to Cultural Heritage" with 11 papers on heritage applications of mobile computing.
<http://www.ubicomp.org/ubicomp2005/>
7. **ICHIM05** (Paris, France, 21-23 September 2005) EPOCH made a presentation of its activity and results.
<http://ichim05.ichim.org/jahia/Jahia/>
8. **VSM2005** (Ghent, Belgium, 3-7 October 2005) EPOCH has organized here two workshop on the "Effective Implementation of Technology in the CH Domain", and the "Role of SMEs in Cultural Heritage".
<http://belgium.vsmm.org/pages/program.html>
9. **VAST2005** (Pisa, Italy, 9-11 November 2005) The Annual International Symposium on Virtual Reality, Archaeology and Cultural Heritage has now reached its 6th edition, starting in 2000 in Arezzo, Italy and has become an appointment for the researchers of graphics and cultural heritage domain. It was preceded by four EPOCH workshops on 8 November: on Standards, on Research Trends and EPOCH's Common Infrastructure, on Socio-Economic Impact and on SME Encouragement. EPOCH bodies (EXC, BoD, General Assembly) met during VAST.
<http://vcg.isti.cnr.it/vast05/index.php>.

10. **Communicating European Research 2005** (Bruxelles, 14-15 November 2005) Organized by the European Commission's Directorate-General for Research, the International Conference and Exhibition was attended by EPOCH with a booth where dissemination material was distributed and demonstrations were held about its achievements.
http://ec.europa.eu/research/conferences/2005/cer2005/index_en.html
11. **UNESCO Conference "Use of Space Technologies for the Conservation of Natural and Cultural Heritage"** (Campeche, Mexico, 28 November – 2 December 2005). Jointly organized by UNESCO, ESA and Eurisy, in cooperation with INAH (Mexican Instituto Nacional de Antropología e Historia) with the support of EPOCH and other institutions. EPOCH presented the goals and results of the project to an international audience with a significant presence of Latin American researchers and heritage professionals. See the detailed program at
<http://www.eurisy.org/SITE/upload/PDFa/546FinalAnnouncement.pdf>.
12. **EVA Jerusalem** (Jerusalem, Israel, 29-30 November 2005) Organized by the Minerva Network in Israel. EPOCH participated organizing a session jointly with the partner IAA (Israel Antiquity Authority, the State agency for antiquities) on "Emerging technologies for Research and Dissemination of Cultural Heritage".
<http://www.minervaisrael.org.il/evaminerva.html>
13. **Heritage Presentation and Preservation – A Digital Perspective** (Hull, UK, 7 December 2005). A one-day workshop with a training/dissemination perspective, organized by the partner university of Hull with the support of EPOCH and other partners. For details of the program:
http://www.dcs.hull.ac.uk/simvis/research/simvis_archaeology/workshop/review.htm
14. **Information Technology and Heritage: EPOCH's solutions. A capacity building workshop for heritage professionals in Central Europe** (Cracow, Poland, 19-21 January 2006). The workshop has been the first of a series, planned to advertise EPOCH's activity at a regional level. It has been organized in co-operation with ICC, the International Culture Center in Cracow (<http://www.mck.krakow.pl/index.php?lang=eng>), a very active State-funded Polish organization, and AHICE, a network of heritage professionals from Central European Countries. Presentations have included all aspects of EPOCH's work and have been followed by seminar discussion with participants. It was attended by some 30 people equally distributed among Poland, Slovakia, the Czech Republic, and Hungary. <http://www.mck.krakow.pl/view.php?id=4&idm=26>
15. **Ontologies in Humanities: Archaeology, Architecture and Cultural Heritage** (Florence, 27 January 2006) A seminar organized with the collaboration of the Faculty of Architecture, University of Florence with some 30 participants from several Italian Universities. A team from the CNR Laboratory for Applied Ontology (Nicola Guarino, Aldo Gangemi and Stefano Borgo) were invited speakers, together with Andrea D'Andrea (CISA, EPOCH partner) lecturing on *Ontologies for Cultural Heritage* and Chiara Cirinnà (Faculty of Architecture, University of Florence) lecturing on case studies in Architectural studies. Some 10 contributions were collected in response to a call for papers, concerning diverse fields of applications. Papers will be published in a proceedings volume. The main goal of the seminar was to reach researchers and professionals possibly interested in standards but not directly involved in them; to coordinate efforts at a national Italian level; to disseminate EPOCH's activity beyond the partnership
16. **Making 3D Visual Research Outcomes Transparent** (London, UK, 23-25 February 2006). An Invitation Symposium and Expert Seminar promoted by The British Academy, London and The Centre for Computing in the Humanities at King's College London and organized by The AHRC Methods Network and PIN. The symposium was attended by about 50 people with 10 lectures, it included an expert seminar that eventually produced a draft of a charter about the credibility of 3D reconstructions (see the report on standards D.4.10 for further details).
<http://www.kvl.cch.kcl.ac.uk/Symposium/index.html>

17. **EVA Florence 2006** (Florence, Italy, 3-7 April 2006). At EVA Florence, EPOCH has organized workshops on the first day on Standards, the Research Agenda and the Common Infrastructure, attended, in the average, by some 50 people each. A presentation was given in the plenary.
<http://lci.die.unifi.it/Events/Eva2006/eva2006.htm>
18. **CAA2006** (Fargo, ND, USA, 18-23 April 2006). EPOCH followed the CAA overseas organizing an active presence, consisting of a presentation panel session, attended by some 30 people and followed by a discussion and a number of positive contacts; a booth with printed material and live demos; and a tutorial on CIDOC-CRM. The very successful mission in USA proved the opportunity of extending the presentation events outside Europe.
<http://www.caa2006.org/>

Summary of event attendance & organization
1 January 2006 – 30 April 2006

Event	Venue	Country	Event type	Domain	Audience	Scope	Contacts	EPOCH's role
EVA 2005 Florence	Firenze	IT	Scientific Conference	Interdisciplinary	Researchers	Europe	50	Presentation
CAA2005	Tomar	PT	Scientific Conference	Interdisciplinary	Researchers	70% Europe, 30% overseas	250	Session, workshops & stand
Museums and Heritage 2005	London	UK	Exhibition	Museums	Professional	90% UK, 10% Europe and overseas	1300	Stand
Heritage Impact 2005	Brighton	UK	Scientific Conference	Economics	Researchers	Europe	90	Organizer
EAA2005	Cork	IE	Scientific Conference	Archaeology	Researchers, professionals	Europe	700	Stand
UBICOMP05	Tokio	JP	Scientific Conference	Technology	Researchers	Worldwide	50	Workshop
ICHIM05	Paris	FR	Scientific Conference	Museums	Researchers, professionals	Europe	60	Presentation
VSM2005	Ghent	BE	Scientific Conference	Technology	Researchers	Worldwide	50	Workshops
VAST2005	Pisa	IT	Scientific Conference	Interdisciplinary	Researchers	80% Europe, 20% overseas	150	Organizer
CER2005	Bruxelles	BE	Policy Conference	Policies of research	Policy makers, media, research managers	Europe	2100	Stand
UNESCO Conference	Campeche	MX	Scientific Conference	Heritage and natural sites	Site managers	Latin America, developing countries	150	Presentation
EVA Jerusalem	Jerusalem	IL	Scientific Conference	Interdisciplinary	Policy makers, researchers	Israel	100	Session
HULL	Hull	UK	Workshop	Humanities	Researchers	UK	40	Organizer
ICC Cracow	Cracow	PL	Capacity building workshop	Heritage, museums	Professionals	Poland, Czech Rep, Slovakia, Hungary	30	Organizer
Ontologies seminar	Firenze	IT	Scientific Conference	Interdisciplinary	Researchers	Italy	30	Organizer
King's Symposium	London	UK	Scientific Conference	Interdisciplinary	Researchers	UK 60%, Europe 40%	60	Organizer
EVA 2006 Florence	Firenze	IT	Scientific Conference	Interdisciplinary	Researchers	Italy	100	Workshops + presentation
CAA2006	Fargo	UK	Scientific Conference	Interdisciplinary	Researchers	50% USA, 50% Europe	250	Session, workshops & stand

Note: the number of contacts refers to those attending the EPOCH workshops/session. When EPOCH managed a stand, the number refers to all the event participants.

4.3.3 Deviations and corrective actions

There were no major deviations in this Period and minor ones are included in the section on progress and achievements.

4.4 Activity 4.8 Publications

4.4.1 Objectives and starting point

Objectives

To guarantee the dissemination of EPOCH's achievements and results.

Starting point

EPOCH's publications started in year 1 and have continued regularly. The delay in the payment of the EU contribution has adversely affected the publication activity: since typesetting and printing requires payment in cash, publication plans have been delayed whenever possible (i.e. delays have not concerned conference proceedings).

4.4.2 Progress and achievements

Publications in the relevant period include:

1. *Smart Environments and their Applications to Cultural Heritage*, edited by Nick Ryan, Tullio Salmon Cinotti and Giuseppe Raffa Proceedings of the workshop held at UbiComp05. Archaeolingua, Budapest, 2005.
2. *VAST2005 – Proceedings of the Conference* edited by Mark Mudge, Nick Ryan and Roberto Scopigno, Eurographics, Aire-la-Ville, 2005 (in co-operation with ACM SIGGRAPH and Eurographics).
3. *VAST2005 – Short & Project Papers Proceedings* edited by Mark Mudge, Nick Ryan and Roberto Scopigno, Pisa, 2005 (in co-operation with ISTI-CNR)
4. *Heritage Impact 2005*, edited by Jim McLoughlin, Jamie Kaminski and Babar Sodagar. Proceedings of the first international symposium on the socio-economic impact of cultural heritage, Archaeolingua, Budapest, 2006.

Additionally, leaflets and other dissemination material has been produced for events.

Other media

On 22 December 2005, Prof. Niccolucci of PIN gave a 30' interview on an Italian satellite TV on EPOCH in the framework of a science series titled "The four elements". The interview was broadcast on 19 January 2006.

4.4.3 Deviations and corrective actions

There were no major deviations in this Period and minor ones are included in the section on progress and achievements.

Section 3 – Consortium Management

1.1 Objectives of Management Workpackage (from section 9.6.1 of JPA2):

The general objectives of this activity are described in Annex I. Specific objectives for JPA2 are:

Activity 1: Policy and Procedures. During JPA2 this activity will continue to seek feedback, on the EPOCH Policy and Procedures Manual for running the Joint Program of Activities over the period of the contract. In addition the activity will monitor implementation of the JPA and seek to detect improvements to the Manual that would assist in the delivery of the NoE's objectives.

Activity 2: Network management: planning and monitoring. Under this activity the network management will monitor the delivery of the JPA, including deliverable production scheduling (QA will be handled under Activity 1.4), realisation of milestones, monitoring the implementation of the policy and procedures to prepare updated JPAs. This task includes (a) establishing the operational aspects of the Board of Directors, the Management Executive Committee and the servicing of AGMs, (b) Ensuring smooth transition from JPA18 to JPA2 and further preparation for JPA3, (c) preparing documentation for the 1st Commission review meeting (d) Preparing 6-monthly Interim or Periodic Activity Reports as appropriate (e) Monitoring the management reports from the WPs and Activities in order to anticipate difficulties and resolve issue of governance (f) production of on-line tools to assist in the monitoring of activities and the production of management reports.

During JPA2 there will be three general meetings, preceded by meetings of the Board of Directors and interspersed with meetings of the Executive and WP management groups.

Activity 3: Financial Control and Budget Planning. Under this activity the NoE management and Finance Sub-committee will monitor spend against budget, implement internal audit, advise and monitor on budgeting for individual activities (e.g. Event plans, bursary commitments, additional components of the jointly executed research program) and integrate the results into consolidated reporting for the Executive, Board of Directors, AGM and Commission reviews. In addition the Finance Sub-Committee will oversee the application of the "Unallocated" funds to Scalable activities and propose application of contingency funds.

Tailored budgeting tools have been developed for managing the allocations to partners and assisting in the production of contract documentation. These tools have been used in the budgeting of activities for JPA2 and it is intended to extend the suite of tools to support on line financial and effort reporting and monitoring via a secure area of the website.

Activity 4: Monitoring and Evaluation

Two sub-areas of this activity were originally envisaged – (1) the nomination, maintenance and support of the Review College and Applications' Task Force memberships and (2) implementation of the policies on internal review of deliverables and progress.

In the first 12 months the Review College was established and the independent members were used extensively in the consultation process on the proposals for NEWTONs under WP3. However the process of getting responses firstly from partners in the nomination process and secondly from the nominated members of the Review College, coupled with the slower than planned start to many of the activities meant that the full implementation of the review of deliverables before submission had yet to be consistently implemented. A good deal of the internal review has had to be undertaken by members of the review college who are also employed by partners and the timescales allowed for review have been, at times, extremely tight. The description of JPA18 had made it an objective that the QA processes would become fully established by month 18 and this remains realistic. To accomplish this, the NoE will implement review through the MCP system developed and run by Partner 19 (TU-Braunschweig). This system is robust and secure and will be tailored to allow its use for independent review of, and feedback on, deliverables by members of the review college.

Another objective of JPA2 was to fully implement the intention of explicitly monitoring the NoE's attention to applications' concerns by extending the notion of constituency of the review college members to differentiate applications interests. This would allow a unified monitoring process rather than the original concept of orthogonal processes which had proved impossible to implement in the first 12 months and, with the hindsight of experience, would always be more cumbersome at best and inoperable at worst. This development is in line with the review envisaged in the JPA18 contract ("During the last 6-months of JPA18 the quality assurance process itself will be reviewed and adjustments made as necessary including possibly to the membership of the Review College and Applications' Task Force").

During JPA18 revised guidelines on the reporting for NoEs had been received from the Commission and this guidance was used as a basis for rationalising and superseding the original range of measures of integration. To monitor these measures it will be necessary to implement a revised set of performance measures and to collect statistics systematically to assess these. The actual data collection was to be coordinated through activity 1.4 with collection undertaken under the activity to which the data relates, but with guidance and monitoring from Activity 1.4. The data collection schema is documented in the section 7.2 of JPA2. The planned data collection was planned as the operational component to evidence the high-level integration measures being negotiated as part of reacting to Commission advice on appropriate integration measures for NoEs.

The extended review process and delays in approval for JPA2 and the Cost Claim for Period 1 have had a significant impact on the progress made towards the objectives listed above. In particular, sustaining the initial coherent and collaborative relationships which had begun in Period 1 has taken a substantial effort from the Coordinator and Workpackage Leaders which at times has been a challenge to balance with the day-to-day running of the Joint Programme of Activities.

- The Administrative Team have supported the operations of the Executive Committee and Board of Directors. The Executive has met approximately every month (either in-person or by recorded conference call) and the Board has met three times in the Period (and once in month 13). This has involved liaison with the organisers of a number of international events (CAA05, VAST05, EVA Florence 06).
- Once the breakdown explanations of the payment received for the Period 1 Cost Claim and JPA2 pre-financing were available, payments were dispatched swiftly, with an average time to action payment of around one week.
- All deliverables have been processed within the allowed time frames, with the exception of those for which alternative arrangements had to be made to accommodate the transition of the Workpackage 2 Leader from a core partner organisation to an organisation outside the Network. In addition, agreement was reached with the Project Officer to prioritise other matters over delivery of the Interim Activity Report following the Annual Review meeting in November.
- The lessons learnt from the Period 1 Cost Claim have been used in preparation of a guide for the Period 2 Cost Claim. This has proved invaluable as a substantial number of partners are new to the process for this Period and yet delivery of information has been timely and efficient. A full report of the status of the financial claim is included in the Periodic Management Report.
- Once the formal approval of JPA2 had been received the Executive instigated a full review of the status of each workpackage as documented elsewhere in this report. The process was designed as a critical review in order to check systematically that all areas were considered for prioritisation in the remainder of period 2.
- Deliverables under WP3 and WP4 were reviewed by members of the review college who were independent of the work and revised in response to comments. Those for WP2 became delayed due to a combination of new arrangements and subsequent serious personal pressures for both the WP2 coordinator and the newly appointed deputy, which arose before the new structures were fully implemented. These delays were managed by a combination of guidance and inputs from the WP leader and additional efforts by the coordinator's EPOCH support team. At the same attention was paid to learning from this situation about management of risk within the project and the executive is giving active consideration to the potential for an effective revised structure and/or processes which will be used to minimise these risks.
- Voting and comment mechanisms have been used again on-line through the website for consultations on potential accession of new partners.

- As JPA2 approval and related payments arrived relatively close to the Period end, WP1 instigated internal review meetings as below, with two members of the Executive Committee reviewing the status of each Workpackage.

Workpackage	1	2	3	4
Date of Internal Review	20 February 2006	2 March 2006	3 March 2006	3 March 2006
Executive Committee member reviewers	Franco Niccolucci, WP4 Leader Daniel Pletinckx, WP2 Leader	Franco Niccolucci, WP4 Leader Halina Gottlieb, WP2 Deputy	David Arnold, WP1 Leader Paolo Cignoni, WP3 Deputy	Luc Van Gool, WP3 Leader Nick Ryan, WP4 Deputy
In attendance	Hilary Williams, Project Administrator	John Clinton, Project Manager	John Clinton, Project Manager	John Clinton, Project Manager
Consortium members present	David Arnold, WP1 Leader John Clinton, Project Manager	Malika Hamza, Activity 2.1 Leader, Despina Kannellou, Activity 2.8 Leader Daniel Pletinckx, Activity 2.5 Leader Neil Silberman, Ename Center Jim McLoughlin, Activity 2.6 Leader	Luc Van Gool, WP3 Leader Luc Van Eycken, WP3 Deputy	Franco Niccolucci, WP4 Leader

The following general agenda items were discussed at these meetings:

- Annual Review feedback on directions
- Financial and effort resources
- Threats
- Revised Deliverables List from JPA2
- Contributions to Risk Register
- Measures of Integration

By the end of the first period the initial slow start to the project meant that a substantial portion of the original JPA18 had started somewhat later than envisaged and this was reflected in a relatively large carry forward of pre-financing targeted at JPA18. This was reported last year and it was envisaged that the effects of the late start would be made up by the end of JPA18. To a large extent this appears to have been born out by the returns. However, the additional delays meant that the pre-financing allocated to partners was exhausted before the official permission to proceed with JPA2 was received. The analysis of the management returns from partners supports the instinctive conclusion that the administrative delays in processing the period 1 returns led to a slowing down of commitment after the back log of year 1 was completed. There has then been a need to re-energise the activities once the official go ahead for JPA2 was received. This has meant that the apparent situation of being on track for “in period” expenditure, in effect disguises a carry forward almost equivalent to that at the end of the first period and consequent need to “catch up”.

Some areas of significant concern/deviation where JPA2 had sought to learn from the experience in JPA18 are:

- a. The need to broaden the basis of the Executive Committee so that the load and risk is spread. The new Executive membership is proposed to involve 7 people. (Section 8.2 of JPA2)
- b. It is proposed to implement the Application Task Forces as a constituency within the Review College. Having an orthogonal independent mechanism has led to a great deal of concern as to how several parallel mechanisms would be synchronised (Review College, Applications’ Task Forces, Partnership consultations, Board of Directors consultations) and how the results of such consultations would be brought together to give coherent guidance on future directions. The

proposals will make the consultation/guidance operations much cleaner to implement. (Section 8.4.1 of JPA2)

- c. It is proposed to bring together the coordination and direction of data collection for monitoring integration progress, out of the individual Activities and into Activity 1.4. (Section 7.2 of JPA2).
- d. It is proposed to introduce the formal concept of the Affiliated Participant to spread the potential involvement (particularly of SMEs and other applications-orientated organisations) (section 8.11 of JPA2 – see Appendix 4)

The expansion of the Executive Committee to 7 members has been implemented, with the addition of Halina Gottlieb (The Interactive Institute); Paolo Cignoni (CNR, Pisa) and Nick Ryan (University of Kent) to act as deputies in the work package leadership of WP2, 3 and 4 respectively. Further expansion of the Executive Committee and the Board of Directors is planned by elected posts of representatives from partner contacts (EXC), and researchers and research students active in the project (2 places on the Board of Directors). These plans require that the “electoral colleges” for the new positions (the list of active researchers involved in the project) required updating. This process has been initiated but was not complete before the needs for end of Period reporting had to be prioritised. The elections are now expected in the first half of period 3.

Similar considerations of the needs to allow partners to respond to communications and the need to prioritise these requests for information have led to postponement of the extension of the review college to the first half of period 3.

The systematic collection of data for statistics on the various activities has been reinforced as these activities are initiated, so for example the new regional meetings are made aware of the need to collect statistics and feedback from participants, and those running course with (partial) support from EPOCH are made aware of the requirement to provide a report and feedback on the experience. At present this reporting is then monitored and assessed via the individual workpackage leadership, but the more systematic semi-independent evaluation through Activity 1.4 has yet to permeate through all the relevant activities.

The “list of potential subcontractors” listed in JPA18, who were in fact signed up as associate partners at the proposal stage, have been invited to become Affiliate Participants. There is also on-going expansion of this group with the addition of interested parties drawn in part from those wishing to become involved in the EPOCH Network of Expertise Centres (NoEC). The formal status, benefits and relationship to the consortium agreement are being developed, with consideration of the approaches taken to these issues in other projects with similar status. In particular, the PASCAL project has well developed documentation of a similar class of membership and the formal agreement under which such participants agree to act.

4.2 Contractors

The following new contractors have been formally voted on by the EPOCH Assembly and will form part of an amendment request with the revision of the JPA:

Regency Town House

Socio-economic impact analysis contribution

There are a number of ways that having a committed local partner could enhance the results from the socio economic impact research section of EPOCH:

1. Socio impact analysis requires an immense commitment from CH sites in their willingness to supply data. We are seeking two or three case studies initially and besides the agreement of ENAME we have yet to secure a second case study for research. Regency Town Houses would provide an interesting, if somewhat difficult, case study.
2. As we are testing methodologies, having a motivated local partner would be efficient way to carry out the research.
3. Regency Town House form of heritage is quite different to the ENAME case study, giving a chance to test methodologies in different contexts.
4. Since local access is so economical to test methodologies it would be desirable to compare and contrast Regency town houses with the Pavilion Palace/Brighton Museum. While the former is not

- particularly a destination form of tourism (and therefore impact is more difficult to capture) the Pavilion Palace lends itself more easily to conventional impact analysis.
5. As Brighton University is a key partner in the EPOCH project it would be good to have at least one favourable local impact benefit for the city itself.

Technical Contribution

Regency Town House trust has extended experience in distribution of freeware multimedia authoring tools. In particular, the Conveyor system, which provides museum and gallery staff with a simple to use multimedia authoring template, is their most successful project to date.

This initiative is proving so popular that in less than three years, it has gone from being a UK only product to one with an extensive worldwide user base including Europe, Asia and America.

Training and Consultancy

Regency Town House trust offers a series of workshops each year specifically geared to enabling surveyors and similar professionals to learn more about traditional building skills.

University of Southampton

The University of Southampton has a department, specialised in geophysics, with very specific know how in ground resistivity and magnetometer. They are both an academic group and operational team that have very extensive field experience on all kinds of archaeological sites all over Europe. Through the in-depth knowledge of the physics behind these techniques, combined with a sound and wide archaeological knowledge, this group produces very good interpretations of archaeological features. This group will certainly bring knowledge into EPOCH that is currently lacking, and that is becoming more and more a key technique within the archaeological investigation. There is a proposal to make this knowledge available to the EPOCH community through an extended course, where other partners will provide know how on linking virtual reconstructions and database storage to these techniques.

Salzburg Research Forschungsgesellschaft

Salzburg Research Forschungsgesellschaft is the non-profit research organisation of the State of Salzburg. It conducts applied research in the areas of information and communication technologies with a focus on creating and managing digital content.

They presently employ 55 researchers across their application areas of Digital Media, eCulture, eTourism and IT-enhanced Learning.

Salzburg Research offers a combination of strategic and practical solutions in technology and social development. A mix of lead international projects, national competence centres, Pan European pilot studies and local consulting contracts, provides a dynamic flow of innovation and knowledge between regional, national and international clients and partners. Their clients and partners include private companies, national and international technology leaders and public bodies such as governments, public administration, libraries and other educational and social institutions.

Salzburg Research

<http://www.salzburgresearch.at/company/index.php>

Rijksdienst voor het Oudheidkundig bodemonderzoek (Dutch National Service for Archaeological Heritage - ROB)

Being the national service for archaeological heritage, the objective of the Rijksdienst voor het Oudheidkundig bodemonderzoek (ROB) is to keep the past alive. The ROB wants to keep the cultural lines from their past present and tangible, now and in the future; archaeological traces in the soil should, where possible, be preserved for future generations.

One of the main tasks of the ROB is to execute and maintain the Monumentenwet (the Cultural Monuments Act). This means that via this act the ROB may protect areas of a very high archaeological value. Furthermore, the ROB inspects these monuments and is now formulating a policy of maintenance.

Preventatively, the ROB works on preservation and administration of archaeological monuments, both on dry land and under water. They also try to fit these monuments into existing and new land-development plans. Given the (growing) scarcity and constant threats to archaeological heritage, care for this heritage should be the responsibility of national, provincial and local governments.

Due to the development of ideas about archaeological heritage, both within as well as outside the profession, the ROB sees for itself a role as governing body and knowledge-centre.

Rijksdienst voor het Oudheidkundig bodemonderzoek (Dutch National Service for Archaeological Heritage - ROB)

<http://www.archis.nl/>

The Israel Antiquities Authority (IAA)

The Israel Antiquities Authority is currently listed in the contract as an Affiliated Organisation.

As such, the IAA has had the opportunity to learn about EPOCH's work, become acquainted with its goals and had various collaboration opportunities with EPOCH partners.

They have also learned about the projects run by partners throughout Europe and introduce some of the work for which they are responsible – specifically in the internet and the virtual simulation fields.

IAA propose to become a full partner within EPOCH, and thus share information and data with other EPOCH partners, learn from them, contribute acquired information about Cultural Heritage applications developed within the IAA, be a part in (ongoing) projects and propose new projects.

From prehistoric eras until modern times, the Land of Israel has been a focal point for historic events that affected mankind. Nations rose and fell in this region, which was the cradle of monotheistic religions. The cultural wealth of the land is shared by millions of people throughout the world – Jews, Christians, and Muslims alike, as well as all culture-loving people.

Hence, it is the role and responsibility of the Antiquities Authority to safeguard the antiquities, excavate them when necessary and publish the results.

The workers and administrators of the Antiquities Authority, consider the protection of the country's antiquities a mission of the highest calling, and act to achieve this aim by properly balancing the country's development needs with the safeguarding of its antiquities.

The Israel Antiquities Authority is the leading and dominant institution in Israel developing archaeological applications while combining them with the actual archaeological field works. Those applications were developed in order to assist and promote the field studies, the research held in the different laboratories, the publication processes, provide digital solutions for all the accumulated data and enable to retrieve the scientific data of the millions of artifacts which are kept in the National Treasures managed by the IAA, by means of advanced search engines.

The Conservation Department of the Antiquities Authority determines the conservation policy in general, and the conservation in ancient cities in particular. It aims to preserve the remains of the architectural cultural heritage of our country. The Conservation Department continues its involvement in the development of large antiquity sites, for example Jerusalem, Bet She'an and Caesarea. The Antiquities Authority likewise invests considerable effort in developing and conserving buildings in historic cities, such as Zefat, Shefar'am, Ramla, Tiberias, Be'er Sheva' and Jaffa.

More details about the Israel Antiquities Authority on our website:

Visual Dimension

Visual Dimension bvba is a multi-professional architectural company, that active both in architecture and cultural heritage consulting. Multi-professional architectural companies are a legal form of company, approved by the Belgian Architectural Council, to allow architectural activities to be combined with other related activities. Both domains are well connected as the use of technology in a cultural heritage context is frequently linked to architectural issues such as restoration, integration of technology in monuments, design of visitor facilities and so forth. The company was founded in 2003 by Daniel Pletinckx and architect Veerle Delange.

The company employs 4 people full-time and one person part-time. Cultural heritage activities focus on consultation and realisation of projects where ICT is used in an innovative way. Examples of this include concepts for new museums, master plans for heritage presentations of landscapes or cities, systems for public presentation at archaeological sites and the integration of ICT in tourism. The company is active internationally within Europe, and draws on Daniel Pletinckx's 8 years of experience in the cultural heritage domain as an independent consultant.

Visual Dimension proposes to contribute to EPOCH by taking responsibility for the following activities (responsibility for which has been returned by the Ename Center to the EPOCH Consortium):

- 2.5 – Research Agenda
- 2.7 – Brokerage
- 2.8 – Encouragement of SME Participation
- 3.3 – Common Infrastructure
- 4.7 – Human Resource Development

King's College, London

The team of ICT researchers at the University of Warwick (EPOCH Partner 59), led by Prof. Richard Beacham has moved and is now constituted as the King's Visualisation Lab at the Centre of Computing in the Humanities, King's College, London.

This team has in the course of its almost ten year history, achieved important results in such areas as virtual and 3D based reconstructions of cultural heritage artefacts; archaeological investigations aided by computer-based methodologies; the preparation and presentation of extensive data sets relating to such artefacts and their history; the development of methodologies to ensure the reliability and transparency of results; the design and implementation of dedicated websites enabling extensive exploration of our research outcomes. The team also has very extensive public lecture and conference presentations experience and experience in the obtainment and pursuit of numerous publicly sponsored research projects, with support from such organisation as the Getty Trust, the Arts and Humanities Research Council, the Leverhulme Trust, Kew Gardens, the Colchester Archaeological Trust, and of course the European Community.

CINECA

CINECA is the Interuniversity Consortium of Northeastern Italy for Automatic Computing, made up of 25 Italian universities. The ViSiT Lab at CINECA, has achieved important results in the development of virtual interactive environments for Cultural Scenarios.

The Lab for Landscape and Cultural Heritage Management and Communication aim:

- To create portable and scaleable real time applications based on high resolution 3D computer models linked to multimedia contents organized in databases and numerical simulations in order to navigate, explore and inquire effectively into landscape and cultural scenarios avoiding the risk of transmitting superficial or misleading scientific/historical information.

- To train PhD students, architects, archaeologists, historians, city planners, cultural operators and others in following an interdisciplinary methodology of creating Augmented and Virtual Environments products.

The ViSiT Lab at CINECA proposes to contribute to EPOCH in the following areas:

- Architectural and terrain modelling for virtual environments
- VISMAN Virtual Scenarios Manager – a tool for Dynamic management of virtual environment
- Multimodal interface programming
- Web based terrain visualization
- Grid and Web based services infrastructure
- Data repositories services

C2RMF

The Department of Documentation and Information Technologies at the Centre for Research and Restoration of the Museums in France (C2RMF) has achieved important results in high quality digitisation since 1989 and more recently multispectral imaging of paintings and 3D modelling of objects and paintings.

Furthermore it has achieved significant results with an Open Source database management system with a multilingual and an ontology access containing specialised vocabularies for the Cultural museum sector.

C2RMF proposes to contribute to EPOCH in the following areas:

- **3D models production**

The C2RMF is engaged in a national project of 3D model content recognition. The production of 3D models with the University of Leuven can help this research.

- **Multilingual access to EROS**

EPOCH could collaborate on the translation of some dictionaries of the EROS database for a few missing European languages, for example through its partner HEREIN. If possible, EROS could be on the Internet for Cultural Access.

EPOCH partners could give their existing lists of geo-coordinates of the towns and if possible of some archaeological sites in their country for cartography representation of data.

- **Standardisation**

The C2RMF could give access to the mapping developed for museum and library database based on the CIDOC-CRM.

F.O.R.T.H.

The Laboratory of Geophysical – Satellite Remote Sensing & Archaeo-environment at the Institute for Mediterranean Studies / Foundation for Research & Technology, Hellas (F.O.R.T.H.), Crete, has achieved important results in the areas of Geophysical Prospection, Satellite Remote Sensing and GIS.

Since 1996, the Laboratory of Geophysical - Satellite Remote Sensing & Archaeoenvironment of the Institute for Mediterranean Studies (I.M.S.) / Foundation of Research & Technology (F.O.R.T.H.) has provided valuable services in the areas of geophysical prospection, satellite remote sensing, Geographical Information

Systems (GIS) and archaeo-environment and has been widely recognised due to the quality of the services provided, the results of the research projects carried out and the training of students and professional archaeologists.

The Laboratory has carried out a large number of geophysical prospection projects in archaeological sites aiming at the mapping of the subsurface relics and the support of excavations. Both ground and satellite remote sensing techniques contribute to the mapping of the subsurface monuments, the management and protection of archaeological sites and the better exploitation of the natural and cultural environment

The Laboratory employs the most modern techniques for accurate field measurements and has a technical support (hardware and software) that meets the needs of processing, analysing and mapping geophysical and satellite data.

FORTH proposes to contribute to EPOCH in the following areas:

- Geophysical Prospection
- Satellite Remote Sensing
- Geographical Information Systems (GIS)
- Archaeo-environment (lithics, fish-bones, etc).

4.3 Periodic report on the distribution of the Community's contribution

An amount of € 1,531,479.39 in payment of Cost Claim for Period 1 and pre-financing for JPA2 was received by the Coordinator on 29 December 2005. The breakdown explanation of this amount was received on 16 January 2006. It then became apparent that a number of supplementary documents to the Cost Claim for Period 1 submitted by the Coordinator had not been taken into account.

The table below gives a breakdown of the distribution of the payment to the Consortium. Any remaining amount relates to either pre-financing of unallocated funds.

Payment date	Description	No.	Partner	€
01-Feb-06	Cost Claim and Pre-financing JPA2	56	UEA	58,865
03-Feb-06	Cost Claim and Pre-financing JPA2	4	KU Leuven	75,939
03-Feb-06	Pre-financing JPA2 only	7	UIBK	6,800
03-Feb-06	Pre-financing JPA2 only	10	VARTEC	5,100
03-Feb-06	Cost Claim and Pre-financing JPA2	20	FHG-IGD	25,150
03-Feb-06	Cost Claim and Pre-financing JPA2	29	POLIMI	29,842
03-Feb-06	Cost Claim and Pre-financing JPA2	39	UIO	2,762
03-Feb-06	Cost Claim and Pre-financing JPA2	48	ETH	18,559
03-Feb-06	Cost Claim and Pre-financing JPA2	49	UNIGE	38,333
03-Feb-06	Cost Claim and Pre-financing JPA2	50	EPFL	55,000
03-Feb-06	Cost Claim and Pre-financing JPA2	52	UNIKENT	31,049
03-Feb-06	Cost Claim and Pre-financing JPA2	61	PPL	10,088
03-Feb-06	Pre-financing JPA2 only	67	OAD	5,950
03-Feb-06	Cost Claim and Pre-financing JPA2	68	IBC	9,400
03-Feb-06	Cost Claim and Pre-financing JPA2	70	Archaeolingua	14,254
03-Feb-06	Cost Claim and Pre-financing JPA2	94	CHEDI	13,254
03-Feb-06	Cost Claim and Pre-financing JPA2	96	UNISI	51,700
10-Feb-06	85% adv JPA 13-30	16	CNR	6,800
10-Feb-06	Cost Claim and Pre-financing JPA2	74	CIMEC	20,800

13-Feb-06	Cost Claim and Pre-financing JPA2	2	PIN	190,515
13-Feb-06	Cost Claim and Pre-financing JPA2	3	Ename	276,850
13-Feb-06	Pre-financing JPA2 only	65	IST	12,750
13-Feb-06	Cost Claim and Pre-financing JPA2	46	II	12,260
13-Feb-06	85% adv JPA 13-30, cost claim Yr 1 & 85% adv JPA 18	31	UNIGE-ISME	16,259
13-Feb-06	Pre-financing JPA2 only	76	UNIREL	17,000
13-Feb-06	Pre-financing JPA2 only	21	UBO	17,000
15-Feb-06	Cost Claim and Pre-financing JPA2	30	ARCES	44,600
15-Feb-06	Pre-financing JPA2 only	81	Ciencia Viva	3,400
16-Feb-06	Pre-financing JPA2 only	86	SIMVIS	5,100
16-Feb-06	Pre-financing JPA2 only	98	CISA	10,200
23-Feb-06	Cost Claim and Pre-financing JPA2	33	CNR: ISCIMA-ITABC	4,150
23-Feb-06	Pre-financing JPA2 only	33A	CNR: ISTI	42,500
23-Feb-06	Cost Claim and Pre-financing JPA2	19	TU-BS	43,306
01-Mar-06	Cost Claim and Pre-financing JPA2	58	UNISI	13,200
01-Mar-06	Pre-financing JPA2 only	32	DS	3,400
25-Apr-06	Pre-financing JPA2 only	5	TU-Graz	36,195
			Total	1,228,331

Specific arrangements were implemented to allow dispersion of pre-financing for CNR (a single legal entity with multiple semi-autonomous research institutes involved in EPOCH) direct to the appropriate institutes. There were a few cases where despite notification to the named contacts for partners and email to the alternate contacts, the individual researchers were not informed by their organisations that pre-financing had been received. These cases tended to be where the partner had not already received pre-financing in JPA18 and/or where the contacts named had not been revised (as required in the consortium agreement).

In addition, after the pre-financing distribution had been implemented, some duties were re-allocated between partners.

The Ename Center returned responsibility and related pre-financing for the following activities as of 15 March 2006 as the key researcher responsible left the organisation.

Activity	Contribution Budget M25-30	Pre-financing (85% x CB M25-30)
2.5 (Research Agenda)	€3.0k	€2.55k
2.7 (Brokerage)	€3.0k	€2.55k
2.8 (SME Involvement)	€6.0k	€5.10k
3.3 (Common Infrastructure)	€25.0k	€21.25k
Total	€37.0k	€31.45k

In order to ensure continuity at this crucial time in the Period, the Executive Committee arranged a subcontract to Visual Dimension for these activities.

The EPOCH team led by Professor Dieter Fellner at the Institute for Computer Graphics at Technische Universität Braunschweig relocated during this Period to the Technische Universität Graz, both of whom are partners within EPOCH, and as a result the obligations and benefits were transferred at the end of the first six month period of Period 2. This involved return of some pre-financing from Technische Universität Braunschweig and a re-issue to Technische Universität Graz along with formal letters acknowledging the changes from the administrative contacts at both organisations.

There are two other instances of partner groups moving to organisations outside the Consortium. Professor Richard Beacham relocated from University of Warwick to King's College London and Daniel Pletinckx left the Ename Center to join Visual Dimension on a full time basis. In both cases the new organisations have been proposed and voted by the Consortium for full membership of EPOCH. Please see above Section 3 – 4.2 Contractors.

EPOCH's JPA is structured to include funding for “scalable activities” (see section 8.5.2 of the Technical Annex). The management of the Network has monitored the allocation of funds under this scheme and implemented transfers as the funds are authorised for particular activities. These activities are documented under the individual activities responsible for the funds.

Workpackage	Activity	Sub-Activity	Y2Q1			Y2Q2			Y2Q3			Y2Q4			Y3Q1			Y3Q2					
			M1	M2	M3	M4	M5	M6	M7	M8	M9	M10	M11	M12	M1	M2	M3	M4	M5	M6			
WP3 Jointly Executed Research	3.1 Coordinate research activities	Concertation Meetings																					
		Report on CH related IT research																					
		Reports on Concertation Meetings																					
	3.2 New tools	2nd Newton CFPs distributed																					
		Newton proposals collected												✓									
		Newton proposals selected												x✓									
		Report on CFPs for 2nd set of Newton projects																					
		Negotiation/Briefing meeting for 1st tranche Newton Teams																					
		Implementation of Tools (separate schedules - tbc)																					
	3.3 Common Infrastructure	Draft technology inventories																					
		6-monthly EPOCH Pipeline Description																					
		E-vote on Architecture and Components																					
		Design and benchmarking workshop																					
		Technical benchmarking review meeting																					
		Implementation/adaptation of open software tools/common infrastructure																					
WP4 Spreading Excellence	4.1 Web site	Review of functionality of the web site				✓						✓									✓		
		Web-site Operations and Maintenance report on web site																					
		4.2 Standards and evaluation	Submission of annual reports on standards activities																				
	4.2 Standards and evaluation	Participation in standards projects (as necessary)																					
		Report on good practice guides																					
		Report on spread of adoption of Ename charter																					
	4.7 Human resource development	Call for bursaries for next semester																					
		Evaluation/approval of bursaries proposals						✓						✓									✓
		Bursary scheme operations																					
		Call for course proposals for next semester																					
		Evaluation/approval of course proposals						✓						✓									✓
		Course activities																					
		Call for events and other dissemination proposals for next semester																					
		Evaluation/approval of event proposals						✓						✓									✓
		Events and other dissemination activities																					
		Special sessions at VAST/Associated Spring meeting																					
		Contributions to EC's web site and newsletter																					
		Project Presentation organization of VAST																					
	Annual report on Human resource Development																						
	4.8 Publications	Report on the State-of-the-Union																					
Publication operations																							
Report on publications																							

Please note that the granularity of activities reflected in this Gantt chart are more conditioned by the deliverables listed in the previous versions of JPA2 and hence not all of these specific sub-activities remain.

Annex 1 - Plan for using and disseminating the knowledge

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1 Executive Summary

This report describes the strategy and tactics adopted by the EPOCH network in the Use and Dissemination of Knowledge in Period 2.

The paper starts from EPOCH's perspective on the mission of integration applied to a sector centred around the interaction between cultural heritage and technology, and a number of dissemination activities are reported. EPOCH has a major commitment to using two events annually as foci for EPOCH project meetings and as venues for dissemination of the project results – VAST and CAA. Progress and developments in these activities are reported.

Other components of the dissemination and use plan include the enhancement of knowledge and skills of workers in the sector; dissemination through the website; provision of resources for other researchers and reporting experience of the use of standards to the appropriate bodies.

Finally, plans for the future are outlined and there are brief conclusions.

The details of events and publication activities undertaken by EPOCH are documented in the Periodic Activity Report.

2 EPOCH Mission and the Relationship to the Dissemination Strategy

As stated in the first Plan for Dissemination, delivered in Period 1, EPOCH is based on the premise that the cultural heritage domain and its interaction with Information and Communications Technologies are multi-disciplinary, but to date the sector has not managed to create a sufficiently integrated inter-disciplinary view. In each disciplinary area the levels of knowledge of cross-disciplinary areas are variable and any strategy which seeks to enhance integration must also use dissemination to raise cross-disciplinary know-how. Also, EPOCH's strategic choice of adopting an "inclusive" model of integration, i.e. one which seeks to influence the direction of as many significant players in the field as possible, as opposed to an "exclusive" one, i.e. one which seeks to establish the EPOCH consortium members as an exclusive elite which becomes a dominant force in the "market", has assigned to dissemination a paramount role in EPOCH's integration activities. As previously acknowledged, it is a matter of fact that although the consortium is rather large and includes a majority of the most important institutions in the domain, it would be impossible to include directly all the organisations which could claim to be able to contribute to the ERA, which probably number in the thousands.

EPOCH has identified an integration agenda at a number of levels and from a number of perspectives. EPOCH's perspectives on integration were presented in the proposal and restated in the Technical Annex; they were further refined in Period 2 JPA. The following needs for integration were identified, in order to establish the basis of the European Research Area:

- Integrating the disciplines themselves to create common perspectives and a solid interdisciplinary field
- Integrated research agendas to provide an agreed set of priorities for future developments
- Integrating the Cultural Heritage "sector" to bring the business/operational perspectives together

- Integrating the technological underpinning so that tools developed in one context may more easily be integrated into the operations of other organisations
- Data and data format integration so that data collected for one purpose may be re-purposed for other contexts and integrated with existing datasets and data collected in other exercises.

The dissemination strategy is an essential component of bringing the various communities together, with some events seen as one mechanism to bring different communities face to face; others, which have tended to develop their own disciplinary communities and perspectives, as an opportunity to provide improved interdisciplinary interaction and to widen the perspective of such focused groups.

Among the various communities, some have been identified as priority addressees of EPOCH's communication in Period 2:

- the museum community, including curators, directors, specialists and in general all those involved in collection management
- site managers and high level officers in heritage management, such as those involved in the management of individual monuments and sites and those coordinating heritage management at a regional/national level
- policy makers, including planning and regional authorities
- SMEs operating in the sector, usually creative or cultural industries.

Concerning the geographic scope, additional actions have been identified as appropriate, focusing on specific geographic areas like:

- Eastern and Central European Countries, in particular recent Members States
- The Mediterranean region
- America, including both USA and Latin America, with a selected presence based on key events
- The developing countries

The EPOCH strategy for dissemination and use of knowledge therefore has the following components:

- (i) To reinforce and extend interdisciplinary aspects of events, focusing resources in embedding the EPOCH interdisciplinary agenda into some key events.
- (ii) To disseminate the EPOCH message at events which EPOCH is not using as flagship meetings, but nonetheless have an audience recognized as significant for EPOCH's mission.
- (iii) To make the EPOCH website a strategic source of information for partners and others to encourage the sharing of information and promotion of the interdisciplinary agenda.
- (iv) To support specialist education and training by subsidising courses and staff mobility programs to improve informed take up of inter-disciplinary knowledge.
- (v) To disseminate technical experience gained in the use of standards.
- (vi) To interact at a strategic level with other groups operating at the ICT / Humanities interface in related areas, in order to reinforce strategic interdisciplinarity in all the related research agendas.

3 Implementation

3.1 Levels of EPOCH involvement

There are at least three levels of EPOCH involvement in all types of dissemination:

- a. Core activities which form part of EPOCH's funded actions to promote integration.

- b. Activities which EPOCH partners would be undertaking anyway, but where the EPOCH agenda is furthered by the partner because of their belief in that agenda and without assistance.
- c. Activities where EPOCH partners are supported in undertaking additional work with marginal support from EPOCH.

Each of these can make a valuable contribution to the EPOCH agenda of integration although it is clear that EPOCH cannot practically censor or control partner's engagement in activities where they are not in fact receiving much practical assistance in engaging in the activity.

3.2 EPOCH events

Two events used to be the cornerstones of EPOCH event activities - VAST (Virtual Reality Archaeology and Cultural Heritage) and CAA (Computer Applications in Archaeology). However two factors have made EPOCH adopt alternatives to the association with CAA in 2006. Firstly CAA2006 was held in the United States of America which made it inappropriate as a major venue for an FP6 major event. However, EPOCH was present at CAA2006 to avail of it as a step in its communication strategy outside Europe.

Secondly the EPOCH Executive and Board of Directors had decided that it would be a good idea for one of the two EPOCH events to be more focused on the museums sector. It has as yet proved difficult to identify a suitable event in the Museums field at an appropriate time of the year; as one with good museum penetration, EPOCH chose the EVA Florence event as the Spring EPOCH meeting in 2006.

The Network will continue to focus a large amount of effort in the dissemination and networking at two events annually - the annual VAST and CAA (or alternative) events. These give concentrated opportunities to discuss the best outputs from EPOCH and compare them with benchmarks elsewhere, as well as providing the environment for formal and informal meetings to progress the integration agenda for the EPOCH partners. Increasingly EPOCH is invited to help plan the programs for events, which allows EPOCH to assist in developing the cross-cultural value of these events.

3.3 EPOCH attendance at other events

EPOCH seeks to be active in meetings of appropriate groups spanning other interest groups. For example, the project has been represented at policy/agenda setting meetings at national and international levels (for example, the CER Conference organized by the EU Commission in Brussels in November 2005).

Thus EPOCH's dissemination and publication plans are not limited to VAST/CAA and a significant number of other opportunities to spread excellence have already been taken, or are in the pipeline (see the Appendix for a complete list). The approach here is largely tactical, seeking to combine opportunism to capitalise on partners' existing dissemination activities and plans by adding an EPOCH component, whilst being prepared to use small in-kind or financial support to secure good coverage of cultural heritage sectors and geographic regions. Decisions on use of EPOCH resources in this way are taken by the Executive Committee in consultation with the Workpackage 4 leader.

Special mention is worth making of the so-called "Regional meetings". These are events organized by EPOCH in collaboration with a local institution to disseminate the network's activity and goals. Several such events are planned, after the successful one already held in Krakow in January 2006 and addressing Eastern and Central European museum professionals.

3.4 EPOCH "In collaboration" events

A process will be established to allow those planning events to apply for "in cooperation" recognition by EPOCH and to use the EPOCH logo in publicity/web-sites etc. Potentially this recognition could be related to other aspects of EPOCH operations – for example including the potential of partners to apply for bursaries to allow suitably qualified people to attend the courses programs associated with good quality conferences. The two EPOCH stands have been updated and have been used regularly at events.

3.5 Publications

EPOCH publishes material in a variety of ways. There is an EPOCH branded book series which uses materials produced for courses or material produced for some conference. The essential mechanisms are similar to those for the events. Materials are either piggy-backed off partners' non EPOCH publication activity, or may be generated from other EPOCH activities. For example the proceedings of the workshop organized by EPOCH at UBICOMP05 have been published here.

Decisions on allocations of prioritisation of opportunities and application of resources are again taken by the EPOCH Executive with advice from the Workpackage 4 leader.

3.6 Education, Training and Mobility

This range of activities is intended to help better inform professionals for one aspect of the multi-disciplinary field about the state-of-the-art in other aspects. At the same time, those receiving support in this way are also benefiting from the interaction with other professionals in similar situations and with the lecturer or host. The key differences between the three headings concerns the level of program, the staff:student ratio, and the period of education or training. In this regard, the network is pushing towards a larger presence of Summer Schools and similar courses.

Decisions on allocations of prioritisation of opportunities and application of resources are again taken by the EPOCH Executive with advice from the Workpackage 4 leader. The Policy and Procedures Manual lays out conditions for this purpose, including the specifications of the circumstances which would be given priority support. At present eligibility criteria include the requirement for the candidate to be studying in a different country.

3.7 Dissemination via the website and internet

The presentations made by EPOCH partners will be routinely placed in the document section of the EPOCH website, or in the case of VAST full papers in the EUROGRAPHICS digital library. In addition, the website will be used for other forms of dissemination both within the consortium and more widely. For example, the first data sets have been entered into the repository during the first semester and other data has been added as it is produced by brokerage activities. A portal to open source software is also being developed.

The strategic importance of these repositories lies in the opportunity for cross-fertilising good practice, ideas and tools between research groups, and in the case of data sets, providing potential benchmarking for comparison of algorithms and results of novel methods of processing data.

3.8 Results

Papers presented at VAST2005 again show a large involvement of EPOCH researchers, very often co-authors with researchers coming from outside EPOCH.

It is EPOCH policy to obtain feedback from participants on all events run with subsidy from EPOCH. This is used both to monitor the participation rates in order to detect trends and monitor integration progress and also to improve the benefits for attendees.

The details of dissemination and use of knowledge undertaken by EPOCH, together with bursary distribution and website content and use, are documented in the Periodic Activity Report.

4 Conclusions

This report demonstrates that the Dissemination and Use of Knowledge plays a core part in meeting the EPOCH challenge of achieving a new, genuinely interdisciplinary field. EPOCH partners have substantial and continuing plans to disseminate the knowledge gained from, and the results of, their

work. These plans will continue to be kept under review and adapted in the light of experience and feedback.

Appendix – List of actual and planned events, and comparison with Period 1 plans

2.1 Overview table 1 – Comparison of actual dissemination with activity planned in Period 1

Dates	Type	Type of audience	Countries addressed	Completed as planned	Partner responsible /involved
12/5/2005	Exhibition	Museum professionals	UK	Yes	2
7-9/7/2005	Conference (EPOCH workshop on socio-economic impact)	Research	UK	Yes	1
25-29/7/2005	Conference (EVA London)	Research	UK	Yes	2
5-11/9/2005	Conference (EAA)	Research, heritage professionals	EU (Ireland)	Yes	2
6/9/2005	Conference (Hypertext '05)	Research, heritage professionals	EU (Austria)	Event cancelled by organizers	
21-23/9/2005	Conference (ICHIM '05)	Museum professionals	EU (France)	Yes	2
26-30/9/2005	Conference (CIPA)	Research	EU (Italy)	No	Presentation cancelled
3-7/10/2005	Conference (VSMM)	Research	Belgium	Yes	3
8-11/11/2005	Conference (VAST-EPOCH event)	Research, heritage professionals	EU (Italy)	Yes	33 / ALL
14-15/11/2005	Conference (EU event CER2005)	Research, industry (IT)	EU (Belgium)	Yes	1, 2, 3, 4
22/11/2005	Conference (EVA Jerusalem)	Research	Israel	Yes	2
Fall 2005	Meeting	Museum professionals, SME	Poland, Czech rep. Slovakia, Hungary	Delayed to January 2006	2,3
End 2005/ Early 2006	Meeting	Museum professionals, SME	Italy, Malta	Postponed to Period 3	2,3, others
Early 2006	Meeting	Museum professionals, SME	Nordic/ Baltic countries	Postponed to Period 3	2,3, others
Early 2006	Meeting	Museum professionals, SME	Spain	Postponed to Period 3	2,3, others
Spring 2006	Conference (Museums and the web)	Research, museum professionals	USA, EU	No	Presentation cancelled, excessive cost
Other major events taking place in Period 2, not listed in Period 1 Dissemination plan					

Dates	Type	Type of audience	Countries addressed	Completed as planned	Partner responsible /involved
11-14 September 2005	Conference UBICOMP05	Researchers	Worldwide		30, 52
25 November – 2 December 2005	Conference and course (UNESCO Conference)	Heritage professionals, site managers	Latin America and developing countries		2, 33, 48
23-25 February 2006	Conference (King's College Symposium)	Researchers	UK, Europe		2
3-7 April 2006	Conference (EVA 2006 Florence)	Researchers	Europe		1, 2, 3, 4, others
18-23 April 2006	Conference (CAA2006)	Researchers	USA, Europe		2, 52

2.2 Short description of events taking place in Period 2

1. **EVA 2005 Florence** (Firenze, Italy, 14-18 March 2005). EPOCH presented a report on the current activity of the project, and participated in networking sessions with Russian researchers attending the Conference to explore possible collaborations.
<http://lci.det.unifi.it/Events/Eva2005/eva2005.htm>
2. **CAA2005** (Tomar, Portugal, 21-24 March 2005). At CAA 2005, EPOCH organized a session (so-called "I9action session") to provide extensive information about its activity and interim results. A workshop on standards and a tutorial on CIDOC-CRM were also organized, see above. In a parallel exhibition, the project's showcases were demonstrated to conference delegates. As usual, the network organized here its BoD meeting and the General Assembly of its partners.
<http://www.caa2005.ipt.pt/>
3. **Museums and Heritage Show London 2005** (London, 11-12 May 2005). This is an exhibition usually visited by heritage professionals and managers, mainly from UK but also with an international attendance. EPOCH has participated with its stand, demonstrating its results and distributing promotional material. A number of contacts with interested visitors has been established.
<http://www.museumsandheritage.com/>
4. **Heritage Impact 2005** (Brighton, UK, 7-8 July 2005). This Symposium is unique in its genre and is organized by EPOCH and the University of Brighton. It deals with the analysis and evaluation of the socio-economic impact in the cultural heritage sector. The success of the first edition has suggested to replicate it in 2006.
<http://www.cmis.brighton.ac.uk/staff/epoch/index2005.php>
5. **EAA2005** (Cork, Ireland, 5-11 September 2005). The EAA annual conference gathers archaeologists from all around Europe. EPOCH has managed a booth distributing various illustrative material.
<http://eaacork.ucc.ie/>
6. **UBICOMP05** (Tokio, Japan, 11-14 September 2005). EPOCH has organized a workshop on "Smart Environments and their Application to Cultural Heritage" with 11 papers on heritage applications of mobile computing.
<http://www.ubicomp.org/ubicomp2005/>
7. **ICHIM05** (Paris, France, 21-23 September 2005) EPOCH made a presentation of its activity and results.
<http://ichim05.ichim.org/jahia/Jahia/>
8. **VSMM2005** (Ghent, Belgium, 3-7 October 2005) EPOCH has organized here two workshop on the "Effective Implementation of Technology in the CH Domain", and the "Role of SMEs in Cultural Heritage".
<http://belgium.vsmm.org/pages/program.html>
9. **VAST2005** (Pisa, Italy, 9-11 November 2005) The Annual International Symposium on Virtual Reality, Archaeology and Cultural Heritage has now reached its 6th edition, starting in 2000 in Arezzo, Italy and has become an appointment for the researchers of graphics and cultural heritage domain. It was preceded by four EPOCH workshops on 8 November: on Standards, on Research Trends and EPOCH's Common Infrastructure, on Socio-Economic Impact and on SME Encouragement. EPOCH bodies (EXC, Board of Directors, General Assembly) met during VAST.
<http://vcg.isti.cnr.it/vast05/index.php>

10. **Communicating European Research 2005** (Bruxelles, 14-15 November 2005) Organized by the European Commission's Directorate-General for Research, the International Conference and Exhibition was attended by EPOCH with a booth where dissemination material was distributed and demonstrations were held about its achievements.
http://ec.europa.eu/research/conferences/2005/cer2005/index_en.html
11. **UNESCO Conference "Use of Space Technologies for the Conservation of Natural and Cultural Heritage"** (Campeche, Mexico, 28 November – 2 December 2005). Jointly organized by UNESCO, ESA and Eurisy, in cooperation with INAH (Mexican Instituto Nacional de Antropología e Historia) with the support of EPOCH and other institutions. EPOCH presented the goals and results of the project to an international audience with a significant presence of Latin American researchers and heritage professionals. See the detailed program at
<http://www.eurisy.org/SITE/upload/PDFa/546FinalAnnouncement.pdf>.
12. **EVA Jerusalem** (Jerusalem, Israel, 29-30 November 2005) Organized by the Minerva Network in Israel. EPOCH participated organizing a session jointly with the partner IAA (Israel Antiquity Authority, the State agency for antiquities) on "Emerging technologies for Research and Dissemination of Cultural Heritage".
<http://www.minervaisrael.org.il/evaminerva.html>
13. **Heritage Presentation and Preservation – A Digital Perspective** (Hull, UK, 7 December 2005). A one-day workshop with a training/dissemination perspective, organized by the partner University of Hull with the support of EPOCH and other partners. For details of the program:
http://www.dcs.hull.ac.uk/simvis/research/simvis_archaeology/workshop/review.htm
14. **Information Technology and Heritage: EPOCH's solutions. A capacity building workshop for heritage professionals in Central Europe** (Cracow, Poland, 19-21 January 2006). The workshop has been the first of a series, planned to advertise EPOCH's activity at a regional level organized in co-operation with ICC, the International Culture Center in Cracow and AHICE, a network of heritage professionals from Central European Countries. It was attended by some 30 people equally distributed among Poland, Slovakia, the Czech Republic, and Hungary.
<http://www.mck.krakow.pl/view.php?id=4&idm=26>
15. **Ontologies in Humanities: Archaeology, Architecture and Cultural Heritage** (Florence, 27 January 2006) A seminar organized with the collaboration of the Faculty of Architecture, University of Florence with some 30 participants from several Italian Universities.
16. **Making 3D Visual Research Outcomes Transparent** (London, UK, 23-25 February 2006). An Invitation Symposium and Expert Seminar promoted by The British Academy, London and The Centre for Computing in the Humanities at King's College London and organized by The AHRC Methods Network and PIN. The symposium was attended by about 50 people with 10 lectures, it included an expert seminar that eventually produced a draft of a charter about the credibility of 3D reconstructions.
<http://www.kvl.cch.kcl.ac.uk/Symposium/index.html>
17. **EC FP7 brainstorming workshop "Digital Libraries and Living History"** (Luxembourg, 27th Feb 2006) 20 experts were invited to attend the two day event and debated around the research priorities represented in the title of the event. As with all such events the title reflects some expectation of the intended target, as does the selection of the invitees. In this case the balance was probably weighted more towards digital libraries, their services rather than the monuments, sites and museums communities.
18. **EPOCH WORKSHOP, ICCROM**, (Rome, 5–7 March 2006)
This workshop was the latest in a series of activities undertaken under the EPOCH "Stakeholder needs" and "Research agenda" activities. Following the latest meeting convened, a report

drawing together the feedback gained in a series of meetings has been brought together [19], summarising the consultations and proposing a resulting structuring of the “common research agenda” being developed in EPOCH under three areas, as follows:

- Capturing technology: recording and documentation
- Interpretation, management and conservation technology
- Presentation and dissemination technology

19. **New Heritage Conference: Beyond Verisimilitude** (Hong Kong, 12-14 March 2006)

This event was attended by about 60 delegates drawn primarily from professionals in the interpretation and presentation of cultural heritage. The event was significant in that the work presented was, in the main, targeted at the use of new media in the presentation and interpretation of cultural heritage. This focus highlighted the continuing and, if anything, expanding needs for curatorship skills, since the digital artefacts in themselves constitute cultural artefacts in their own right. These skills need to be enhanced in view of the complications that are introduced by technological obsolescence, the relatively fragile media used for longer term digital storage, and the continuously evolving formats recorded on those media.

20. **Grand Challenges in Computer Science Conference** (Glasgow, Scotland, 22-24 March 2006)

This event was a combination of the annual event of the Conference of Professors and Heads of Computing (CPHC) and the UK Computing Research Committee (UKCRC). It was attended by about 130 academics (mainly Professors) of Computer/ Computing Science. The majority were from the UKCRC which targets membership from the most research active in CS research and has a definite Science orientation (as opposed to Engineering).

21. **Preserving Our Past workshop** (Birmingham, England, 29th March 2006)

The “Preserving Our Past” workshop was called by four of the UK’s research Councils (Arts and Humanities; Natural Environment; Economics and Social Sciences; Engineering and Physical Sciences) with English Heritage. Delegates had to write a 2 page case to be invited to attend and those who were successful met for a discussion on all aspects of the research needed to “Preserve Our Past”. Part of this agenda was of direct relevance to the IST community. A total of 87 attendees debated five themes:

- Integrated Methodologies
- Values
- Engagement and Interpretation
- Impact of Climate Change on the Historic Environment
- Sustainability

22. **EVA Florence 2006** (Florence, Italy, 3-7 April 2006). At EVA Florence, EPOCH has organized workshops on the first day on Standards, the Research Agenda and the Common Infrastructure, attended, in the average, by some 50 people each. A presentation was given in the plenary. EPOCH bodies (EXC, Board of Directors, General Assembly) met during EVA Florence 2006.
<http://lci.die.unifi.it/Events/Eva2006/eva2006.htm>

23. **EUROPEAN WORKSHOP ON CULTURE & TECHNOLOGY** (Pistoia, Italy, 8-9 April 2006)

This workshop brought together a selected group of 19 senior people interested in the issues involved in improving the use the cultural heritage sector makes of technology, and the research issues that need solving to realise the potential.

24. **UK Arts and Humanities Research Council, ICT Research Methods Expert Seminar on Virtual History and Archaeology** (Sheffield, UK, 20-22 April 2006)

This expert seminar brought together around 40 researchers, the majority of whom were users of technologies in support of their research in the arts and humanities. A great many of these researchers were working from documentary sources, rather than artefacts, although in some cases the boundaries became blurred.

25. **CAA2006** (Fargo, ND, USA, 18-23 April 2006). EPOCH followed the CAA overseas organizing an active presence, consisting of a presentation panel session, attended by some 30 people and followed by a discussion and a number of positive contacts; a booth with printed material and live demos; and a tutorial on CIDOC-CRM. The very successful mission in USA proved the opportunity of extending the presentation events outside Europe.
<http://www.caa2006.org/>

2.3 Planned dissemination for Period 3

Plans for Period 3 include:

a) participation in EU-organized events, as

- IST event in Helsinki (21-23 November 2006)

b) Scientific Conferences; among others:

- Heritage Impact 2006, already planned for 29 and 30 June in Brighton. A Symposium following last year's one focused on the socio-economic impact of cultural heritage, organized by the University of Brighton. (<http://www.cmis.brighton.ac.uk/staff/epoch/index2006.php>)
- The VAST2006 Conference, this year planned to take place in Nicosia, Cyprus from 30 October to 4 November 2006. It will be a joint conference with other international organizations (CIPA, EG) with a focus on the Mediterranean Region. (<http://www.vast2006.org>).
- CAA2007 in Berlin (<http://www.caa2007.de>).
- General agreement with EVA International to use their well-established events to disseminate particularly in regions where no other EPOCH event is planned (Eva Moscow, Eva Vienna, Eva Jerusalem).

b) Museum and heritage related events

- Best in Heritage, Dubrovnik, Croatia, 21-23 September 2006 – organized by ICOM, ICOMOS and the local Ministry of Culture (<http://www.thebestinheritage.com/home.php>).
- Cultural Tourism – Economic Benefit or Loss of identity?, Dubrovnik, Croatia, 27-28 September 2006 – organized by European Association of Historic Towns and Regions (EAHTR) (<http://www.historic-towns.org/>)
- The Interactive Salon. Stockholm, Sweden, Autumn 2006. An event organized by EPOCH and the local partner TII, showcasing ICT design; the space will emphasise cultural heritage that has a relevance to ICT developers, Cultural Heritage practitioners, researchers and media creators.
- Dire & Fare, Carrara, Italy, 15-18 November 2006. An exhibition of innovation in local administration organized by ANCI, the Italian Association of Municipalities and Local Government. Appropriate to contact local policy makers (<http://www.dire-fare.net/index.php>).

- BMTA (Borsa Mediterranea del Turismo Archeologico), 16-19 November 2006, Paestum, Italy. An event promoting archaeological sites and their connection to cultural tourism, focused on the Mediterranean area. (<http://www.borsaturismo.com/2006/ENG/Presentation/Presentation.htm>)

c) Regional events

EPOCH has already planned several regional events:

- Nordic Countries, during the already mentioned Interactive Salon
- Spain, in Autumn 2006
- Italy, in Spring 2007

Other regional events will be organized during the second half of 2006. Such events aim at disseminating EPOCH's goals and achievements to the local heritage community and follow the formula of the successful Krakow one. In some countries, dissemination material in the local language will be produced.

Such events had already been planned for Period 2, but had to be postponed.

d) Dissemination in third countries

After the successful events in India (Period 1), USA and Mexico (Period 2) we are considering the opportunity of having a selected presence at major events in key overseas countries as for instance USA, Mexico, Brazil, India and Australia. Opportunities will be finalized by September 2006. In general, EPOCH will rely on a local institution, with which there already exists a co-operation, to organize a presentation day during another event (like, for example, the planned Eva Brasileira, at end 2006-beginning 2007) or in an autonomous way. In fact, it has been shown that such dissemination opportunities are very much welcome by local researchers and professionals, who are eager to establish contacts with EU organizations and projects. Such events may also be the starting point for future collaboration with countries that already have a collaboration agreement with EU (as USA, India or Australia) or others for which the Commission has launched co-operation programs, as the countries of Latin America. In general, costs are reasonable and return very high. For every event, a focus subject will be selected among those more relevant for the host country: for example, virtual repatriation of heritage of former colonies (India), the exploitation of native culture (USA and Australia), pre-European cultures and their importance for the national identity and the country development (Latin America), and the potential of technological applications on these issues will be demonstrated.

Overview table 2 – Planned dissemination for Period 3 (only major events)

Planned dates	Type	Type of audience	Countries	Size of audience	Partner responsible /involved
29-30/06/2006	Conference (Heritage Impact)	Research	Europe	80	1
21-23/09/2006	Exhibition (Best in Heritage)	Museum professionals	Europe	150	2
30/10 to 4/11 2006	Conference (VAST2006)	Research	Europe	50	new Cyprus partner
Autumn 2006	Exhibition (Interactive Salon)	Research, professionals	Nordic countries	300?	46
15-18/11/2006	Exhibition (Dire & Fare)	Local government, policy makers	Italy	300	2
16-19/11/2006	Exhibition (BMTA)	Cultural tourism	Mediterranean region	500	2
21-23/11/2006	Conference (IST Event)	EU IST event	Europe	1000	2
various dates	EVA Conferences	Research	Russia, Austria, Israel, Brazil	150 (each)	2
Autumn 2006	Meeting	Museum professionals, SME	Nordic/ Baltic countries	30	2,3, others
Autumn 2006	Meeting	Museum professionals, SME	Spain	30	2,3, others
Spring 2007	Meeting	Museum professionals, SME	Italy	30	2,3, others
Overseas dissemination					
TBD (end 2006)	Event	Research, heritage professionals	Mexico & Latin America	?	2
TBD (end 2006 – early 2007)	Event	Research, heritage professionals	Australia	?	2
TBD (March 2007)	Event	Research, heritage professionals	India	?	2
TBD (Spring 2007)	Event	Research, heritage professionals	USA	?	2

Annex 2 - EPOCH Expertise Centres

Forum Trust, Norwich, UK

- John Smith (john.smith@theforumnorwich.co.uk)
- Bryn Davies (bryn.davies@theforumnorwich.co.uk)
- website : <http://www.theforumnorwich.co.uk/>
- EPOCH Affiliated Partner

The Forum is a Millennium Commission Lottery Project. It is a unique landmark building situated within the heart of the cosmopolitan city of Norwich. It was built to house a new state-of-the-art library replacing Norwich's central library that tragically burnt down in 1994. It is now a dynamic and exciting centre for information, learning and entertainment. It is the 'hub' of lifelong learning in Norfolk, a 'gateway' to Norfolk and Norwich and much, much more...

The Forum is a £63 million project and was funded by a £31.5 million grant from the Millennium Commission with matching support from Norfolk County Council, Norwich City Council and the business community.

The Forum Trust is a charitable organisation established to manage the both the building of The Forum (the capital project) and to manage, develop and co-ordinate the building and its services for 125 years from the date of completion of the capital project.

In addition, the Trust will seek to encourage opportunities for personal development and life long learning through the provision of facilities for study, learning and training including the establishment of the hub of a developing network in Norfolk and beyond for the dissemination of knowledge.

The Trust receives no subsidy of revenue funding. It therefore operates commercially in order to meet its objectives in such areas as building maintenance and refreshment of the visitor attraction, Origins.

The Trust directly manages the Origins attraction, shop and the car park. It is developing a cultural and recreational amenity for the community through an entertainment and activity programme in the atrium and on Millennium Plain, and to the extent that it can add value to customers of The Forum, it will also co-ordinate the activities of its tenants.

CultNat, Giza, Egypt

- Director : Fathi Saleh (fsaleh@mcit.gov.eg)
- Ranya Boraie (rboraie@mcit.gov.eg)
- Websites : <http://www.cultnat.org> (see also <http://www.eternalegypt.org>)
- to become EPOCH Partner

The Egyptian Cultural Heritage is of a worldwide interest and importance due to its continuity over a period of more than seven thousand years. It started since prehistoric times and flourished during the Pharaonic, Greco-roman, Coptic and Islamic periods. That is why it encompasses various aspects of human civilization, monitors the development of human heritage and represents a cultural heritage of national and international value. Moreover, the material culture associated with the archaeological sites in Egypt amounts to a considerable percentage of the world cultural heritage. There is an increasing need to take measures towards the documentation and preservation of this unique cultural heritage.

On the other hand, Egypt possesses a wide variety of natural resources representing various habitats and a wealth of animal, bird and plant species. Some of these sites and organisms are already protected

while others suffer from various dangers and threats. They all need to be accurately and purposefully documented.

In addition to the documentation of the tangible and intangible (arts and folklore) cultural and natural heritage of the country, the Center has set for itself the following objectives:

- The implementation of the national plan of action towards the documentation program, making use of the most up-to-date information technology in collaboration with the national and international specialized organizations.
- Increasing public awareness of the cultural and natural heritage using all available media.
- Capacity building of professionals in the fields of conservation and documentation of cultural and natural heritage.

Development as an Expertise Center

CultNat has reached a point whereby it is considered as an "expert" in the field of documenting heritage and the Center participates as consultants in this field in many local and international projects. Additionally, the Center is developing its expertise in the area of offering training modules in specific fields such as Geographical Information Systems (GIS) in Archaeology and Information Technology in Museum Management; other modules planned are short courses in archaeology, Cultural Heritage Management, Documentation of Monuments, Conservation Philosophies and Policies in the Arab States and Under Water Heritage. CultNat aims to broaden its scope to include "research" and thus in the long run be viewed as a "Cultural Academy".

Heritage Lab - PIN, Firenze, Italy

- director : Franco Niccolucci (niccolucci@unifi.it)
- Sandro Saccenti (sandro.saccenti@gmail.com)
- website : <http://www.pin.unifi.it/>
- EPOCH Coordinating Partner

PIN srl was founded in 1992 as a non-profit organisation owned by the University of Florence (still its major shareholder), the Municipality of Prato, the Province of Prato and other local institutions (as the Chamber of Commerce, etc.) to provide local high education services, promote and organize research.

It started its activities in the present venue of Piazza Ciardi 25 in Prato, recently enlarged and refurbished with the construction of a new wing. Its activities started since the beginning with the management of several de-centralized university courses in Engineering, scientifically depending from the University of Florence with which PIN maintains tight connections. The course offer has substantially increased since then, reaching now 4 faculties (the fifth is due on next academic year) and 14 graduate and postgraduate courses (Laurea, Laurea Specialistica and Master according to Italian official definitions).

PIN's activity is twofold:

- Management of university courses in collaboration and under the scientific supervision of the University of Florence, which maintains the responsibility for academic staff selection and curricula development. There are several degrees from the Faculties of Engineering, Economy and Commerce, Political Sciences, Letters.
- Management of research, controlled by the internal Scientific Committee (formed by professors, scientist and experts appointed by the Board of Directors) and performed through internal laboratories. These include:
 - several Engineering labs, among others on telecommunications, on the environment, cooperating with the Italian Space Agency, and on civil engineering, with a wind gallery for testing built structures (recently they tested the model of the planned bridge to Sicily, which

- will be one of the longest in the world);
- a Political Science lab, working on labour and negotiation;
- a Social lab, working on social problems as less-favored groups (women, minors, immigrants);
- a Heritage lab, which will be in charge of the EPOCH project, working on IT applications to Cultural Heritage.

All these labs are supervised by a professor of the University of Florence, develop applied research and work on a self-funded basis, that is public donors and funding agencies, while PIN provides basic infrastructure and administrative services. Researchers are employees of the University of Florence or have temporary contracts with PIN.

Virtual Heritage Centre, Rome, Italy

- Maurizio Forte (Maurizio.forte@itabc.cnr.it)
- director : Lucrezia Ungaro (museofori@libero.it)
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- to become EPOCH partner

The Virtual Heritage Centre will be an organisation with two departments, a museum and a research centre. The museum hopes to open in October 2007 and will be located at the Trajanum Market. The VHC is supported by the City of Rome and CNR.

Centro Andaluz de Arqueologia Iberica, Jaèn, Spain

- Alberto Sanchez Vizcaino (vizcaino@ujaen.es)
- director : Arturo Ruiz (arruiz@ujaen.es)
- website : <http://www.ujaen.es/centros/caai/>
- EPOCH Full Partner

The Centro Andaluz de Arqueología Ibérica was founded in 1998 in the framework of the II Research Programme of the Regional Council (II Plan Andaluz de Investigación), following the agreement between the regional Education and Science Authority (Consejería de Educación y Ciencia de la Junta de Andalucía) and the University of Jaén.

This research centre has as its major aims:

- i) to promote and carry out research in the field of Iberian culture;
- ii) to provide the necessary conditions for appropriate preservation of Iberian heritage, and
- iii) to transfer to society the achievements of the first two aims, research and preservation.

Taking these general objectives as a starting point, the CAAI is currently following several research lines: The dialectic relationships between landscape and territory; between the past and the present; and interdisciplinary research.

Currently, the CAAI is formed by 7 researchers (all lecturers at the University of Jaén), 6 researchers working in specific research projects, 4 researchers outside the University working in Public Administration in projects related to the management and diffusion of historical heritage, and 2 administrative and technical staff. The CAAI has recently taken possession of new premises, greatly facilitating the work of the Centre.

The Interactive Institute - Visions for Museums, Stockholm, Sweden

- Halina Gottlieb (halina.gottlieb@tii.se)
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- EPOCH Full Member

Interactive Institute is an experimental IT-research institute which creates results through combining art, design and technology. The institute consists of different research groups, which is called studios. Each studio has a unique orientation, where the fundamental idea is that a mix of different disciplines will create new results and new ways of working. Examples of orientations are: games, smart products, sound, energy, trends and learning.

Interactive Institute is a research organisation aiming at conducting and publishing research of the very best quality. At the same time the institute is innovation-oriented and focuses on creating concepts for new digital products, services and businesses. The ultimate goal is to develop people, increase their skills and visions of the future and thereby their abilities to build these visions into results of public utility.

Visions for Museums is a II Studio and explores the ways which digital technologies may develop and enhance visitor interaction within museums of art, culture, history and science, as well as at heritage sites and attractions. V4M aims at being a centre of interdisciplinary research and practice regarding visitor-oriented new media in museums.

The Swedish Institute of Computer Science (SICS) owns the Interactive Institute (II). The Foundation for Strategic Research, previous owners of II, is still a funder of the institute. SICS also owns two other IT research institutes: Santa Anna in Linköping and the Victoria Institute in Gothenburg (91%). The ownership of SICS is held by the Swedish ICT Research, an organization owned by the Swedish government and industry.

UNESCO World Heritage Centre, Paris

- Lon Addison (a.addison@unesco.org)
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- To become EPOCH member

Lon Addison, responsible for technology in the UNESCO World Heritage Centre, is creating a new expertise centre in Los Angeles, California, USA.

Region Kop van Noord-Holland, Schagen, Netherlands

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- EPOCH Full Partner

Gewest Kop van Noord-Holland, located about 50 miles North of Amsterdam, is a regional public authority. Its policies originate in and are transferred by the local municipalities in the region, Texel, Den Helder, Wieringen, Wieringermeer, Zijpe, Schagen, Niedorp, Harenkarspel and Anna Paulowna. Main policies within a broad scope of activities within regional development are sustainable tourism and cultural heritage. In the action programme Kop en Munt, run by the RDA, Gewest, municipalities, county council, Department of Defence, the agricultural sector and some companies are defining and supporting feasible projects and opportunities, a lot of these in tourism.

Although quite small, the region is very rich in cultural heritage, with highlights as the largest settlements dating to the Neolithic Single Grave Culture, the oldest and largest enclosure dike in the world, a unique ring of High Medieval defensive structures, tangible and intangible Napoleonic heritage (a unique ring of fortresses and battlefields) and last but not least Viking treasures. The area has two parts that are on the tentative UNESCO World Heritage List (Groetpolder-De Gouw and Western Wadden Sea).

Developing cultural heritage in the North of North Holland initially is a bottom up process. Local initiatives are brought further and supported by the RPA., thus giving way to socio-economic development and impact. The marketing strategy defines four themes of international CH/cultural

tourism importance : Neolithic, Normans (as a synonym for Vikings), Nuwendoorn (high MA) and Napoleon. Linking these themes, the monuments and the intangible heritage, all municipalities in the region are likely to profit.

In development, Gewest Kop van Noord-Holland and its subdivisions like the Bedrijfsregio, which manages to be a platform of public and private enterprises and matchings, already worked on stakeholder needs (EPOCH 2.1) and experienced learning with ICT in the 5th Framework CHIMER project. Relative outsiders, working together with and in the region are the Dutch Viking Foundation, part of the international Destination Viking cooperation (about 30 sites and museums from Canada to St. Petersburg and from Iceland to Sicily) and the Association of Museums (20; the collections varying from local to international importance). On an international level, there is an established cooperation between the region and Ename, Norfolk Museums Service in Norwich, and between the region, the county council of North Holland and the county council of Norfolk. There is ample knowledge of tourism and cultural heritage, as well as employment, education, fundraising and European affairs, but in fact hardly any match between the CH / tourism sectors and the SME / ICT companies. Gewest Kop van Noord-Holland may be developed as a hub, with a lot of satellites around it. Some satellites are enclosed in the nucleus, which is important for political support and funding. County and national organizations are likely to participate, which expands the limits of the region. The main focus will be on tourism and cultural heritage combining this with special ICT needs.

Limburgs Museum, Venlo, Netherlands

- Floris De Jonge (f.dejonge@limburgsmuseum.nl)
- director : Wim Hupperetz (w.hupperetz@limburgsmuseum.nl)
- website : <http://www.limburgsmuseum.nl/>
- To become EPOCH member

The Limburg Museum created a project and support department that creates and supports projects on archaeology, monument care and cultural heritage education, with a staff of 7 people. This functionality has been commissioned by the Provincial Government of Limburg.

MiraLab, Geneva, Switzerland

- Nedjma Cadi (cadi@miralab.unige.ch)
- director : Nadia Magnenat-Thalmann (thalmann@miralab.unige.ch)
- website : <http://www2.miralab.unige.ch/>
- EPOCH Full Partner

MIRALab was founded in 1989 by Professor Nadia Magnenat-Thalmann and is composed of more than 30 researchers coming from many different fields, such as computer science, mathematics, medical field, design, architecture, fashion design, cognitive science, etc. The group is truly interdisciplinary, working in the field of computer graphics, computer animation and virtual worlds. Since 1992 the group has participated in more than 45 European Projects. International conferences are often organised in Switzerland by MIRALab. Moreover, MIRALab participates in different manifestation such as fashion defi les with virtual models and clothes.

The group has produced more than 300 papers, 50 books and a dozen of PhD thesis. Former PhDs have become Professor in renown Institutes like Indian Institute of Technology, University of Zaghreb, for example or working in renown companies like Alias-Wavefront in Toronto, Softimage in Montreal, PDI Dreamworks in California, Samsung in Korea, IBM Switzerland or BUF Compagnie in France.

International Cultural Centre, Krakow, Poland

- Agata Wařowska-Pawlik (wasowska@mck.krakow.pl)
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- to become EPOCH member

The International Cultural Centre is a specialist research institution that also has a role in education and promotion of culture and the arts in terms of all aspects of Europe 's cultural heritage. It is open to co-operation on a regional and international scale, and attempts to respond to both the interests of elite groups and the needs of the general public. The International Cultural Centre is divided into three units:

- The Centre for the Promotion of the Arts and Sciences
- The Research Institute of European Heritage
- The College for New Europe

The Research Institute of European Heritage is mainly concerned with studying and preserving European heritage. Chief among its fields of interest are:

- the development of a new methodology of research on heritage;
- the recognition, scientific development and valuation of the heritage of Central and Eastern Europe;
- the development of heritage management strategies for historic cities;
- studying the problems of cultural regions and culture-inspiring activity of national minorities and borderland cultures;
- the recognition of Polish heritage abroad.

The RIEH implements this programme through conferences, seminars, research projects, educational work, publications, exchange of experiences and promotion of European cultural heritage studies. The Institute attaches great weight to promoting the exchange of experiences and to the interdisciplinary approach to European heritage issues.

Essential to the implementation of these programmes are Polish and foreign experts cooperating with the Institute. The projects undertaken provide model solutions that can be applied in studying and preserving the heritage of two- and multicultural regions in Europe.

In the field of bilateral relations, the Research Institute of European Heritage places special emphasis on cooperating with the countries neighbouring Poland.

In 2001 the International Cultural Centre and the Malopolska School of Public Administration at the University of Economics in Cracow brought into being a course for postgraduate students – the Academy of Heritage . The objective of the Academy is to educate specialists who could effectively meet the challenges of the modern heritage preservation.

Education in the area of heritage resources management has become more and more important in recent years. Free market laws, transformation of social structures and systems of values, economic and political reforms, European integration, progressive globalisation – all these problems put cultural heritage in a new situation. This is the reason why the Academy programme includes the issues of the contemporary theory of heritage, history of culture, law, economy, marketing and managing, regional policy and development, and cultural policy.

This offer is aimed at monument preservation service personnel, local and public administration workers, civil servants, museum, university and cultural institution employees, teachers, and investors.

In the autumn of 2003, the first edition of the course came to a close, and recruitment for a new edition started, aimed first and foremost at teachers. They have to meet the challenges connected with the reform of the education system. The new system includes the creation of “heritage classes”, the introduction of the philosophy of open regionalism into teaching programmes, and adjustment to educational standards in force in the countries of the European Union.

Workshops will constitute a part of particular importance in the course. They are to acquaint students with modern and attractive forms of disseminating the knowledge about cultural heritage preservation and its role in new reality of market economy.