



IST-2002- 507382

EPOCH

**Excellence in Processing Open
Cultural Heritage**

Network of Excellence

Information Society Technologies

**D.1.8 Periodic Activity Report for Period 3
(including Periodic Report on the distribution of the Community's contribution)**

Due date of deliverable: 14 June 2007

Actual submission date: 15 June 2007

Start date of project: 15 March 2004

Duration: 4 Years

Professor David Arnold, University of Brighton

Project co-funded by the European Commission within the Sixth Framework Programme (2002-2006)		
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

Contents

Contents	2
Publishable Executive Summary	4
Section 1 – Project objectives and major achievements during the reporting period.....	12
Section 2 – Workpackage progress of the period.....	18
1 Workpackage 1 Management.....	18
1.1 Workpackage objectives and starting point of work at beginning of reporting period.....	18
1.2 Progress towards objectives – tasks worked on and achievements made with reference to planned objectives, identify contractors involved	18
1.3 Deviations from the project work programme, and corrective actions taken/suggested: identify the nature and the reason for the problem, identify contractors involved.....	18
1.4 List of deliverables, including due date and actual / foreseen submission date.....	18
1.5 List of milestones, including due date and actual / foreseen achievement date.....	18
2 Workpackage 2: Integrating activities	20
2.1 Activity 2.1 Sector Watch.....	20
2.1.1 Starting point, progress and achievements against objectives	20
2.1.2 Deviations from plans and corrective actions	21
2.2 Activity 2.5 Research Agenda	21
2.2.1 Starting point, progress and achievements against objectives	21
2.2.2 Deviations from plans and corrective actions	21
2.3 Activity 2.6 – Socio-economic impact.....	21
2.3.1 Starting point, progress and achievements against objectives	21
2.3.2 Deviations from plans and corrective actions	22
2.4 Activity 2.7 – Brokerage.....	22
2.4.1 Starting point, progress and achievements against objectives	22
2.4.2 Deviations from plans and corrective actions	24
2.5 Activity 2.8 – SME support	24
2.5.1 Starting point, progress and achievements against objectives	24
2.5.2 Deviations from plans and corrective actions	26
3 Workpackage 3: Jointly Executed Research	27
3.1 Activity 3.1 Coordinate research activities	27
3.1.1 Objectives and starting point	27
3.1.2 Progress and achievements	28
3.1.3 Deviations and corrective actions	29
3.2 Activity 3.2 Development of New Tools	30
3.2.1 Objectives and starting point	30
3.2.2 Progress and achievements	30
3.2.3 Deviations and corrective actions	33
3.3 Activity 3.3 Common Infrastructure.....	33
3.3.1 Objectives and starting point	33
3.3.2 Progress and achievements	34
3.3.3 Deviations and corrective actions	37
4 Workpackage 4.....	38
4.1 Activity 4.1 Web site	38
4.1.1 Objectives and starting point	38
4.1.2 Progress and achievements	38
4.1.3 Deviations and corrective actions	41
4.2 Activity 4.2 Standards.....	41
4.2.1 Objectives and starting point	41
4.2.2 Progress and achievements	41
4.2.3 Deviations and corrective actions	42
4.3 Activity 4.7 Human resource development.....	42
4.3.1 Objectives and starting point	42
4.3.2 Progress and achievements	42
4.3.3 Deviations and corrective actions	45
4.4 Activity 4.8 Publications.....	45
4.4.1 Objectives and starting point	45

4.4.2	Progress and achievements	45
4.4.3	Deviations and corrective actions	45
Section 3	– Consortium Management	46
1.1	Objectives of Management Workpackage (from section 9.6.1 of JPA3):	46
1.2	Contractors	49
1.3	Periodic report on the distribution of the Community’s contribution	50
1.4	Project timetable and status (GANNT chart from JPA3).....	63
1.5	Measures of Integration	66
1.6	Risk Management	72
1.6.1	Approach	72
1.6.2	Risk Register	73
Annex 1	- Plan for using and disseminating the knowledge.....	78
Contents	78
5	Executive Summary	79
6	EPOCH Mission and the Relationship to the Dissemination Strategy.....	79
7	Implementation.....	80
7.1	Levels of EPOCH involvement.....	80
7.2	EPOCH events	81
7.3	EPOCH attendance at other events	81
7.4	EPOCH “In collaboration” events	81
7.5	Publications.....	81
7.6	Education, Training and Mobility	82
7.7	Dissemination via the website and internet.....	82
7.8	Results.....	82
8	Conclusions	82
Appendix	– List of actual and planned events, and comparison with Period 1 plans	83

Publishable Executive Summary

This report highlights the achievements of the EPOCH NoE in Period 3 of the Project covering the period from 1st May 2006 to the 30th April 2007. During this period there were a number of major achievements and a great deal of incremental progress on the objectives of the project. The numbers of researchers involved has grown substantially since the start of the project and the gender balance of those involved has improved.

There have been four major outputs from the project in this period:

D2.11 The EPOCH Research Agenda (1st Complete Draft)

D.2.13 - Sustainable Projects and Enterprises

D3.6 Progress on the Common Infrastructure, including first results from the NEWTON projects

D.4.11 - State of the Union - second report

as well as an extensive report on the dissemination activities of the project

D.4.12 - Spreading Excellence

The EPOCH Research Agenda has been issued in English and Italian in both print form and as a web-download. Almost 2000 copies have been distributed to date with downloads from the website running at around 200 copies per month.

The EPOCH Research Agenda presents an analysis of the current state and future directions of research in ICT specifically inspired by the needs of the cultural heritage sector. Starting from an overview of the place and challenge of Cultural Heritage in ICT research the activity has highlighted the need for close interdisciplinary working between cultural heritage and ICT professionals if resources are to be focussed on the most appropriate ICT research. Five hypothetical future scenarios for particular work situations involving cultural heritage professionals and the areas of ICTs that require additional research to support the scenarios envisaged have been identified. The needs have then been grouped over the five scenarios and the specific research issues elaborated.

The five scenarios are:

Scenario 1: Site excavation – Virtual Excavation Support Teams

Scenario 2: Community museums – Hybrid Eco-museum & Community Memory

Scenario 3: Educational experiences – Heritage classrooms without walls

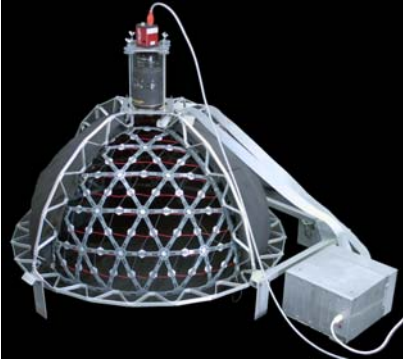
Scenario 4: Heritage management

Scenario 5: Environmentally endangered sites – Large-scale industrial heritage site

The research implications of the scenarios structured according to a number of business processes typically undertaken by cultural heritage professionals include:

- Data Capture over a full range of Cultural Heritage data types
- Documentation
- User created content
- Intelligent Tools
- Digitisation of Legacy Metadata
- Search and Research, including Semantic and Multi-Lingual Processing
- Visualisation and Presentation
- Specific Issues for Web Access and Dissemination
- Mobile, Distributed and Networked Systems
- Long term preservation and upwards compatibility

The mechanisms, pace and time horizons for the adoption of the results of ICT research in practice have been considered, as well as the next stages in achieving an agreed research agenda.



© ETH Zurich and KU Leuven, 2006

(D.2.11 – Research Agenda)



© Ename Centre for Public Archaeology and Heritage Presentation, 2004

(D.2.11 – Research Agenda)

Elsewhere within Work package 2, Activities 2.6 (socio-economic impact), 2.7 (brokerage schemes), and 2.8 (encouragement of SME involvement) are part of EPOCH's commitment to enhancing enterprises involved in cultural heritage and their management processes and the role that ICT can play in this. Deliverable D2.13 shows the results of these Activities and provides an overview of how an enterprise can both understand how and where it fits in the broader cultural heritage sector and how it can engage in EPOCH's activities to lead to self improvement of the enterprise and development of the sector. Enterprise development and network mechanisms (and models) are shown to drive technological innovation, knowledge creation and transfer, value creation and holistic socio-economic impact evaluation. The combination of these activities is developing networks and strategies designed to provide sustainable support for the cultural heritage sector.

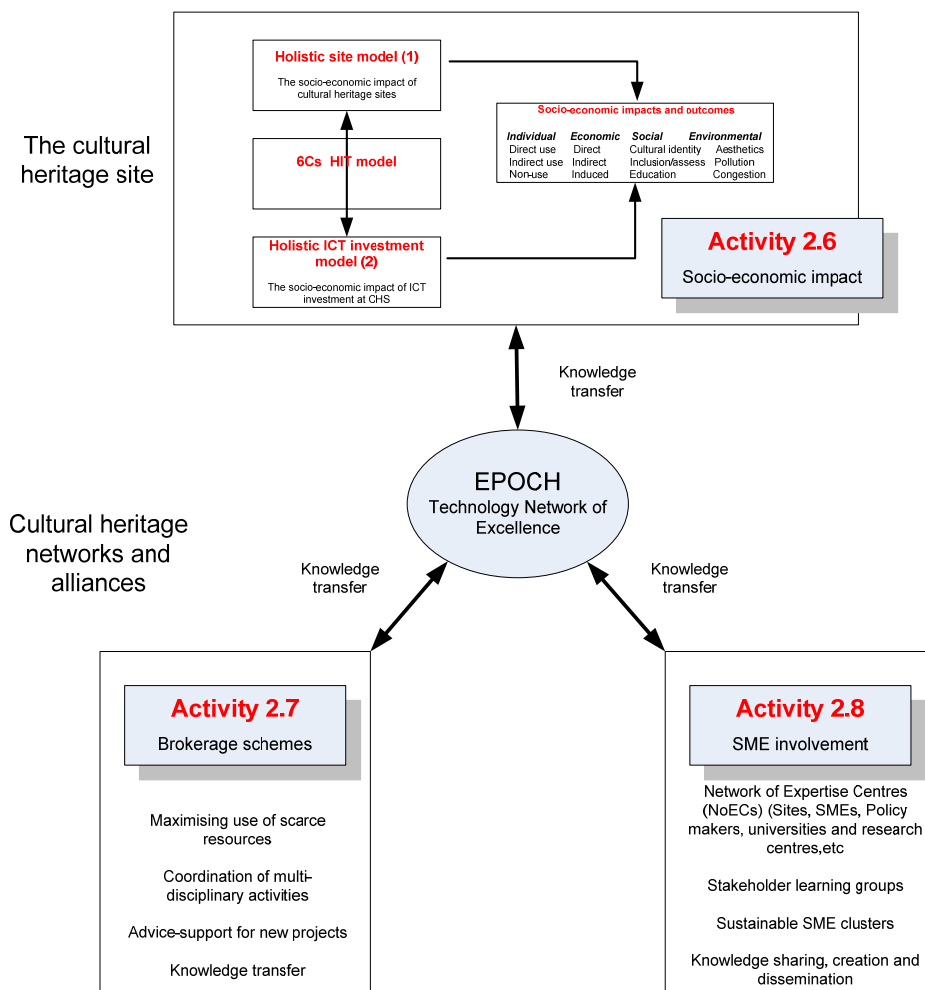
The Activities all aim to facilitate the creation and addition of value to the cultural heritage sector. This is achieved through networks and alliances, amongst the EPOCH partners and within the wider heritage sector. The various activities are closely related, providing a different perspective on the same issues in the sector – localisation, complementarity, fragmentation and mutual inter-reliance. For example, the holistic models generated by the Activity 2.6 research will enhance understanding of the business and management processes associated with heritage sites, the deployment of ICT at those sites and the resulting socio-economic impacts. These models are designed to lead to practical tools for heritage managers and to help policy makers capture the wider picture of socio-economic impact from technology investment in the cultural heritage sector. These socio economic impact models can be disseminated using a number of traditional methods (literature, courses, conferences etc), but will be greatly enhanced by utilising the Expertise Centres (and the brokerage activity) for both dissemination and as a route to seeking feedback and experimental trialling. The experience from their use within the expertise centres feeds back into further refinement of the models.

Understanding enterprise processes, brokerage of expertise and advice, and the development of Networks of Expertise Centres all have the potential to release and add value for the cultural heritage sector. This sector, as with many not-for-profit activities, is facing ever-increasing pressure to improve professionalisation and sustainability with diminishing overt “subsidy”, which needs to be rather more rationalised as an investment in an activity which is more than capable of demonstrating a return to the investors. This return needs to be demonstrated in terms of meeting the investors’ objectives rather than a purely financial return.

The initial research that EPOCH has conducted has revealed that the skills and understanding required to appreciate the strategic role of individual enterprises, the processes of managing their development and the broader importance of the cultural heritage sector, are in short supply. These EPOCH activities will:

- Increase understanding of how the heritage “system” works and the dynamic nature of its socio-economic impact.
- Exploit this knowledge to make resources go further and help support new projects.
- Disseminate this knowledge to the sector.
- Develop mechanisms for knowledge creation and transfer.
- Enable the sector to use these mechanisms to help create a self sustaining infrastructure for mutual support, skills enhancement and problem solving.

The ‘Joint Value Creation’ in Workpackage 2 has a real potential to make a long-lasting contribution to the strategic direction of the cultural heritage sector.



(D.2.13 – Sustainable Projects and Enterprises)

The goal of the jointly executed research in WP3 is to provide the infrastructure and the tools to build cultural heritage applications from. As illustrated in the information processing view of the process (cf. Figure 1), there are three parts in solving this problem:

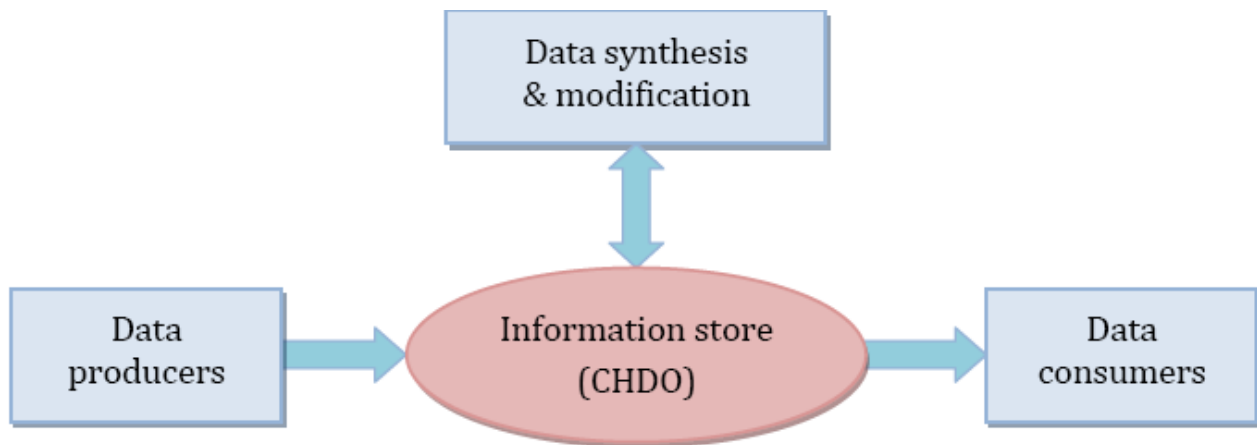


Figure 1: Information processing view of the cultural heritage processing pipeline. (D.3.6 – Progress on Common Infrastructure)

First of all an appropriate set of tools to operate on the cultural heritage data is needed. These tools produce data, ranging from text input over sound to video and 3D scanning; they use data, e.g. for display; or they modify existing data, by enhancing and/or synthesizing the data. The main research activity in WP3 is situated in this tool development area. D3.6 describes the tool development in the Common Infrastructure (WP3.3) and the development of additional new tools (WP3.2). There is a strong interaction between these two sets of tools.

Data are exchanged between the tools through an information store, also called the Cultural Heritage Data Object in the previous deliverable. This information store does not necessarily correspond to a physical storage such as a database, but it may. For instance, when data is processed within an application in a single pipeline, the intermediate data can be kept in memory. But when different applications are using and exchanging information, a more formally defined storage implementation may be required. D3.6 proposes an implementation of such a cultural heritage information store based on an existing content management system.

Finally, exchange formats (shown by the arrows in Figure 1) must be defined to guarantee a proper exchange of information. For long time preservation additional requirements need to be met. Epoch is not proposing to define new or adapted standards in these areas since, in our opinion, enough standards for our goals are available. In fact there are often rather too many to choose from, so we propose guidelines to select an appropriate standard instead. D3.6 therefore contains some agreed guidelines for selecting standards for multimedia and 3D. Of course, this infrastructure must be validated against real cultural heritage processes. So the deliverable also illustrates how this infrastructure fits into the archaeological process. Finally the report describes two planned chains of tools which will be used not only to demonstrate how to use the tools in an application, but also to test compatibility through the interaction of the tools and the exchange of data between them. The report ends with some appendices which contain extra technical information about some of the topics covered.



Figure 10: MobiComp VisitorGuide and staff information system.

(D.3.6 – Progress of Common Infrastructure)

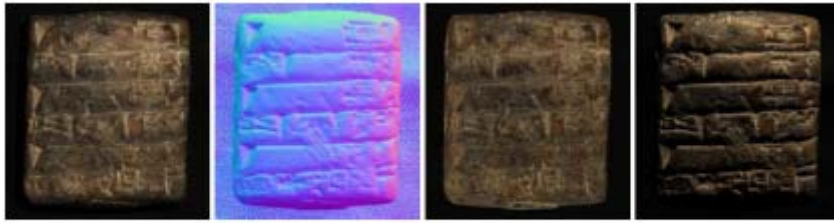


Figure 16: From left to right: One of 264 captured images of a cuneiform tablet; recovered normal map (colour coded in the usual way); recovered albedo map and a virtual re-lighting.

(D.3.6 – Progress of Common Infrastructure)

The final major output is the second issue of the report on the “State Of The Union” on the use of Information and Communication Technologies in the field of Cultural Heritage. This adopts a different approach from the first “State Of The Union” report. Apart from completing the information on the European countries provided in the first issue of the Report with reports from Sweden (by Halina Gottlieb) and Bulgaria (by Hristina Staneva) included as an appendix, the papers of this volume deal with general issues.

The two main contributions by David Arnold and Neil Silberman approach the core of the problem from opposite – and complementary – perspectives.

David deals with the technological challenges arising when applying IT to heritage content. However, his approach is not positivistic. He is aware that the many peculiarities of heritage challenge the ability of technology to cope with the needs of users and applications. The statement appearing early in his paper that “there may be as many digital representations of a single artefact as there are purposes for their creation” pairs with the statement that in archaeology “theory creates objects”¹. In another passage, a similar concept appears: tangible heritage, the primary target of digitization activities, incorporates intangible features and interpretation. David’s consciousness of the blurred border between intangible and tangible, data and interpretation, objects and context, theory and facts, may be the better warranty that the answers he gives here to a number of very practical questions aren’t just a cookbook of easy recipes. Nonetheless, the result is not discouraging. Heritage professionals are invited to take part, as essential protagonists, in the search for better tools, as described, for example, in EPOCH’s Research Agenda and its revision.

Silberman regards the problems standing in the middle of the cultural debate. He identifies four main issues, i.e. heritage conservation, common understanding among scholars, marketisation of culture and the social function of heritage. In examining these areas in detail, Neil clarifies some technological problems with great precision. Firstly, he points out that information management problems are not a mere question of agreeing on common data structure, but they derive from different approaches, histories, habits, methodologies and research focus: in a word, from the diversity of the ontologies different specialists use. Exploring how this diversity can be managed may turn IT from a mere facility into a substantial pillar for “innovative, multidisciplinary forms of historiography”. The same concept is expressed as a must on the IT side by Martin Doerr, when he states, as quoted in EPOCH’s Research Agenda, that without ‘fundamental’ investigation on research processes, question and discourse, “research on other topics would continue to be ‘blind’ what the real issues are.” In Silberman’s description, conservation, marketisation and identity problems share the common issue of sustainability. It is generally accepted that heritage must be preserved, that it has to achieve some degree of self-sustainability and that it has a social value going well beyond “study, education and enjoyment” insofar as it provides a sense of collective, although diverse, identity. Much debate has recently taken place on the common roots of Europe and if these should be explicitly quoted in the European Constitution; however, they are crystallized in the archaeological sites, the historic buildings – including churches and synagogues – and the monuments that populate the European landscape, and they are under the eyes of every citizen and of every visitor. Exploiting this commonality together with individual contributions to collective social memory indeed creates new challenges to technologists and to the capacity of culture professionals to cope with a tumultuous growth of user-created content, needing

¹ I. Hodder (1999) *The Archaeological Process* London. Blackwell, p. 84

systematization, verification and supervision. Neil advocates that “ICT can take the lead in monitoring the long-term economic dimension” for the “effective shaping of future policies and development designs”.

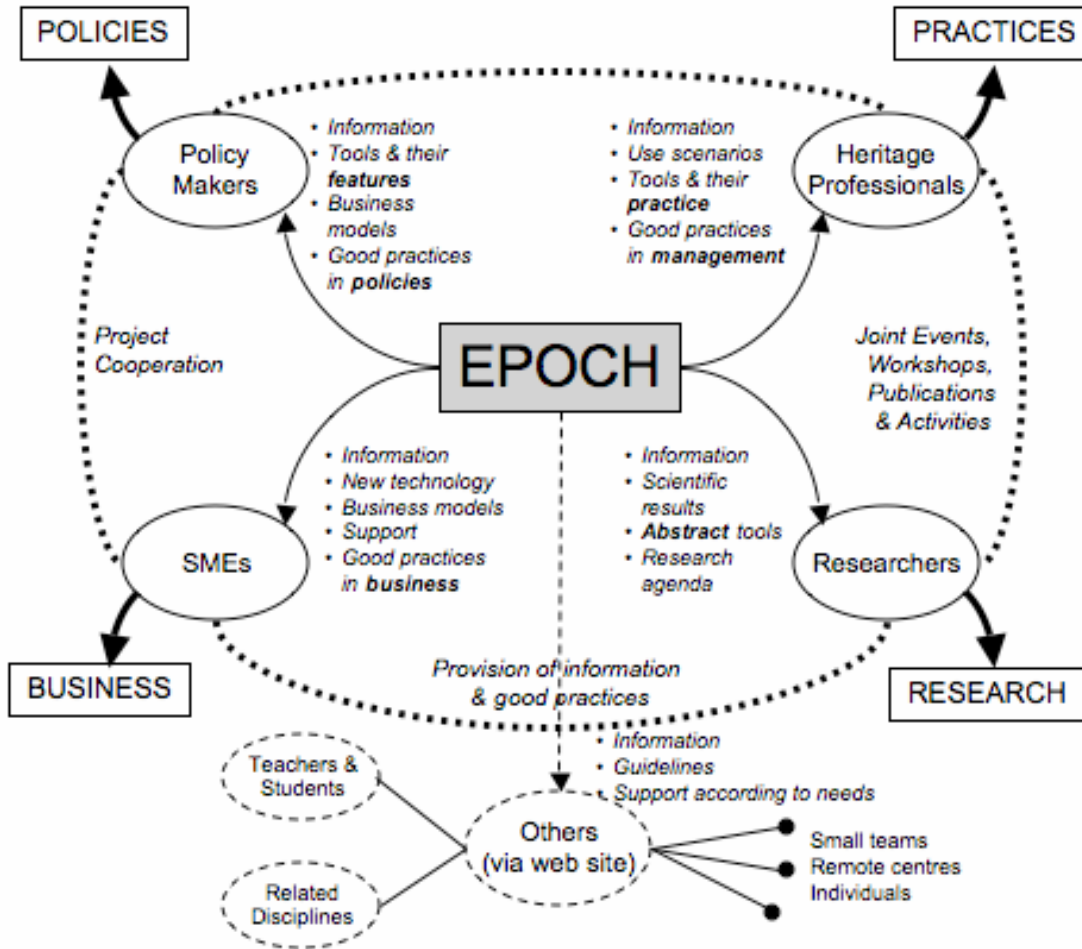
The economic issues underlying sustainability as outlined by Neil Silberman are dealt in the next two papers, a survey by Kaminski, McLoughlin and Sodagar of the methods used for valuation of heritage in Europe and an economic analysis by Pignataro and Rizzo of how preservation should be undertaken.

This economic perspective completes the picture of this report, which is the natural complement of EPOCH’s Research Agenda. On the one hand, it aims at providing the policy framework in which research priorities are placed. On the other, it gives an approach to these issues that may be of some interest also for who is not professionally involved, or personally interested, in detailing future avenues for technological CH development, but simply believes that heritage keeps an important place in the post-modern 21st century society, although incorporating the technologies which already play such a relevant role in everyday life.

EPOCH’s strategy for spreading excellence is described in the deliverable D4.12. The strategy is based on the recognition of several target communities, each requiring a different approach. The main ones are the research community, the heritage (museum, monument and sites) community, SMEs and policy makers. Other communities exist, of course, and are addressed mainly through the web site www.epoch.eu, and the public at large, to which EPOCH’s presence in mass media is targeted. EPOCH tools for dissemination consist of the web site, events and publications. Some other EPOCH activities, as EPOCH initiative in Networks of Expertise Centres reported above, also produce dissemination as a side effect. For these tasks EPOCH has created a dissemination toolkit, consisting of leaflets, presentations and an easily transportable collapsible stand.

After listing the dissemination events that took place in year 3 and the volumes published in the same period, the report deals in detail with four exemplary cases, demonstrating the substantial impact of EPOCH’s dissemination.

EPOCH's Dissemination



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 Autonoma 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; Regency Town House, UK; Salzburg Research Forschungsgesellschaft, Austria; Rijksdienst voor het Oudheidkundig bodemonderzoek (Dutch National Service for Archaeological Heritage - ROB), Netherlands; Visual Dimension bvba, Belgium; King's College, London, UK; CINECA, Italy; C2RMF, France; F.O.R.T.H., Greece.

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

The overall objective of EPOCH remains to improve interdisciplinary collaboration of the professional disciplines contributing to the interaction between technology and the cultural heritage of human experience as manifest in the tangible heritage of monuments, sites and museums. 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. These activities need to be 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 now comprises 94 partners, who are listed above and the work is organised in four major work packages, including Management; Integrating Activities; Jointly Executed Research and: Spreading Excellence.

Period 3 started with the consolidation which had been successfully achieved in Period 2 being again subject to some destabilisation with the definition phase for a new JPA3 work plan following so soon after the formal agreement of JPA2. However because EPOCH had successfully established much of the cooperation and mutual understanding on which to build future development during the early part of the project the period of redefinition and resulting disruption was kept to a minimum. However the development of the new JPA was complicated by two factors:

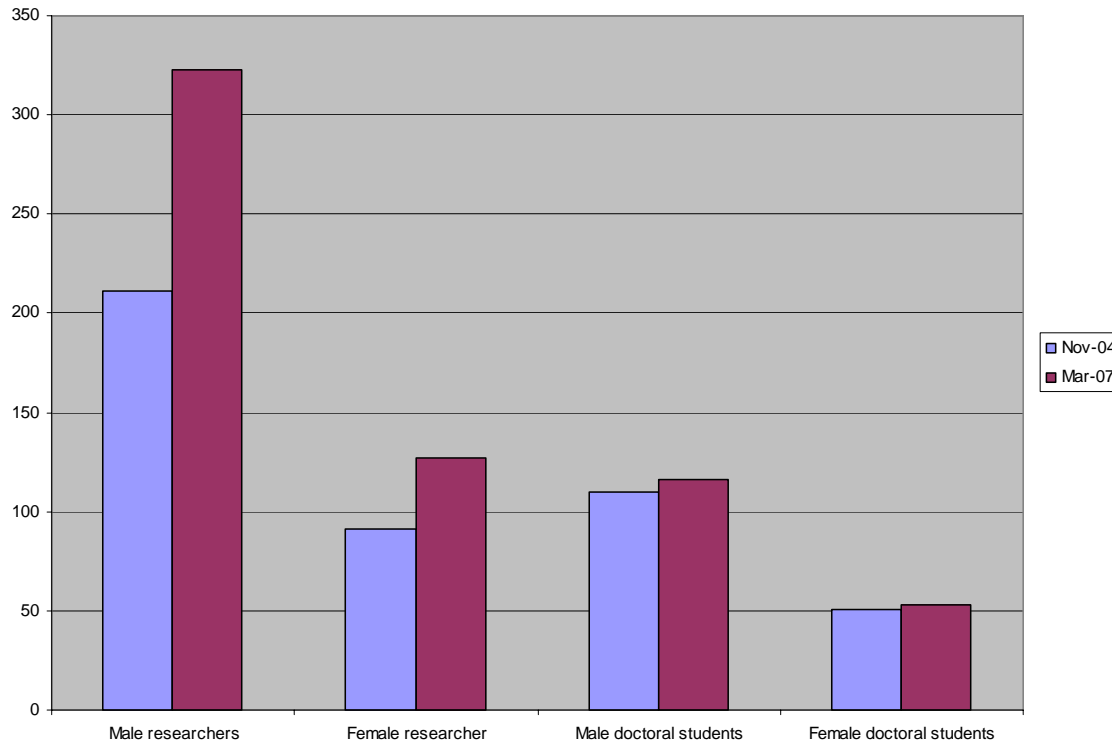
- The need to build any carry-forwards of activity and budget explicitly into JPA3
- The changed requirement to have completed the detailed final JPA3 description before the Cost Claim could be approved

Operationally the consequence of the first change was that the detailed JPA3 could not be developed until all the cost information from JPA2 had been finalised. This affected the degree to which alternative plans could be put in place to offset late implementation of aspects of JPA2. The period also proved administratively difficult in other ways particularly with the incorporation of the new partners and the reorganisation of both budget and activities to adjust to the new partnership. This particularly impacted on work package 2. The period whilst the old JPA is being reported and the new defined appears to be one in which reporting requirements make it hard for the project leadership to maintain the partners' impetus. The practical effect remains that a process designed to produce an agreed JPA3 as a fully considered development of JPA2 was initiated within the project around Month 22 and not formally agreed until over a year later. It seems clear that undertaking this process for the development of JPA4 would result in the formal approval being achieved after the end of the funded period.

The practical impact of these processes is a distraction of the leadership effort and an inevitable loss of momentum. The project leadership continues to take action to maintain the energy of the partnership, and progress is 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 that although much of the organisational framework is in place, EPOCH has yet to achieve the widespread adoption of the Affiliated Participant concept. In practice the project has a large number of affiliates, but without a formal status. These participate in many of the activities alongside EPOCH partners including participation in the learning clusters around the Centres of Expertise, but their formal status will probably only be recognised in the last period. The intention to elect a researcher from project partners for membership of the Executive, which was delayed in Period 2, has been achieved, but the desire to duplicate this process for the Board of Directors has now been abandoned since there are only two more scheduled meetings of the Board within the funding period. To undertake the election 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 been completed and the numbers registered as participating in EPOCH has risen appreciably since the first census taken at project proposal time.

EPOCH Gender Balance 2004 / 2007



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. A third Heritage Impact symposium is planned for June 2007 and the one held in 2006 has led to the production of a proceedings volume. In view of this success EPOCH is planning another event for June 2008 (i.e. the activity is planned to continue beyond the EPOCH funded period) when the event will be combined with the main Atlas conference and hosted in Brighton.

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 Expertise Centres is becoming well established and demand for additional activity continues to grow rapidly. The process is being well received by participants who are putting significant and increasing resources into the development. Norwich Forum Trust – who host the first EPOCH Centre of Expertise – have used the support network developed under EPOCH in the planning of a radically new strategy for the Norwich Millennium Origins visitor centre. 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 as reported extensively below and in Deliverable D3.6. 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. However, real progress has been made in adopting standardised interfaces and starting to use the tools in linked tool chains to develop cultural heritage content involving digital artefacts developed with multiple tools.

The new Project domain (www.epoch.eu) has been launched and is well received and the volume of data in the various digital asset libraries continues to expand. The on-line management tool has gone through more iterations and has been populated with the projects historic data to ease the assimilation into the working practices of the consortium members. However the ongoing administrative pressures and uncertainty of the status of JPA3 plans meant that the decision was again taken that the assimilation of that data into the new system could not be undertaken in parallel with the current reporting round. Historic data has been entered into the system which should make the rapid incorporation of the tool into reporting that much easier.

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

The following recommendations were made in the written report following the Review meeting held in July 2006. Each recommendation is followed by a brief description of how it has been taken up by the Consortium:

1) General issues:

a) **Dissemination:** pursue the ongoing work aimed at increasing the visibility of EPOCH. Making the web site a key resource centre for those interested in “ICT and cultural heritage” is part of this process. The ideas put forward by the project and the review team, some of which are mentioned in this report should be explored (e.g. streamlining the access to the research pipeline information, make available more documents, upload / feedback facility for EPOCH tools, Google Earth links)

The publication section has been enriched and the tools already available may be reached and downloaded from the EPOCH web site. The results are evidenced by access statistics (please see the report on the web site) particularly concerning downloads.

b) **Exploitation:** the discussion of the **longer term sustainability** of the activities of EPOCH should be pursued, considering the implications of **alternative exploitation** models (e.g. “open-source”, traditional licence per user). A general framework for intellectual property rights of EPOCH resources (e.g. software tools, models, databases of organisations) should be prepared.

D3.6 contains indications about the way in which future accessibility to the EPOCH tools is being prepared. This information has been included as systematically as possible. The strategy chosen depends on the tool. The availability scheme depends on the level of support required by the tool (and the level of expertise required from the user) as well as the amount of background information and the willingness to create spin-off companies from the side of the developers. This information about the level and type of access will be clarified more and more firmly with the final WP3 deliverables, and also links up with the activities of the Network of Expertise Centres and their specific take-up plans.

c) **Deliverables and Reports:** the quality of the written documents needs to be raised to the same level as the live presentations. In general the documents have a very comprehensive descriptive component but the analytical perspective is not sufficiently developed and the conclusions deriving from such analysis are often missing.

Analysis and conclusions have been improved in the deliverables in Period 3. It must be noted that analysis of the management data and in particular, that relating to the Cost Claim itself, is constrained by the timing between the end of the Period, and submission to, and collation by the Coordinator.

d) **Project Management:** pursue efforts aimed at improving the effectiveness of quality management (e.g. production of deliverables and other reports, follow-up of NEWTONs). Develop the formative dimension of the self-assessment / evaluation work. Put more emphasis on the collection of quantitative indicators of the achievements of EPOCH.

A formal review process has been implemented, but has been hampered by the availability of potential reviewers during the FP7 first call submission phase. The EPOCH Review college website is now up and running but the conflict of the major round of reviewing with the availability of reviews in the preparation and processing of FP7 has meant that direct approaches have been adopted to get reviews undertaken in a timely fashion. Some additional metrics have been collected – for example the data above on the composition of EPOCH researchers as a whole – which augments the measures already available, for example the attendance at events – but it remains challenging to define the appropriate metrics in the face of partner concerns on confidentiality. This would impact for example the collection of statistics on the submissions of bids under FP7 call 1. The projects main gathering was at VAST 2006 which had an attendance of around 270 about a third of whom were from EPOCH partners. Another quantification of impact is the monthly download of approximately 200 copies of the research agenda (as reported under WP4), but the benchmarking of such indicators remains problematic in the absence of a way of determining how many downloads should be expected (in this case).

2) Joint Programme of Activities

a) Integrating Activities

i) The **research agenda** must be urgently taken forward. Its development must engage the broader EPOCH and cultural heritage communities.

A first volume of the Research Agenda has been produced and widely distributed, for example at exhibitions and meetings. The input to this volume was given by a wide range of specialists inside and outside EPOCH. The EPOCH community has been invited to give feedback, the distribution of the Research Agenda, through physical copies and presentations, has reached a substantial number of cultural heritage specialists. The Agenda has been translated into Italian since many cultural heritage professionals do not operate in English and plans are being developed for Spanish and French versions for similar reasons.

ii) The **socio-economic models** need to be validated on more real cases and their concrete application further developed (e.g. case studies). It is also desirable to integrate in the approach more classical management tools (e.g. SWOT analysis).

The socio-economic models have been further refined and validated through several case studies. Major attention has been paid to provide concrete tools and methodology to perform the impact modelling and measurement. A training methodology has been developed, concrete training for cultural heritage specialists and further validation of case studies has been planned in period 4.

iii) The concept of **networks of centres of expertise** is good, but it needs further elaboration. The relationship with the brokerage needs to be clarified as well as the organic development of the centres (e.g. criteria for accession of new members). A formative evaluation of the first centre can be a useful tool.

A very concrete description of the functionality of an expertise centre has been defined and several expertise centres have plotted their functionality and plans against this. A detailed evaluation of all expertise centres has taken place, resulting in the selection of centres that are

capable of taking up this task. After more than one year of operations, the first operational expertise centre (Norwich) has been evaluated in detail. Linked to this assessment, a step by step plan has been developed to make the Network of Expertise operational. This plan includes a description of the integrated brokerage activities and a methodology how to make the Network grow step by step and how to support the expertise centres in their tasks.

iv) The actual degree of development of the **brokerage** scheme(s) is unclear. There is a need to demonstrate that the mechanisms in place can provide results in an efficient manner and can lead to a sustainable service. This calls for a more systematised view of how brokerage operates, its articulation with the centres of expertise and the sector watch and a more detailed reporting of this activity.

As the integration of brokerage into the Network of Expertise was the key target in period 3, several activities have been executed to define and test brokerage as an integrated service in the Network of Expertise. The focus has been on setting up thematic working groups, that bring together experts in new, emerging fields (such as Location Based Systems and Archaeological Information Systems), and on defining technology transfer and other brokerage mechanisms.

b) Jointly Executed Research

i) The set-up of a **Common Infrastructure** must address a number of aspects which go beyond the development of individual tools such as: assessment and validation of the component modules, their swift integration into **tool chains** (covering communication / data exchange mechanisms), the usability of the resulting systems and the preparation of suitable services and end-user scenarios.

The development of the Common Infrastructure and Newton tools clearly reaches beyond improving the state-of-the-art in any single domain. To that end, and in agreement with the recommendation, the project has defined two Tool Chains, that are meant to show the interoperability between tools through actual implementations. These are not intended to be realistic in terms of content though. As to the user community the project will in parallel elaborate a set of scenarios. These will advise on how to combine tools in order to reach specific goals. The project has also spent due attention to the selection of formats and standards, and the majority of EPOCH tools already abide by these guidelines.

ii) The Common Infrastructure should be extended to the NoE as a whole and be used to encourage interactivity and participatory behaviour.

The EPOCH consortium consists of partners with very different profiles. Absolutely not all of them are developers. Tool development had to reach a minimum level of maturity before interaction with e.g. users would make sense. But this is now happening more and more. The organisation of several courses about the tools by now testifies to this evolution.

c) Spreading Excellence

i) EPOCH must be widely recognised as **THE network of excellence in "ICT and cultural heritage"**. The cooperation with other NoEs in related ICT domains (e.g. interfaces) would contribute to this goal.

EPOCH is acknowledged in an increasing way as THE Network of Excellence in ICT and cultural heritage. CIPA has signed an agreement with us. UNESCO is considering our products for recommendation to site managers. The Italian Ministry of Culture is considering adopting the London Charter as a recommended practice. The European Museum Forum has

asked us to be their consultant for ICT related matters. We have established a cooperation with English Heritage (UK) and INRAP (France), who are not EPOCH partners. We have signed agreements with several museums for collaboration. The Norwich Origins Visitor Centre has been consulting with the EPOCH NoEC based in Norwich over the plans for developing the Centre, which are now being implemented. Several institutions, including museums, universities and SMEs have asked to become partners.

There have been the two joint seminars with DELOS and BRICKS about interoperability, one held at VAST06 in Nicosia, Cyprus and the second in Pisa, Italy (see the dissemination report) and the joint presentation at VAST06 of four projects on CH. We also participated in concertation meetings and offered cooperation to other projects.

ii) Pursue the effort to **engage** more of the **existing partners** in the activities of the NoE and associate to the initiatives of EPOCH more **organisations** from the **Cultural Heritage community**

Dissemination activity is already engaging a large number of partners, and a large number of heritage organizations are becoming involved, among others:

- **EMF (European Museum Forum)**
- **UNESCO - World Heritage Center**
- **English Heritage (UK)**
- **C2RMF and INRAP (France)**
- **Centro Andaluz de Arqueologia Iberica (Spain)**
- **RACM (National Authority for Heritage) (The Netherlands)**
- **Flemish Ministry for Culture and Heritage (Belgium)**
- **MIBAC (Ministry for Culture and Heritage) Italy**
- **Roman Fora Museums (Italy)**
- **Museum for the History of Science, Florence (Italy)**
- **Hungarian Academy of Sciences (Hungary)**
- **Niedersächsischen Landesamt für Denkmalpflege (Germany)**

Most of the above concern cooperation/case studies with one or more individual institutions.

In conclusion Period 3 of EPOCH has continued to be a balancing act but the Network is undeniably much better established and in the technical level some substantial tools have been developed. Some potentially very powerful collaborations are forming on the basis of a kernel of activity in EPOCH and we expect to see new projects developing under FP7 from a basis in the EPOCH partnership.

The key challenge in the coming period will be to formulate organisations and cooperations which will thrive beyond the funded period, strengthening existing partnerships and establishing the formal entities that will 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 work programme, 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
D1.8	Periodic Activity Report for P3	1	R	PU	38	38
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

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
M1.5	VAST06: results of elections to Executive Committee and Board of Directors	1	32	37	1
M1.6	Review College secure QA website operational	1	32	37	1
M1.7	Online Management Tool operational	1	32	35	1

M1.8	Gender Action and IPR working groups set-up	1	34	36	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 - *achieved*, 38, end of project)

2 Workpackage 2: Integrating activities

This report describes the work carried out under WP2 at the level of the five activities of this WP, and this for the period 1 May 2006 - 30 April 2007.

2.1 Activity 2.1 Sector Watch

2.1.1 Starting point, progress and achievements against objectives

The Ename Center has provided, conform the JPA3, a good update of the stakeholder needs and technologies available and a background for providing concrete scenarios and case studies. It has structured input from the other partners, and input from different meetings and workshops in this update and overview.

To obtain this input, the Ename Center organised two meetings of the ICIP (ICOMOS International Scientific Committee on Interpretation and Presentation), one in Paris in September 2006 and one in Ghent in March 2007, and an international colloquium in Ghent in March 2007. International experts provided input and discussion concerning the role of emerging digital technologies for cultural heritage. Also at other meetings and conferences, such input was collected.

At the VAST2006 conference in Cyprus, PIN and Visual Dimension organised a workshop on user scenarios, proposing and discussing a template for these user scenarios, and presenting a wide variety of scenarios and case studies for museums, monuments, landscapes and archaeology. Feedback from the audience helped to validate these proposals.

At the VSMM conference in Xi'an, Visual Dimension organised a similar but smaller workshop on user scenarios, where about 20 experts gave valid input for validation of three user scenarios. Visual Dimension has prepared several scenarios on archaeology, landscape visualisation, virtual musea, museum object interpretation, educational games in a museum and archaeology context,

Kop van Noord-Holland has provided information on the use of digital technology in cultural heritage tourism.

CHEDI has selected to create user scenarios on :

- recording and documentation of architectural heritage
- rapid digital condition assessment for heritage conservation
- 3D digital anastylosis of cultural heritage objects for analysis of conservation methodology
- digital information system for cultural heritage conservation
- 3D GIS for tracking and object location in museums and sites

These user scenarios will be validated by a panel of specialists in a meeting in Paris in the fall.

Through this meetings with CHEDI, a distinction has been made between user scenarios for public use by cultural heritage specialists (10 pages), and user scenarios for use within the expertise centres (30 pages, more detailed on budget, impact, success factors, etc. , see activity 2.8).

The material produced by the Ename Center will be made available in the knowledge base of the Network of Expertise (see activity 2.8). The proposals for scenarios will be analysed and assessed for feasibility of producing user scenarios in short and/or extended format.

The user scenarios will be finalised in period 4 and the short version will be published as one or more volumes for public use by CH professionals. The extended versions will become available in the Knowledge Base of the network of Expertise.

The guidelines to make these user scenarios will also be provided through the Knowledge Base, for further use within the expertise centres.

2.1.2 Deviations from plans and corrective actions

The partner University of Surrey will basically become unavailable for 2.1 as the head of the CeTR division moves to another university. This does not create major problems, a reallocation of the budget will be planned in period 4.

The partner KvNH ceased to exist in the beginning of 2007. Input has been secured from this partner, which will be processed in period 4 and turned into concrete scenarios.

The partner CHEDI has decreased in size but managed to subcontract its tasks within 2.1 to two specialists (Lon Addison and Mario Santana). Due to the time it took to come to this solution, part of the work will take place in period 4.

Due to changes external to the EPOCH project, all technically skilled persons have left the Ename Center. Discussions are ongoing to change their tasks accordingly in period 4.

2.2 Activity 2.5 Research Agenda

2.2.1 Starting point, progress and achievements against objectives

The focus of the 2.5 activity in period 3 was to provide, based upon the work in the previous periods, a formal Research Agenda. Major consultation was done of EPOCH and non-EPOCH experts, and a workshop at the VAST2006 conference in Cyprus in November brought together several of those experts to discuss in a multidisciplinary way the provided input. Also input from the workshop on Standards at the same conference, and several other symposia, focus groups, meetings, workshops and conferences (see deliverable) were taken into account.

This first volume of the Research Agenda uses 6 scenarios to highlight technological opportunities or developments that occur in the different domains of cultural heritage.

These scenarios identify further technical research in the domains of data capture, visualisation and presentation, mobile and networked systems, preservation, standards and interoperability. Additional ideas are proposed concerning the technology life cycle and take up of ICT in cultural heritage.

The second volume of the Research Agenda should have somewhat more focus on a multidisciplinary approach.

2.2.2 Deviations from plans and corrective actions

Seen the availability of the Research Agenda since February 2007 and the ongoing distribution and feedback collection of this document, it has been proposed to delay the update of the second volume of the Research Agenda with some months.

2.3 Activity 2.6 – Socio-economic impact

2.3.1 Starting point, progress and achievements against objectives

The focus of period 3 for the Socio-economic Impact activity was to refine the models and make them applicable.

Currently, two models are used. On one hand, the Holistic Impact Model, which gives a general impact model for investments, on the other hand the ICT Investment Impact Model which focuses on investments in technology.

These models are completed with a training model (the Heritage Impact Training Model) and a toolkit to use these models in practice.

Several case studies have been used to refine and test these models, especially the Royal Pavilion in Brighton was used as a “laboratory” case study. Other case studies such as the Roman Baths, the Maritime Museum or the Ename archaeological site provided impact studies on specific domains such as audio guides, internet or specific presentation technology. Case studies such as the Foundation of the Hellenic World and the Royal Pavilion used the Holistic model. The case study of the Big Pit on the other hand was used to identify Cultural Identity impact.

These developments have turned the models into practical methodologies and workflows that can be applied to concrete cases. For this purpose, a toolkit has been developed.

An extensive training programme has been designed where CH experts (UNESCO, city councils, ...) and the expertise centres will be trained through classroom training (in period 4) to use these models and tools in concrete cases. It will be investigated how to make maximum use of the training material, for example by creating e-learning material that can easily be distributed and reaches a wider audience than possible through classroom training. The training needs also to become available at different levels : an introductory course is planned for the Heritage Impact conference end of June 2007, classroom training as described above will be at the specialist level, while e-learning material probably will be situated at intermediate level.

In addition to that, other case studies will be used to demonstrate the potential and capabilities of the models, such as the British Museum, some city regeneration programme (to be chosen together with the European Association of Historic Towns and Regions), the Turin film museum and the Sagalassos archaeological site.

During period 3, attention has already been paid to social enterprises, by creating a heritage impact training model for this sector. This will be combined with the work on this enterprise form in 2.7 and 2.8 (see below).

Dissemination of the work has taken place through a paper at the VAST2006 conference and a chapter in the EPOCH State of the Union 2006, through two volumes in the Heritage Management series, through several presentations at conferences (EAHTR, IST, ...) and through the yearly Heritage Impact conference, that is organised by the University of Brighton.

2.3.2 Deviations from plans and corrective actions

Both the Turin and British Museum case studies have suffered from a delay in data acquisition and are planned to have been finished by December 2007.

The partner University of Surrey will basically become unavailable for the 2.6 team as the head of the CeTR division moves to another university. This does not create major problems, a reallocation of the budget will be planned.

2.4 Activity 2.7 – Brokerage

2.4.1 Starting point, progress and achievements against objectives

The key focus of brokerage in period 3 is the integration into the Network of Expertise. Several approaches have been taken.

First of all, brokerage has focussed strongly on the creation of new teams around a certain theme, that is in full change and development. Three themes have been addressed already : Location Based Systems, Archaeological Information Systems and Games Technology in Cultural Heritage. This functionality should be taken up by the expertise centres who can help in this way to develop or strengthen certain domains by such pro-active measures, that can take place on an international

level, hence being an activity organised by multiple expertise centres or even the central coordination organisation (see below).

For Location Based Systems (LBS), a team of experts has been brought together around an international workshop (Brussels, Nov 21, 2006), which will yield an EPOCH publication on the new developments in this field. At the same time, a team of stakeholders was brought together to define the use of LBS in Flanders and link it to starting initiatives, initiated by the Ministry of Heritage and IBBT (Institute for Broadband Technology, a Flemish research funding body).

For Archaeological Information Systems (AIS), a group of experts was brought together in a technical exchange meeting at the Flemish Heritage Institute on March 22, 2007. This team will prepare a workshop, most probable at VAST2007, where the technical, organisational and exchange issues of AIS will be discussed. This group will also further exist as an operational team (supported by EPOCH) and we expect concrete cooperations to emerge from it.

The use of Games Technology in Cultural Heritage is another domain where significant changes are taking place. Building on the results and contacts of the panel discussion about the same topic at VSMM2005, a group of experts will be brought together in the summer of 2007 to prepare a workshop at VAST2007, in cooperation with the Serious Games Alliance, the Intuition NoE and Playing the Past, a social enterprise (see below) that focuses on this topic.

This creation of new teams has proved to yield significant visibility and outreach for EPOCH, enabled several EPOCH partners to participate in a new activity and make their know-how available, and created links with many non-EPOCH partners. It will become an important pro-active activity of the expertise centres to help develop and shape new emerging domains.

A second focus of brokerage was the creation of business and technology transfer models for the Network of Expertise, to solve the problem of the insufficient take-up of developments in CH+ICT from universities and research centres. One of the transfer models is the “Service Based Development”, which is basically a close cooperation between specialised SMEs and a spin-off or new company, taking up a certain technology developed at a university or research centre. As most of these technologies are not in a “product” form yet, hence lack certain required functionalities, most such start-up companies face an extra development cycle which still yields little or no income. Overcoming this period is even much more difficult if CH is the target market, as this market is slow and difficult with little budgets. This can be overcome if a small group of SMEs uses the technology to provide services during a few years (i.e. using the new technology to produce results, not to sell it as a product), yielding a detailed insight in the market requirements and giving the start-up company in the meantime the opportunity to turn the new technology into a product.

Another business model that has been evaluated is the concept of social enterprises in CH. This business model is very useful in CH because it allows organisations to work in a different way than normal enterprises, as many CH projects are commissioned by public authorities that are allowed to work directly (without tendering) with non profit organisations but not with normal enterprises.

A concrete case of a social enterprise (Playing the Past), active in games technology for CH, has been followed and analysed. Being a non profit company is part of their business model as it allows them to circumvent the high costs of game engine licensing.

A third activity of brokerage is the efficient use of equipment, where a start has been made to plan concrete tests with EPOCH technology (the AR telescope of Fraunhofer and the digitalisation dome of KULeuven). The tests will take place in period 4, and will be useful also as demonstration projects, which is one of the envisioned activities of the Network of Expertise.

A fourth activity database, that also lays an important foundation for the Network of Expertise is the creation of an extensive and up to date database of CH organisations, SMEs and experts, including the EPOCH partners, but also many other European and worldwide organisations. This database is online in the Network of Expertise part of the website.

2.4.2 Deviations from plans and corrective actions

A planned activity that has had too little attention is the data repositories. Basically there are two types of data. On one hand there is data and software that can be useful for research (to test algorithms for example, or to do further development and experimentation), on the other hand there is data and software that can be useful in the context of the Expertise Centres (for example to demonstrate new interpretation methods such as interactive storytelling). Both classes of data have their own requirements (for example, software should go with a training if used in the expertise centre context). In period 4, more effort will be devoted to this.

This brokerage activity has only a small budget which does not allow major activities to be undertaken. Although this activity will have a major role in the Network of Expertise, the limited budget allows the current activity only to prepare and test it.

2.5 Activity 2.8 – SME support

2.5.1 Starting point, progress and achievements against objectives

Activity 2.8 develops and deploys a strategy to encourage the development of a Network of Expertise linked to local learning groups (clusters) of companies, CH organisations, creative industries and research organisations to provide mutual support, increase understanding of the sector, identify opportunities for development and collaboration and define a program of education and training in support of the development and improvement of the CH+ICT sector.

The key objective of the cluster development programme is to provide an opportunity for companies and CH organisations to:

- reflect on their current and potential position
- discuss new technological developments and their utility in the CH domain
- build an understanding of public and private institutions business models
- learn about current CH policies and guidelines
- contribute to the delivery of CH policies and protocols

This activity has seen in Period 3 a substantial move towards an operational Network of Expertise, with close cooperation of most of the members of the current group of potential expertise centres. This has resulted in several concrete actions.

First of all, an overview has been made of the of the envisioned activities and capabilities of an expertise centre. Most members of the group have made business plans that has demonstrated if they were capable to take up these activities. In the mean time, evaluation of each member has taken place. This has resulted in the selection of the following centres :

- Forum Trust, Norwich, UK
- Limburg Museum, Venlo, Netherlands
- Interactive Institute, Stockholm, Sweden
- CAAI, Jaén, Spain
- ICC, Krakow, Poland
- MiraLab, Geneva, Switzerland
- PIN, Prato, Italy

For these centres, facilitator trainings have been organised, so that they are capable to start a local cluster. The goal of these trainings was not only to provide the appropriate skills to select, start and

facilitate such a group, but also to provide a more or less standardised way of organising the meetings and the action learning. The Forum Trust had started already in February 2006. Two other centres have started such a local group, and are successfully organising meetings and training (Limburg Museum in January 2007, Interactive Institute in October 2006, but officially opened on April 2007).

The Forum Trust, the Limburg Museum and the Interactive Institute use the normal learning network approach, as provided in the training.

As there are not many companies active in Cultural Heritage in Scandinavia, the Interactive Institute in addition employed an incubator model. This incubator is a flexible and creative workspace for existing SMEs with integrated services such as training, professional assistance and cooperation support. Cultural Heritage projects are initiated from by the incubator or external bodies.

The other expertise centres are also preparing the start of their local cluster. The CAAI will start its group in September 2007 (which was prepared through a regional meeting in January 2007 where Cultural Heritage institutions and companies from Andalusia were present).

A further expansion of the group has been prepared extensively through many contacts and meetings. In this way, extra groups in Flanders, Wallonia, Germany, Spain, Hungary, France and Greece are being contacted or have expressed their interest. They will be formally assessed and have to make a business plan.

The model of the Network of Expertise has been enriched and extra activities at the network level, such as technology and knowledge transfer, training and brokerage have been defined in detail. It is envisaged that these activities will be organised in the future by a central network coordination organisation, called Her-IT-age.net, for which its structure and operations are being discussed. The key objective here is to maximise the sustainability and flexibility of this organisation. In other words, this organisation will need funding to establish its operations in the first years but will need to become (close to) self supporting in the longer term. This organisation is also designed in such a way that the Network of Expertise can organically grow and mature.

For the purpose of knowledge transfer, research providers have been identified who will input know-how in the form of training modules on different levels of specialisation. In cooperation with brokerage, scenarios have been developed to establish a successful technology transfer between these research providers and SMEs. These scenarios will be tested on two technologies mentioned above that are provided within the EPOCH Common Infrastructure.

The expanded group has been invited to a international workshop on the concept of a Network of Expertise, hosted by the Limburg Museum in Venlo, Netherlands, with participation of the regional and national authorities. The proposed structure of the Network of Expertise and its functionalities were discussed amongst this group. A major focus point was the sustainability of the proposed structure.

The expertise centres form themselves also a learning group on European level. This group facilitated its members in generating project ideas and methods for integrating stakeholders and technology and in know-how around the Cultural Heritage / Information and Communication Technology (CH+ICT) interface. In addition it has led to collaboration between members as competences and assets are rendered explicit by the learning process. A voluntary audit has identified at least 6 collaborations between partners of the learning group since its inception. These collaborations have taken the form of EU project proposals, creating training modules, and participating in exhibitions. Skills and knowledge transfer have shown encouraging results. Benefits to members include improving knowledge about the CH+ICT interface as well as enabling strategic thinking and encouraging organisational changes. The substantive sessions on strategy proved valuable in terms of providing members with the skills to develop strategy plans, present, test and critique ideas, and also introduce organisational changes in their institutions.

This group has taken on the next phase of the development of a Network of Expertise which is virtualisation. It was the first time that a learning network has been taken internationally. Although this worked out very well, the downside to it was the cost to run this network was quite high. Once the trust has been built up between the group members, the frequency of the meetings became much lower and interactions took place through the Internet. For this purpose, a file manager, calendar, wiki, address book and a forum on 13 different activities within the network were provided. A knowledge bank is being designed and built, based on wiki technology, to contain the key knowledge of the CH+ICT domain, including an extensive list of experts.

A lot of effort was also put on capability mapping of CH+ICT organisations in Europe, and especially in the countries where we have already an operational expertise centre, where we tried to come to a country profile.

One of the key elements of the Network of Expertise is training. Two technical training sessions at intermediate level were organised at the VAST 2006 conference in Cyprus. Other training modules (such as the socio-economic impact modelling) will be designed in period 4.

Also a paper at CAA007, explaining in detail the Network of Expertise model has been approved and presented.

2.5.2 Deviations from plans and corrective actions

There are no major deviations from the plan. A few minor and future issues appear.

Currently the core group is very busy in organising the Network of Expertise and its different activities and putting content in the knowledge base. Very little time is left for taking up the tasks that normally reside in the central coordination organisation. This means that it is not possible within the current context to come to a fully operational Network of Expertise. This will only be possible if sufficient staff will become available, hopefully under future projects. No corrective action is needed as this activity only has the ambition to define, prepare and test a Network of Expertise.

More emphasis will need to be put on the virtualisation of the interaction between the members of the group. For this, more focus needs to be put on the content of the knowledge base and the use of this content.

The partner University of Surrey will basically become unavailable for the 2.8 team as the head of the CeTR division moves to another university. This does not create major problems, a reallocation of the budget will be planned.

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 1. May. 2006 - 30. April 2007. :

3.1 – Coordination of Research Activities

3.2 – Development of New Tools

3.3 – Common Infrastructure

List of deliverables

D3.6: Common Infrastructure - Document with guidelines how to make IT tools EPOCH compatible (month 37) was delivered in Month 39

List of milestones

M3.6 VAST06: 6th WP3 Concertation Meeting (+/- month 31) *achieved*

M3.10 First pipeline consisting of multiple CI modules demonstrated (month 26) *achieved*

M3.11 Final decisions on formats in the 4 areas Multi-media / 3D / Semantic contents / Containers (month 31) *achieved*

(decision of the use of KML vs GML for geographic data is still outstanding, but is not a key issue)

3.1 Activity 3.1 Coordinate research activities

3.1.1 Objectives and starting point

Objectives

1. Organising regular consultation with Sector Watch (Activity 2.1) and Research Agenda (Activity 2.5) 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 reporting period, agreement had been reached on the Cultural Heritage Data Objects approach, propounded by WP3 coordinator Leuven. This approach envisaged the selection of existing standards for 1) 3D data, 2) non-3D multimedia, and 3) semantic information and metadata, and to bind information together through a container format, to be selected still. This period also started with the different NEWTONs still in their early phase.

3.1.2 Progress and achievements

At the end of this period, standard selections can be considered fixed for all the aforementioned areas. Also the Cultural Heritage Data Object (CHDO) formats have been selected. In line with the general policy of the Network, existing standards were adopted wherever possible.

Both the Common Infrastructure and the NEWTON projects have advanced well.

WP3 coordinator Leuven (Sagalassos Division) has undertaken the following activities, helped by the other WP3 partners:

1. Organisation of several WP3 meetings, to define the principles governing the EPOCH Common Infrastructure and NEWTON projects, as well as the more detailed architecture and implementation thereof. After the CHDO approach was discussed with and was approved by the partners at the EVA conference in Firenze, 5th April 2006, work on the standards continued and was finalised in two further meetings, one at the joint VAST-CIPA-Eurographics conference in Cyprus (30 Oct – 4 Nov 2006), and the second at the CAA conference in Berlin (2-6 Apr 2007).
2. In collaboration with WP4, 4 WIKIs and mailing lists had been set up and were maintained to coordinate the discussion on the standards / formats for (1) 3D data, (2) non-3D multimedia, (3) meta-data, and (4) containers. The coordinators for these still were (1) Sven Havemann (Un. Graz), (2) Bert Deknuydt (KULeuven), (3) Franco Nicolucci (PIN-Firenze), and (4) Luc Van Eycken (KULeuven). Apart from the METS-Fedora choice (next item and deliverable D3.6), the main novelty has been the discussion on compression standards for 3D meshes (see D3.6).
3. A document was composed to summarise the current state of container formats (Bert Deknuydt and Luc Van Eycken). This document was intended to jumpstart the discussions on the container formats. The conclusions were that METS and Fedora were good candidates, which met approval from the other partners. Leuven has then moved on to carry out practical tests and to get hands-on experience. Fedora web server and tools were set up and fed with test data from Pompeii. The purpose was to test as many and as diverse as possible data/metadata. Also the import/export to and from the METS containers was tested.
4. KULeuven has organized two meetings in order to prepare the decisions on 3D formats/standards and the CHDO issues: the first in Zurich on 18 Aug 2006 (with an additional focus on the avatar work), and a second in Leuven on 9-10 Jan 2007.
5. Leuven has refined – with help from the different partners involved – the two Tool Chain descriptions. The Tool Chains are intended to show the interoperability of the tools developed under WP3. Initially, there had been plans for 3 Tool Chains, but only two were kept: the Virtual Visitor Center and Archaeological Field Survey.
6. Deliverable D3.6 has been produced and describes the progress made on the Common Infrastructure and the NEWTONs, gives the arguments for the METS-Fedora choice as well as the final selection of Collada-OpenSG in the area of WP3, and describes our thinking on compression standards for 3D meshes. The document also describes the early stages of the Tool Chain construction.

7. Together with the Interactive Institute (Halina Gottlieb, Stockholm), WP3 coordination prepared for a series of demonstrators at the Interactive Salon, where the general public was able to see and experience part of the EPOCH tools. More importantly, this event served 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. The first Interactive Salon was organised in Stockholm. The Salon is now being set up at the Museum of Fine Arts in Budapest, and is planned to travel on to Norwich after that. The plan is to continuously update the EPOCH demonstrators at the Salon.
8. The Leuven WP3 coordination team helped to organise courses. Tijl Vereenooghe (KULeuven) e.g. demonstrated the 3D webservice tool at a special EPOCH session at CAA06 in Fargo, Maarten Vergauwen (KULeuven) presented the same tool and MeshLab at VAST06 in Cyprus, where Pascal Mueller (ETHZ) did the same for the CityEngine. These courses were mainly aimed at the members of our Network of Expertise Centers, and had been initiated by an overview of CI tools which Luc Van Gool gave to the NoEC representatives at the EVA06 meeting. These activities were held in collaboration WP2.
9. 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 2006), adjacent to the European Conf. on Computer Vision 2006 in Graz. This workshop was co-organised by Leuven. This initiative was timely, as Agamemnon was nearing its end.
10. The special issue of Machine Vision Applications on the use of 3D acquisition technology in Cultural Heritage has appeared (Vol. 17/6 – editors Luc Van Gool, KULeuven, and Robert Sablatnig, TUWien). A further special issue is planned on the use of pattern recognition for Cultural Heritage, by the same editors, for the Int. J. on Pattern Recognition and Artificial Intelligence. Last but certainly not least, a new Journal has been accepted by ACM, with David Arnold (Un. Brighton) as editor-in-chief and several EPOCH members as Associated Editors: the Journal on Computing and Cultural Heritage.
11. The University of Brighton has been coordinating efforts to address longer-term requirements for 3D digitisation bringing together the expertise from WP3 to contribute to the EPOCH research agenda which partners will use to assist in formulation of future bids
12. In terms of initiatives towards other, related projects and organisations, a number of events are noteworthy. The advancement of the AMA tool has been presented by PIN-Firenze and AMA partners as part of more general EPOCH presentations at several occasions, most notably at the VAST workshop on Interoperability (3 Nov 2006) and at the DELOS-MultiMatch workshop on “Ontology-driven Interoperability”, in Pisa, on 15 Feb 2007. EPOCH was represented with a 4-person strong delegation at the European Digital Library meeting in Vienna on 31 Jan – 1 Feb 2007 (Un. Brighton and KULeuven). At VAST06 in Cyprus, a joint meeting with CIPA and RecorDim was held, to discuss standardisation issues in the field of Cultural Heritage.
13. Finally, several WP3 partners have contributed sections to the updated Research Agenda.

3.1.3 Deviations and corrective actions

As to the late start of the NEWTON project Upgrade, as reported in the last PAR, this situation has been resolved and the Upgrade project is now well on track (see WP3.2).

3.2 Activity 3.2 Development of New Tools

3.2.1 Objectives and starting point

Objectives

Objectives in JPA3:

1. To follow-up the NEWTON projects
2. To ensure the successful integration of their results into the Common Infrastructure

Starting point

After the 19-20 Dec 2005 NEWTON and WP3 management meeting, the NEWTONs were ready to start at 1 Jan 2006 (except for Upgrade). By now all projects are at cruising speed, or have ended already.

3.2.2 Progress and achievements

Deliverable D3.4 described the goals of the different NEWTON projects, and deliverable D3.5 gave a description of progress made during the last period, which was rather limited as the NEWTONs were only starting up. Deliverable D3.6 contains a description of progress during this reporting phase. Here we only give a short summary.

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 the last period, integration with the 3D patch registration and decimation software of CNR-Pisa (MeshLab) was finalised. The latter software has also been released in isolation, under GPL open source license. By now, version 1.0 has been made available, mainly with improved hole filling.

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 have already integrated their technologies under a specialized node of this architecture. As to the BTF (Bidirectional Texture Function) provided by Un. Bonn, this image-based rendering work has been extended to support highly realistic, real-time rendering. ISTI-CNR has provided state-of-the-art technologies for the interactive visualization of massive triangulated models using out of core multi-resolution structures. TU-Graz, has integrated the scripting/modeling language, the Generative Modeling Language (GML), into OpenGL. Moreover, Un. Graz has built an environment to easily assemble 3D scenes, where the parts can come from different EPOCH 3D acquisition tools, and have also created intuitive devices to interact with these models.

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

A new release of the AMA-tool (0.9) has been implemented for the conversion of XSD schema to a CIDOC-CRM compliant format. Also an XLST-file for the mapping from XML data to XML CIDOC-CRM mapped data has been released; this file is the interface with the MAD application (managing, retrieving, etc).

The tool has been tested extensively and the specification of the AMA-text-tool has been started. Work continued on the harmonization of the CIDOC-CRM and the TEI (Text Encoding Initiative). The template concerning the excavation of AKSUM (Ethiopia) has been delivered to Steve Stead at Pavprime Ltd for further evaluation.

MAD (Managing Archaeological Data) has been extended by adding a semantic framework to provide a full implementation of the CIDOC-CRM data model and a full support for the most important W3C standard languages developed for the semantic web (RDF/OWL).

A complete set of semantic query features has been developed by integrating Sesame, a set of java libraries to manage RDF data stored in a repository, to evaluate SPARQL and RQL queries against RDF datasets and to present results in a different way.

The ability to query RDF dataset stored remotely is guaranteed to our application by Joseki, a web interface for the Jena framework useful to evaluate SPARQL queries on any online RDF/OWL set of documents simply by giving the document URL as a parameter to the query.

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. CIMAD has come to a close now, but follow-on actions will be taken under the Common Infrastructure.

Main achievements:

- Specification of the context model for CIMAD
- Specification of the rule-based customization model for CIMAD
- Preliminary design of context-based story telling system as CIMAD case study

Setup of a demo called “Smart Museums, Sites and Landscapes - From Visitor Guides to Collection Monitoring”, in cooperation with UNIKENT, during “Interactive salon - New Technology for Visitors in Cultural Heritage” held at StadsMuseum (Stockholm) until March 2007. The prototype is based on a stereovision system and has the goal of gathering museum statistics as well as supporting visitors with mobile guides. It is integrated within MobiComp, the CI Context Management Framework.

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

Laser scanners provide high geometrical detail, but lack the ability to detect important features, notably edges. Hence, edges measured from the oriented images, and point cloud data from laser scanning have been integrated in order to benefit from the advantages of both sensor systems.

During the reporting period, the following results have been achieved in particular. The implementation of the outlier detection algorithm into the software system was finished and tested on various datasets. Due to the legal problems concerning the data distribution of the Panaghia Kera Basilika (Crete), as reported at the Cyprus meeting, we acquired new datasets of an object in

Zurich, the ETH Sternwarte. Laser scanning was conducted using a FARO Laser scanner, photogrammetric images were acquired with a calibrated digital camera. A first 3D-model of the Sternwarte was already generated from the acquired laser scan data, during the next months we will process the photogrammetric images and then combine both datasets in order to achieve a highly accurate textured 3D-model of the building. The development of the processing software, which will be used for the combination of datasets actually, is focused on the optimal detection and modeling of 3D edges based on images, where different algorithms are currently being evaluated.

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 pre-release was made available to UEA at an early stage, so that UEA could already design their modules in a manner compatible to the VHD++ framework. EPFL have set up a VHD++ kernel repository with both source code and documentation to help users in developing their own components within the VHD++ platform. VRlab is now working on accelerating the maths library and documenting the code. UEA have updated the showcase demo with new independent navigation, interesting-building-identification, quick go-to-interesting-building, internal url viewing (for seeing, e.g. a webpage associated with a building), etc. The initial, slow OpenSG rendering of avatars have been replaced with direct OpenGL calls (using UEAs ARP rendering dll). 100's of instances are by now possible with no OpenSG memory/speed overheads. The 'Final' showcase & scene assembler applications have been sent to Brighton for usability/testing. The showcase project + code were sent to Volker Settgast (Un. Graz) and Simon Haegler (ETHZ) for the inclusion of the avatars in a demo they are producing for Tool Chain 1.

6) **UPGRADE**: Underwater PhotoGRAMmetry and Archaeological Data Enhancement

The main goal of the project is to develop a set of software tools, together with a set of best practice recommendations, to integrate and fuse acoustic, optical and platform navigation data for the exploration and mapping of underwater archaeological sites. In particular, the software tools will aim to make the data fusion process largely automatic, in order to facilitate the construction of integrated, geo-referenced, large-to-medium 3-D scale maps of underwater archaeological areas from optical and acoustic data. Because this is the first report for this NEWTON, this report is a bit more extensive and lists the work done by each partner:

LSIS/CNRS

worked in close collaboration with ISME and SIMVIS in order to automatically produce a 3D document relating surveys made by the ROV that is property of ISME. Connected to this effort is software and a protocol by ISME to link navigation data with the photographs taken by their ROV (made by a digital camera or a video after extraction of the frames).

LSIS/CNRS also used the exif information in the photographs to build photogrammetric models, based on their own software and on Photomodeler (Realviz product). An XML format was defined to describe navigation data and camera parameters.

LSIS/CNRS has also developed a tool to automatically generate a 3D VRML script to show the camera position and the projection of the photograph onto an approximation of the seabed, in order to check visually the validity of a survey on the site.

IST

The work at IST has focused on: i) assessment of the problems when integrating different types of equipment on a marine platform, ii) preparation of a detailed list of the equipment to be used for archaeological missions involving marine robots; and iii) definition of key rules for equipment integration. At the same time, work has progressed on algorithms for underwater platform navigation and positioning.

ISME

Preparing routines for constructing EXIF/XML files from raw data (ROV's navigation data and images of the sea bottom). This software was tested and led to the production of sample EXIF/XML files from data collected in previous missions.

SIMVIS

worked with LSIS/CNRS on photo and navigation tools and investigated techniques for the realistic immersive visualization of underwater sites using state of the art computer graphics facilities, to simulate a realistic dive down to an underwater wreck. Photographs are being used to obtain realistic and accurate seabed visualization and navigation data (position orientation and timestamp) to simulate the ROV navigation.

UIBK

worked in close collaboration with LSIS/CNRS and ISME on best practices for underwater camera calibration using simple photogrammetric software packages and processing of simulative and field data.

3.2.3 Deviations and corrective actions

All NEWTONs have been active during this past period and will come to an end in the next period. They have made major progress and results have been shown among others at conferences like VAST and CAA. The outcome of the research projects has been in line with the project plans. Problems with getting Upgrade starting up have been resolved and the project is performing well. No further deviations and no corrective actions required.

3.3 Activity 3.3 Common Infrastructure

3.3.1 Objectives and starting point

Objectives

Objectives in JPA3:

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

For each a more detailed description is available in the document on priorities for the initial Research Agenda. During JPA3 an updated Research Agenda has been drafted, with input from different constituencies. This document helps to further refine the goals, only some of which can actually be achieved within the lifetime of the project.

3.3.2 Progress and achievements

During this period the selection of standards has been further solidified. In particular, the final selection of multimedia standards has been decided on, as has the form the Cultural Heritage Data Objects should take on (container formats). Of course, also the development of the envisaged Common Infrastructure tools has been carried on. Next follows a short overview of implementation work in this period, which typically is a continuation of work started under the previous period, and this per technical subarea (again, more detail is given in D3.6).

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

Work in multilingual systems at Un. Brighton has revolved around improving Information Retrieval methods for cultural heritage as well as implementing partially those results in a Question-Answering system. In particular, we have focused on building a Natural Language interface and exploring new ways of extracting and querying cultural heritage textual digital resources linked by a common ontological representation (CIDOC-CRM) and a suitable query language (SPARQL, in collaboration with PIN, Italy). The extraction phase exploits the propositional nature of the ontology, while the query interface is based on the Generate and Select principle, where potentially suitable queries are generated to match the user input, only for the most semantically similar candidate to be selected. At the moment, the system is split into two functional entities, extraction and querying and makes use of the WORDNET lexical resources.

2) **Databases and knowledge management**

The last year's development activity focused on the creation of additional functions for the MAD (Managing Archaeological Data) tool in order to make it more flexible and suitable for the new semantic web scenarios. Several technologies were tested and evaluated to create these new features and to empower the already existing ones.

MAD was originally designed as a web-based tool to manage and query XML-based archaeological datasets encoded using the CIDOC-CRM ontology through a complete set of web interfaces built using W3C standards. The main advantage of the native approach resides in the portability and long term preservation of the XML archaeological data, since the advanced features of MAD make them simple to share and reuse in different contexts.

MAD has been extended to SAD, with the integration of semantics. The main goal of the SAD extension developed in the last period was the creation of a complete framework to fully support RDF, a language conceived as a base for the automatic "understanding" process and for retrieving information from RDF graphs. The RDF language is used to implement the CIDOC-CRM describing the explicit and implicit concepts and relations underlying the documentation structure.

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

MobiComp is the Kent Context Management Infrastructure adopted by, and further developed as part of the CI. All Context information, needed to implement the services, is exchanged through MobiComp. The architecture is distributed and allows for the development of stand-alone and client/server systems. It relies on the concepts of a shared tuplespace (the so-called ContextServer), accessed by a remote ContextService, running on each remote client, managing components needed to process and utilize context information.

As a contribution to the Common Infrastructure, the University of Bologna and the University of Kent collaborated on the creation of various MobiComp clients. MobiComp clients are systems that are able to detect and provide (trackers), aggregate (aggregators), or use (listeners) context information, i.e. information about the situation or environment of a device, object or person. MobiComp provides interfaces allowing sensors to deliver, and other components to refine and/or consume context data provided by the infrastructure in a common format (Context Elements). They communicate with the local ContextService on the MobiComp client, acting as a mediator with the remote ContextServer that stores the public Context Elements of all MobiComp clients.

MobiComp clients were tested in the field at the Interactive Salon in Stockholm, where we set up a demonstration named "Smart Museums, Sites and Landscapes – From Visitor Guides to Collection Monitoring".

4) **Recording and data representation aspects**

Three tools for recording and data representations were further developed.

A first new recording tool is a portable dome, developed by KULeuven, to scan small objects in situ. An overhead camera observes the object and images are taken under different illumination, coming from 164 power LEDs, spread evenly over a hemisphere. The result is a very realistic image-based rendering of the object, but also an approximation of the 3D geometry. The dome is about to be tested at Cornell University, for making available cuneiform tablets over the internet.

The 3D-WebService, which turns uploaded images into 3D models, was enhanced to run on a PC cluster with more than 800 machines, at KULeuven. It was also integrated further with the MeshLab software (CNR-Pisa). The depth maps are now shown through the MeshLab interface.

MeshLab itself has seen three major public releases (versions 0.8, 0.9 and 1.0). The MeshLab package has been downloaded more than 8000 times in this period. With the latest release the MeshLab system can act as an integration tool for the management of 3d data among the various EPOCH partners, allowing conversion, simplification and cleaning of 3D objects.

The CityEngine (ETHZ) for the efficient and effective 3D modelling of architectural environments was developed further, with possibilities to combine buildings, street patterns, and vegetation distributions. Some further test cases testified to the flexibility of this tool.

5) **Visualisation and rendering**

The University of Graz, with contributions by the University of Brighton, have worked on a framework for the visualization of EPOCH 3D content. A central part is the rendering platform, called the EPOCH Viewer, which is based on OpenSG. The scene graph can be augmented with non-3D information using the <extra> XML nodes. Furthermore the scripting language GML is integrated into it to allow efficient encoding of parametric families of 3D shapes.

A larger-scale integration has been successfully concluded, that involves several partners. ETH Zurich's CityEngine viewer is based on the OpenSG 3D engine and this partner is currently investigating 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 have been 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, and (4) BTF visualization from partner Bonn (see 3DKiosk Newton). A Collada importer/exporter for OpenSG, which is also capable of robustly reading/writing XML annotations, is still under development, but the first results are already available.

6) **Multi-modal interfaces**

In the Interactive Salon exhibition the visitors can interact with many of the EPOCH results and tools. Additionally usability tests were performed at Brighton. Special attention has been paid to the multi-model aspects. Another device described in this section is the augmented reality telescope.

The Interactive Salon is an EPOCH initiative, initiated and coordinated by partner TII (Interactive Institute), to showcase technology and its use in a cultural heritage context. The first edition of the Interactive Salon opened at Stockholm City Museum on October 17 2006, and has already been announced in the previous report. In particular, beyond its clear dissemination value for the project, the exhibition serves as a laboratory to investigate new technologies and concepts can enhance communication with visitors in the context of cultural heritage. The Salon presents prototypes and products developed by different European research institutes, universities and museums. Countries represented at the first edition were Sweden, England, Italy, Belgium and Egypt. Next, the Interactive Salon will go to Budapest and Norwich.

The augmented reality telescope xc-01, designed and built by the IGD-Fraunhofer in Darmstadt, is a new kind of telescope where virtual objects are superimposed on the real view. It is as easy to use as a common telescope. Furthermore it allows the projection of contextual information on the viewer's field of vision. The vandalism-proof case of the xc-01 contains a high-resolution camera, a high-contrast LCD-display, a precise hardware tracking system, an air-conditioning for outdoor use and a coin detector. Two types of optics were designed for the first prototype during the last year. The design of the telescope has also been reviewed and made more attractive.

7) Virtual humans and other avatar technologies

The research in this subarea covers the different aspects of the vhdPLUS Development framework. It is a modern, fully component oriented simulation engine and software middleware solution created by and reflecting many years of R&D experience of both the MIRALab, University of Geneva and VRlab, EPFL labs in the domain of VR/AR and virtual character simulation.

VhdPLUS is a highly flexible and extendible real-time framework supporting component based development of interactive audio-visual simulation applications in the domain of VR/AR with particular focus on virtual character simulation technologies. It relies heavily on multiple, well established OO design patterns, uses C++ as the implementation language and Python as a scripting language. The goal for the Common Infrastructure was to deliver tools to help partners to use vhdPLUS for the integration of UEA, EPFL and UNIGE virtual human technology (Characterise NEWTON). VhdPLUS has been made available through Sourceforge in a source format, and has been released under the LGPL license. Several vhdPLUS tools are available on the vhdPLUS repository. See D3.6 for a more detailed description of these tools.

3.3.3 Deviations and corrective actions

There are no major deviations to be reported, except for the multi-lingual domain, where the effect of IBM dropping out of the process at the very start of the project is still being felt. On the other hand, contacts with C2RMF suggest that problems in this area are not that acute, at least not for the major European museums. Therefore, in JPA3 emphasis has been shifted from the multi-lingual towards the intelligent querying aspect. This activity is now well underway, at Un. Brighton.

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 1 May 2006 - 30 April 2007:

4.1 – Web site

4.2 – Standards

4.7 – Human resources development and events

4.8 - Publications

List of deliverables

D.4.11. State-of-the-Union for IST in CH (SOTU), due Month 37 (due date 29 May 2007). The deliverable was delivered on time. It consists of the preliminary version of the full book, extending the previous report prepared in 2006.

D.4.12 Report on spreading excellence, due Month 37 (due date 29 May 2007). The deliverable was delivered on time. It consists of a summary report of the activity in year 3, plus an introduction describing the dissemination policy, its goals and overall achievements with an overview of 3 years' dissemination activity.

4.1 Activity 4.1 Web site

4.1.1 Objectives and starting point

Objectives

1. Maintenance of the web site, including start-up of the new EPOCH.eu domain.
2. Improvement of existing services and implementation of new ones.
3. Update of the on-line services and electronic vote service.
4. On-line availability of EPOCH publications or links to relevant papers

Starting point

At the beginning of the period, the project had already updated the web site design and successfully maintained the web services.

4.1.2 Progress and achievements

Management and maintenance of the web site has continued in the period with no substantial problems or interruptions.

The domain EPOCH.eu has become operational in July 2006 so that the web site can now be accessed through EPOCH-net.org and EPOCH.eu.

New web services

A new 3-stage election poll to propose and vote for a new member for the EPOCH Executive Committee has been implemented. The application provides partners with automatic functionalities to submit candidatures and to calculate the one with the highest number of votes in order to create a ranking through the 3 stages and to calculate the winner.

A new service for the creation of online surveys to build online databases of collected answers has been created and installed. The tool can be used both to insert new information and to update existing information. The application was used by WP 2.8 partners to build a database of European institutions that are active in cultural heritage and ICT. The questionnaire has been accessed more than 2200 times since it was up and running (February 2007).

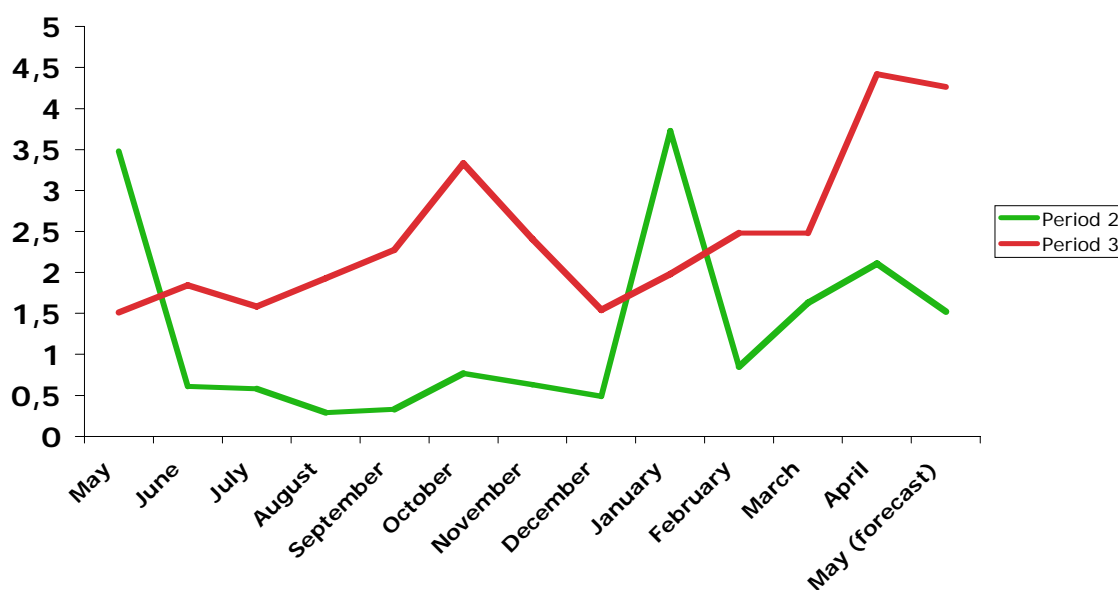
Web site statistics

Detailed and continuously updated use statistics are accessible from the home page. They provide daily access data and monthly details.

Visitors come in predominantly from EU countries (significantly, Germany is the first although there are no EPOCH partners there), but international access from developed countries is also visible, e.g. Mexico with about 570 MB downloads, Australia with 360 MB, Japan and India each with 300 MB, Brazil with 290 MB, Taiwan with 50 MB, down to 15 MB for each of Ghana, Vietnam and Trinidad & Tobago. USA access is difficult to determine and possibly is mixed in the “unknown” category or the .com/.net ones, accounting for 3600 Mb in total.

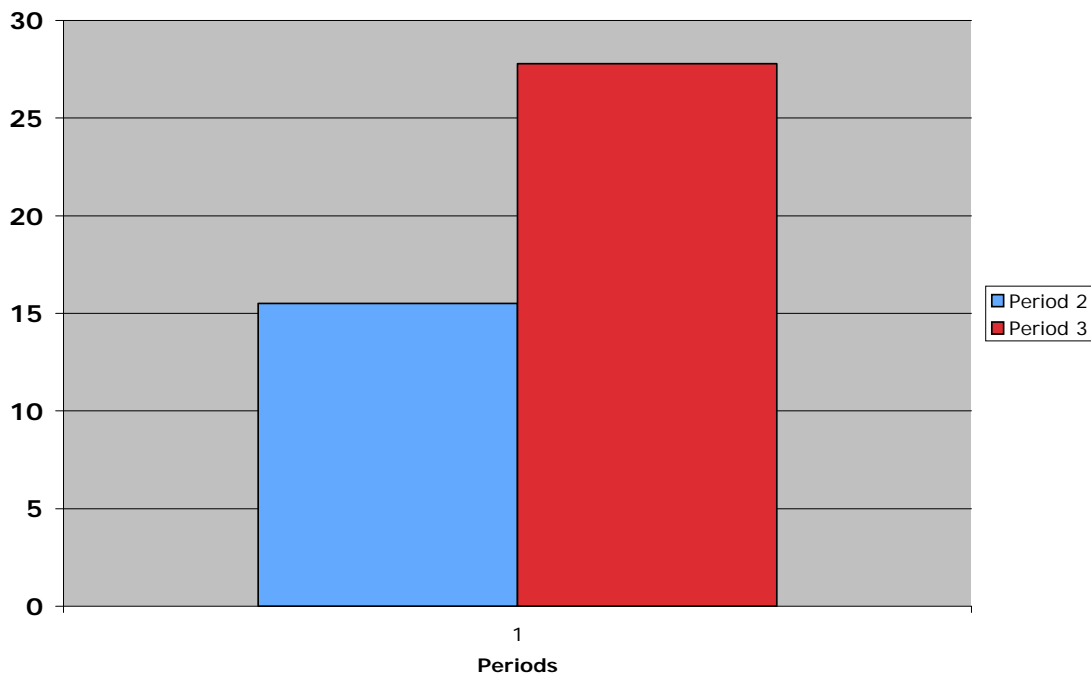
As usual, most visits are short, but 30% of visits are long enough to allow for the reading of page content. The best seller page is the calendar one – a service which is evidently appreciated by users – accessed more than 5000 times during the last year, followed by the download page of the Research Agenda that now averages 200 downloads/month, followed by the SOTU report with some 80/month. Other publications follow with some 20 downloads/month, with some 2004 publications still requested by users. The total monthly volume of such downloads (referring to May 2007) is about 2,25 Gb. The yearly trends are represented in the diagrams below.

EPOCH web site: monthly transfers (incl. downloads)

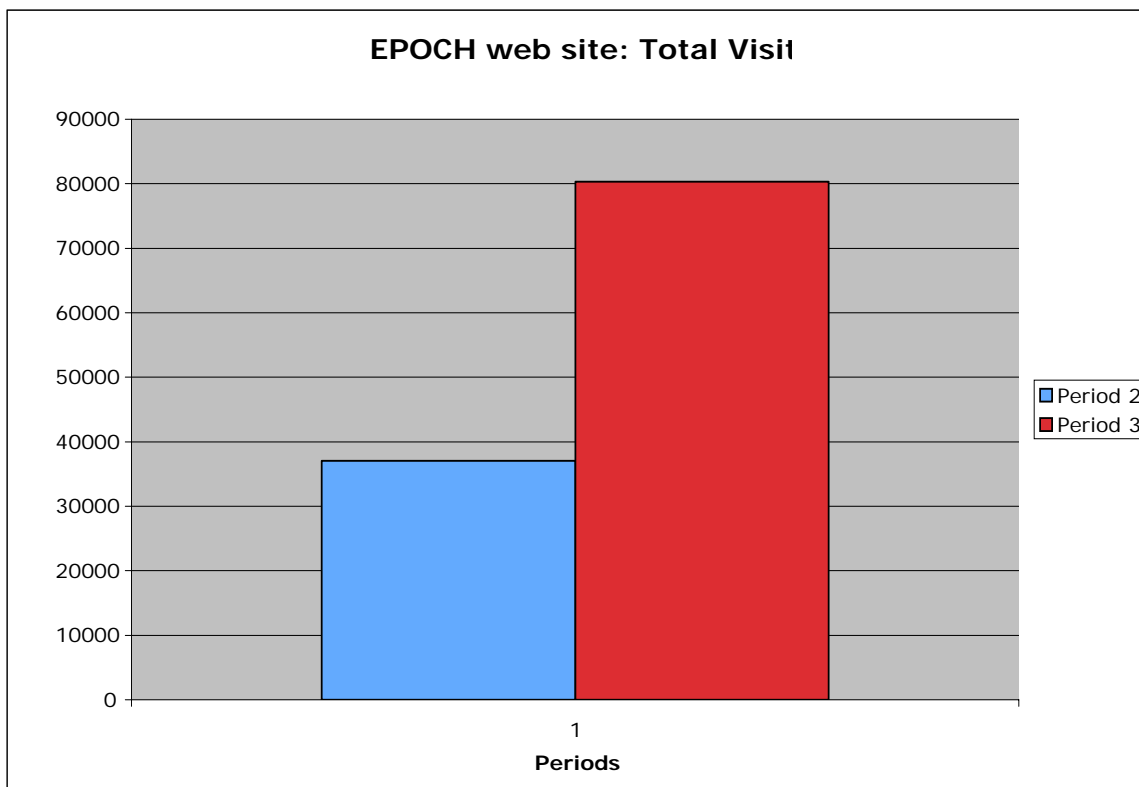


The peak in October 2006 probably corresponds to VAST2006, while the forecast for May 2007 seems to confirm that the peak in April 2007 is not an isolated case.

EPOCH web site: total bandwidth



EPOCH web site: Total Visit



As shown above, the traffic generated by the website has increased by 80% (from 15,5 GB of the period 2 to the 27,8 GB recorded in April 2007), while the number of visitors has more than doubled with a 117% of increment (80323 number of visits recorded in May 2007 versus 37012 in May 2006). About 20% of the traffic (5,7 GB) has been produced by the download of documents.

Visitors of the EPOCH website have bookmarked it in about 28% of cases. Users have accessed the EPOCH pages directly (i.e. typing the exact URL address in their browser) or from bookmark in about 50% of the cases, and come from Google and other popular search engine for 15%. The remainder are direct links from

pages. There are a greater number of links to the site from outside the EPOCH community and are often included in general portals as answers.com (which lists EPOCH with UNESCO and few others). We also can be accessed through del.icio.us.

Google presents our site as first result for “EPOCH”, surpassing the homonymous item in wikipedia. Searches for “cultural heritage” or “digital cultural heritage” are less effective for the inflation of pages dealing with “cultural heritage” and “digital libraries” – 1.820.000 hits – but “digital tangible cultural heritage” goes straight to EPOCH as well as (although not first, but still in the first result page) “digital tangible heritage”. Often, EPOCH surpasses UNESCO. IT (for Information Technology) as a keyword is confused by the country code .it, while ICT is more selective and in various combinations retrieves EPOCH satisfactorily. Google PageRank of EPOCH website (a numeric value that represents how important a page is on the web calculated by Google taking into account the amount of pages linked to our website) has reached 7/10, generally considered an excellent rank by the Internet community (taking into account that Google homepage itself has a PageRank of 8/10, the same as cordis.europa.eu).

4.1.3 Deviations and corrective actions

There were no deviations in this Period.

4.2 Activity 4.2 Standards

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 has continued from the successful achievements of the previous Period. The London Charter has been further disseminated and a dedicated web site has been opened.

4.2.2 Progress and achievements

EPOCH’s activity on standards has included a number of events.

The activity on standards in Period 3 has started with a meeting on the AMA Newton (which also involves activity on documentation standards) held in Naples on 10-11 July 2006. Then a workshop on documentation standards was held at EAA Conference in Krakow in Sept 2006.

A workshop on standards was during VAST2006 in Nicosia (Oct 2006) and another one at EVA Florence in March 2007. The workshops comprised a tutorial on standards and thesauri and a report on the progress of standards activity. These have also included a demonstration of the new semantic features of MAD. At VAST2006, a joint seminar on interoperability has been organized with BRICKS and DELOS, followed by the participation in the corresponding initiative held in Pisa on 15 February 2007 and organized by DELOS and Multimatch.

The report on standards in museums has been delivered (October 30, 2006) by the partner in charge of it (Oxford ArchDigital), and published on the web site for download.

On 22-23 March 2007, EPOCH organized a workshop in Brussels for archaeological authorities concerning harmonization for documentation standards, attended by some 10 participants.

On 29 March, an EPOCH team attended the RECORDIM meeting in London participating in three technical groups. RECORDIM is a joint initiative by the Getty Museum, CIPA, ICOMOS, English Heritage and other

international institutions concerning the documentation of cultural heritage. A delegation from EPOCH has been invited to join the initiative permanently.

Finally, EPOCH organized a workshop at CAA2007 in Berlin with the attendance of some 50 people.

The activity on the London Charter has consisted of updating and structuring the Charter, (version 2 is now available), opening a dedicated web site, organizing the advisory committee and disseminating it, including the delivery of a paper at VAST2007.

4.2.3 Deviations and corrective actions

There were no major deviations in this Period.

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

According to the requests of reviewers, it was decided to advance 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).

It was also decided to complete the preparation of a curriculum for academic studies in IT applications to Cultural Heritage.

Bursaries and mobility have remained at a steady level, with a continuing number of requests for both, with bursaries concentrating on EPOCH's events and courses.

4.3.2 Progress and achievements

a) training and bursaries

The Summer School planned for September 2007 has been moved to a later period and different location, due to difficulties in arranging the course field activity with the local archaeological authorities, as this was dependent on the current condition of the excavation to be used for the school. The uncertainty on this issue caused a limited number of inscriptions. These individuals were informed well in advance of the cancellation and a similar course (on Digital Documentation) has been planned for June 2007 in another location.

The training activity has so far included tutorials held at VAST2006 on EPOCH tools, and a tutorial on CIDOC-CRM at CAA2007. The former was attended by some 30 people, while the latter involved about 15 participants.

Bursaries have been requested (and granted) for attendance at VAST2006 by three young researchers from Eastern European countries. It was also possible to reach a satisfactory agreement with local organizers to facilitate the attendance of other young researchers to VAST without any charge to the EPOCH budget.

b) curricula

Feedback on the EPOCH Training Offerings and Needs in Europe report has been collected. In general, comments were positive, with just one complaining (wrongly) for not being included. All the others commented favourably the initiative, even when pointing out corrections. Integrations and updates have been posted on the web site as an addendum and may be downloaded with the report. Furthermore, they will be included in the revised issue of it.

A preliminary version of the EPOCH curriculum has been prepared and is being circulated for comments. It is planned to launch this at the EPOCH training event scheduled for November 2007. This event had been originally planned for early 2007. However, initial contacts with invited speakers evidenced that it might take place with greater participation and success in the framework of another event. The event has therefore been included in the Paestum conference (16-19 November 2007) – which usually includes curricula presentations and discussion – where it will allow the attendance of a good number of academic authorities.

c) Mobility

A number of researchers have availed themselves of the EPOCH mobility program.

Researchers participating in EPOCH's mobility program in Period 3

Home institution	Guest institution	Length	Period	Completed	PhD student
Ename Center (BE)	PIN (IT)	1 week	late April 2006	Yes	No
University of Brighton (UK)	PIN (IT)	1 week	late April 2006	Yes	No
Salzburg Research	PIN (IT)	4 weeks	April-May 2006	Yes	No
UPM (ES)	Univ. of Brighton (UK)	12 weeks	May-July 2006	Yes	No
University of Kent (UK)	Univ. of Bologna (IT)	4 weeks	June-July 2006	Yes	Yes
University of Bologna (IT)	University of Kent (UK)	4 weeks	Autumn 2006	Yes	Yes
Tecnologico de Monterrey (MX)	various partners (IT-UK)	3 weeks	July 2006	Yes	No
Archaeolingua (HU)	various partners (UK)	3 weeks	March 2007	Yes	No

From the above overview, it appears that mobility has reached a satisfactory level both for 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 average length is about 2/3 weeks, or very short stays. No substantial improvement has affected relocation, which is still very difficult because of administrative and legislative barriers.

c) Events

Events managed/organized/attended by EPOCH in Period 3 include those listed below.

N.	Place and date	Title of the event	Type of event	Activity	Participants Media
1	Prague (CZ) 17-18 June 2006	XML Conference	International Scientific Conference	Presentation of EPOCH MAD tool	100
2	Las Palmas de Gran Canaria (SP) 19-23 July 2007	Meetings with officers and local administrators	Meeting	Presentation of EPOCH solutions and discussion about local CH issues	30 Article on local newspaper
3	Boston (USA) 30 Jul – 3 Aug 2006	SIGGRAPH	International Scientific Conference	Tutorial "Procedural Modeling of Urban Environments"	30
4	Cracow (PL) 19-24 Sep 2006	12th EAA Annual Meeting	International Scientific Conference	Organization of two sessions on EPOCH	600

N.	Place and date	Title of the event	Type of event	Activity	Participants Media
5	Paris (FR) 25-26 Sep 2006	Meeting with UNESCO WH Center and ICOMOS	Meetings	EPOCH presentation to the World Heritage Center and to the ICOMOS ICIP	30
6	Dubrovnik (HR) 27-30 Sep 2006	International EAHTR Symposium 2006	International Symposium	Presentation of the EPOCH socio-economic impact model	150
7	Jaen (SP) 2-3 Oct 2006	EPOCH Regional Meeting	Workshop	Presentation of EPOCH tools (see separate report)	40
8	Stockholm (SE) 17 Oct 2006 – 30 Mar 2007	Interactive Salon	Exhibition	Demonstration of EPOCH tools (see separate report), interaction with visitors	6000
9	Nicosia (CY) 30 Oct – 4 Nov 2006	VAST2006 + joint event	International Conference	Organization of the event Exhibition (see separate report)	300 Articles, TV
10	Milan (IT) 10 Nov 2006	Focus group of EMF	Meeting with key persons	EPOCH presentation and discussion of Research Agenda	7
11	Carrara (IT) 15-18 Nov 2006	Dire&Fare	Exhibition	EPOCH presentation (see separate report) Stand	3500
12	Paestum (IT) 15-18 Nov 2006	9th BMTA	Exhibition	Presentation, session organized, exhibition	8500 Articles, TV interviews
13	Helsinki (FI) 21-23 Nov 2006	IST Event	International Conference	“Interdisciplinary perspectives of ICTs for cultural heritage applications” workshop	30
14	Oslo (NO) 7-9 Dec 2006	NODEM	International Conference	EPOCH key-note speeches	160
15	Rotterdam (NL) 12-13 Dec 2007	Digitaal Erfgoed Nederland (DEN)	Conference	EPOCH key-note speech	100
16	Alicante (SP) 15-16 Dec 2006	Innovation in Archaeological Museums	Conference	EPOCH presentation, distribution of material	100
17	Cairo (EG) 23 Jan – 4 Feb 2007	Cairo International Book Fair	Exhibition	Presentation of EPOCH publications at stand	NA
18	Tel Aviv (IL) 25-26 Jan 2007	Meetings with officers and president of ICOMOS Israel	Meeting	EPOCH presentation	15
19	Ghent (BE) 21-24 Mar 2006	The Future of Heritage	Symposium	EPOCH presentation	120
20	Ferrara (IT) 22-25 Mar 2007	Salone del Restauro	International Exhibition & Conference	EPOCH stand and session (see separate report)	28000
21	Berlin (DE) 2-6 Apr 2007	CAA2007	International Scientific Conference	EPOCH stand, workshops and sessions	250
22	Perugia (IT) 15-18 Apr 2007	Web3D International Symposium	International Scientific Conference	Tutorial on the London Charter	40
23	Alicante (SP) 30 Apr – 2 May 2007	EMF Conference and EMYA Award	Symposium	EPOCH key-note speech	140

Further details on events and in general on dissemination are available in D.4.11.

4.3.3 Deviations and corrective actions

Deviations from plans in this Period are included, and justified, 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 since then.

4.4.2 Progress and achievements

Publications in the relevant period include:

1. J. McLoughlin, J. Kaminski and B. Sodagar (eds.) *Heritage Impact 2005. Proceedings of the first international symposium on the socio-economic impact of cultural heritage*. 143 pages
2. M. Ioannides, D. Arnold, F. Niccolucci and K. Mania (eds.) *The e-volution of Information Communication Technology in Cultural Heritage. Short papers from the joint event VAST2007*. 238 pages
3. M. Ioannides, D. Arnold, F. Niccolucci and K. Mania (eds.) *The e-volution of Information Communication Technology in Cultural Heritage. Project papers from the joint event VAST2007*. 352 pages
4. E. Jerem, Z. Mester and R. Benczes (eds.) *Archaeological and Cultural Heritage Preservation within the Light of New Technologies. Lecture Notes from the Szazhalombatta Course*. 150 pages
5. D. Arnold and G. Geser *Research Agenda for the Application of ICT to Cultural Heritage*. 103 pages
6. D. Arnold and G. Geser *Agenda per la Ricerca sulle Applicazioni delle ICT al Patrimonio Culturale*. Italian translation edited by F. Niccolucci. 101 pages
7. S. Hermon and F. Niccolucci *Communicating Cultural Heritage in the 21st Century. Proceedings of a joint EPOCH-CHIRON workshop*. 140 pages

Additionally, leaflets and other dissemination material has been produced for events. Please refer to D.4.11 for further details and images.

Other media

On 20 November 2006, Prof. David Arnold and Prof. Franco Niccolucci gave a 10 minute interview each on the Italian National TV service RAI concerning EPOCH in the framework of a series on culture. The interviews were broadcast a few days later.

4.4.3 Deviations and corrective actions

There were no deviations in this Period.

Section 3 – Consortium Management

1.1 Objectives of Management Workpackage (from section 9.6.1 of JPA3):

The general objectives of this activity are described in Attachment I. Specific objectives for JPA3 are:

Activity 1: Policy and Procedures. During JPA3 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 JPA2 to JPA3 and further preparation for JPA4, (c) preparing documentation for the Periodic 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 JPA3 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. In addition, the elections for posts to the Executive Committee and Board of Directors will be held.

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.

During the first two Periods the Finance Sub-Committee operations have been established and 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 JPA3 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 two Periods the Review College has been 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 has meant that the full implementation of the review of deliverables before submission has 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. To improve this process and thus the quality of deliverables, 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 JPA3 is to implement fully 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 will allow a unified monitoring process rather than the original concept of orthogonal processes which has 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 were received from the Commission and this guidance has been used as a basis to rationalise and supersede 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 will be coordinated through activity 1.4 with collection undertaken under that activity to which the data relates, but with guidance and monitoring from Activity 1.4. The data collection schema is documented in the revised section 7.2. The planned data collection is the operational component of evidence the high-level integration measures being negotiated as part of reacting to Commission advice on appropriate integration measures for NoEs.

JPA3 covers the section of the project where sustainability and IPR issues need to be addressed and to this end two working groups will be created, drawing from the participants in workpackages 2 and 3 (in particular the Network of Expertise Centers and the Common Infrastructure), and informing the activities in Workpackage 4 related to exploitation and dissemination.

Commentary on progress against objectives

The process of formulating the detailed JPA3 became more onerous than expected due to the need to incorporate all the information on carry-forward of budget and activity into the JPA. This involved preparation of a new budgeting system linked directly to the previous cost claim data and agreement of processes within the project executive for responding to a variety of different budgetary situations. In addition the accession of the 11 new partners and the substantial involvement of two of them in senior, pivotal roles had to be managed in the situation when the new contract was not yet in place. This meant that they were unable to receive advances to fund their participation and yet their roles were pivotal in delivering the objectives of JPA3. This situation was managed by the administrative team and the fact that the eventual formal approval of the work under JPA3 was not received until after the end of Period 3 has not been allowed to have a disproportionate impact on the work undertaken in workpackages 2, 3 and 4.

The additional complications have had an impact on the intentions to finalise some procedural developments, most notably in the adoption of the on-line management tool and in the full implementation of the EPOCH reviewer website. Progress has been made in both of these areas, but the actual transfer of critical processes to the new tools has had to be postponed in order to secure the requirements of returning information to the commission in a timely way. Thus the online management tool is now operational and fully populated with historic data, but it was felt the partner training required to move to distributed implementation could not be supported in parallel to the collection of the cost claim and other reporting data. Similarly the review of deliverables has been implemented using manual processes, and has also been impacted by the pressures of the first

call in FP7 and the availability of reviewers caught up in both preparing for and assessing proposals.

As part of the operation of Activity 1.2 Network management: planning and monitoring, the database of all associated researchers was revised which involved a lot of individual dealings with new personnel in the partners and explanation of who should be included and why the data was required. Subsequent to that process an election was conducted for a researcher to join the Executive Committee and Cinzia Perlingieri of University of Naples "l'Orientale" was elected. Cinzia will join the EPOCH Executive and also attend the Board of Directors with immediate effect.

Under activity 1.3 Financial Control and Budget Planning two major exercises were undertaken during the period. The first was to link the Cost Claim Period 2 data to the budget planning system for JPA3. This involved:

- reconciliation of the two cost claims to date;
- calculation of individual partner carry-forwards;
- implementation of agreed rules on retaining carry-forwards;
- resolution of a number of anomalies of joint partners (two separate groups and budgets but a single legal partner);
- splitting of activities (for example those of Ename from those transferred to Visual Dimension);
- accounting for amendments to Cost Claim Period 1 included with Cost Claim Period 2;
- resolving issues of claims by partners under the wrong cost model or outside of the agreed consortium rules;
- extension of all planning sheets for the new partners;
- alignment of the budgeting sheets for JPA18 and JPA2 in terms of numbers of activities and any adjustments from Cost Claim Period 2 to activities complete in Period 1
- extension of the system to generate the tables required in the JPA semi-automatically and;
- adaptation of both old and new budgets to the re-aligned period dates.

The second exercise involved a complete reconciliation of all the transactions involving commitment of “unallocated” funds to ensure that the appropriate overheads had been committed as well.

In activity 1.4 Monitoring and Evaluation there have been improvements in the ways in which deliverables have been reviewed, though the situation with respect to WP2 and the coordinator’s personal involvement over a substantial period with the drafting of D2.11 Research Agenda has impacted the full implementation of the intended improvements and the operation of the review college website.

The review process and the new rules on the agreement for final agreement in approval for JPA3 in order to finalise the Cost Claim for Period 2 presented significant challenges. 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 two months (either in-person or by recorded conference call) and the Board has met twice in the Period. This has involved liaison with the organisers of a number of international events (VAST06, CAA07).

- Once the breakdown explanations of the payment received for the Period 2 Cost Claim and JPA3 pre-financing were available, payments were dispatched swiftly, with an average time to action payment of around one week.
- All deliverables have been processed, once received from the Work packages, to tight time frames. Some alternative arrangements had to be made to accommodate the transition of the Workpackage 2 Leadership from a core partner organisation to an organisation outside the Network.
- The lessons learnt from the Period 2 Cost Claim have been used in updating the guide for the Period 3 Cost Claim. This has proved invaluable as the member of staff responsible for this area was unfortunately involved in a car accident and was unable to work during the Cost Claim preparation period. A replacement was found, and through shared knowledge, the guide and comprehensive records of the process in the previous periods, the task has been achieved despite this major setback. A full report of the status of the financial claim is included in the Periodic Management Report.
- 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. In addition the Deputy for WP4 also experienced an enforced period of absence and meaning that for significant periods the expected additional executive capacity has not been available. These pressures 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 the election of a representative from the Consortium to the Executive Committee

Overall this has been a successful period for the management of the project. Some significant challenges have been faced but overall partners have been empowered to deliver significant strategic advances in support of the network whilst they have in general been protected against overly burdensome administrative procedures, whilst the substantive requirements of the Commission are believed to have been met.

1.2 Contractors

The following new contractors formed part of an amendment request with the last revision of the JPA and email confirmation of approval was received on 13 June 2007:

- Regency Town House, UK
- Salzburg Research Forschungsgesellschaft, Austria
- Rijksdienst voor het Oudheidkundig bodemonderzoek (Dutch National Service for Archaeological Heritage - ROB), Netherlands
- Visual Dimension, Belgium
- King's College, London, UK
- CINECA, Italy
- C2RMF, France
- F.O.R.T.H., Greece

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

An amount of €2,241,882.36 in payment of Cost Claim for Period 2 and pre-financing for JPA3 was received by the Coordinator on 28 November 2006.

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

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.

1.4 Project timetable and status (GANNT chart from JPA3)

Activity	Sub-Activity	P3Q1			P3Q2			P3Q3			P3Q4			P4Q1			P4Q2			P4Q3			P4'Q4			
		M1	M2	M3	M4	M5	M6	M7	M8	M9	M10	M11	M12	M1	M2	M3	M4	M5	M6	M7	M8	M9	M10	M11	M12	M1
1.1 Policies and procedures	Citizens' Charter																									
	P&P Manual maintenance, annual revision and vote											✓														
1.2 Network Management, Planning and Monitoring	Executive Committee Meetings (every 3 months in person)	□	□	□	□	□	□	□	□	□	□	□	□	□	□	□	□	□	□							
	Interim and Periodic Activity Reports						∞						∞						∞							
	Board of Directors Meetings						□						□						□							
	Launch of Affiliate Participant Scheme									∞																
	Update Plan to Use & Disseminate Knowledge												∞													
	Annual Reports of the Board												∞													
	Assembly General Meeting (Spring meeting 2007 tbc)						■						■			■			■			■				
Establish additional Working Groups (as necessary)																										
1.3 Financial Control/Budget	Annual accounts and audit report						✓									∞			✓							
	Next Year's Budget Plan															∞			✓							
1.4 Monitoring and Evaluation	Invitation to add members to the Review College									∞			∞													
	Determine Applications/constituency Assignments of Review College members												✓													
	Update of the Review college												■			■										
2.1 Sector Watch	Stakeholder needs Reports												∞													
	E-consultation on Period 2 Stakeholder Needs report						✓																			
	E-consultation on Period 2 Vertical Integration report						✓																			
	E-consultation on Period 2 Horizontal Integration report						✓																			
2.5 Develop Research Agenda	Research Agenda Presentation IST2006									✓																
	Production of Common Research Agenda for review									✓																
	E-consultation/vote on adoption												✓													
2.6 Socio-Economic Impact	Annual report on socio-economic impact												∞													
	E-consultation						✓									✓										
	Heritage Impact Symposium						✓									✓										
2.7 Brokerage	Invitation/reminder to update online information for brokerage.									∞																
	E-consultation on process priorities						✓									✓										
2.8 Encouragement of SME Participation	Launch of Expertise centres and Virtual Learning Cluster Scheme																									
	Annual report on encouraging SMEs												∞													
	E-consultation						✓									✓										

Activity	Sub-Activity	P3Q1			P3Q2			P3Q3			P3Q4			P4Q1			P4Q2			P4Q3			P4'Q4			
		M1	M2	M3	M4	M5	M6	M7	M8	M9	M10	M11	M12	M1	M2	M3	M4	M5	M6	M7	M8	M9	M10	M11	M12	M1
3.1 Coordinate research activities	Concertation Meetings																									
	Report on CH related IT research																									
	Reports on Concertation Meetings																									
3.2 NEWTONs	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 (replaced by presentation at CAA 2007, Berlin)																									
	E-vote on Architecture and Components																									
	Design and benchmarking workshop																									
	Technical benchmarking review meeting																									
	Implementation/adaptation of open software tools/common infrastructure																									
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																									
	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																									
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 the JPA and hence not all of these specific sub-activities remain.

1.5 Measures of Integration

Expected Results			Intermediate steps (milestones)				Progress Indicators			
			Period 1	Period 2	Period 3	Period 4	Period 1	Period 2	Period 3	Period 4
1		Communications inside the network								
	1.1	EPOCH version - Fast performing communications	All individuals associated with EPOCH have individual secure access to shared website areas	Website functionality tested in real use and workplan established to improve performance	Re-evaluated to take into account increasingly populated repositories	Business model for sustained access by all partners to continuing resource has been established	Completed - plus individual PW and IDs issued for each voting	website redesign completed and hosting moved to better service	Done. Web site sections developed (e.g. NoEC pages and download area, wiki for 3D, etc.) to take into account emerging needs.	
	1.2	Compatible and harmonised informatics tools	Website services in support of EPOCH activities established	Management tools implemented and linked to EPOCH planning	Refine functionality and performance in the light of real usage needs	Establish sustainable basis for continuing operations of website	range of services established	Tools implemented but not yet populated with data	In progress, but still with partial population of data.	
	1.3	Common classification methodology		Evaluate multi-lingual HEREIN thesaurus for EPOCH needs	Develop EPOCH thesaurus from other sources	Publish results for wider use		Evaluated thesaurus - which is v. limited in scope	Other thesauri analysed and work on implementation started but still in progress	
	1.4	Common codification	Identify initial set of standards and best practice guides for EPOCH purposes	Define EPOCH profiles or subsets of the initial set	Investigate and identify interoperability issues in practice	Publish EPOCH guides and profiles	Done	Process started but not a complete draft	After fixing decisions on standards and formats, the implementation of Tool Chains started.	
	1.5	Common data base accessible to all participants	Establish framework for repositories	Populate repositories and test for performance	Enhance volume and range of data types in repositories	Establish sustainable operations model for maintenance of assets	Done	Process started but less than full coverage	- repository of 3D models created with EPOCH tools has been extended (incl. 3D model of Pompeii) - style grammars for case study architectures available were added	

Expected Results			Intermediate steps (milestones)				Progress Indicators			
			Period 1	Period 2	Period 3	Period 4	Period 1	Period 2	Period 3	Period 4
2		Sharing and common management of equipment, installations, infrastructure								
	2.1	Installations, infrastructure, equipment commonly owned or under shared use	Define inventory of open and other available tools within EPOCH	Design initial set of NEWTON tools and common infrastructure (CI)	Complete first batch of NEWTONs integrated into the CI	2nd Batch of NEWTONs completed and integrated in the CI	Done - but requires constant update	Done and significant interoperability and open source included	Several NEWTON and CI tools are now available (3D webservice, portable IBR dome, BTF setup, MeshLab, VHD++, ...)	
	2.2	Agreements for use of the equipment, installations, infrastructures	Define brokerage scheme for large scale and scarce resources	Establish areas of specialism for initial set of centres of expertise	Complete coverage of needs for expertise within the set of centres	Establish sustainable model for long-term operations of centres of expertise	Defined	Done or in progress - expansion envisaged	A quite complete description of the functionality, know-how and skills needed within the expertise centres is available in several texts. This will be combined shortly.	
	2.3	Common rules on utilisation	Open source and open licensing needs identified	Model licenses for NEWTONs and CI agreed	Licensing implemented for initial set of NEWTONs and CI	All partners agree arrangements for complete set of NEWTONs and CI	Basic need agreed and used to define NEWTON strategy	Not yet complete but some exemplars defined	Availability conditions more specific for majority of tools - portable dome available for use (e.g. current use by Cornell Un.) under renting agreement - 3D webservice available, conditions on the website - high-range BTF acquisition setup available for use at Bonn, free use upon appointment with Bonn staff - MeshLab software available under specified license - VHD++ software available under specified license	
	2.4	Conditions for use	As for 2.3	As for 2.3	As for 2.3	As for 2.3	As for 2.3	As for 2.3	As for 2.3	

Expected Results		Intermediate steps (milestones)				Progress Indicators			
		Period 1	Period 2	Period 3	Period 4	Period 1	Period 2	Period 3	Period 4
3	Common management of human resources								
	3.1 Short/long term mobility programmes	Agreed schemes for mobility, bursaries etc	Plan in operation, monitor and improve for better coverage/ accessibility amongst partners	define longer term sustainable staff exchange scheme rules	Sustainable system in operation	Done and schemes initiated	Monitoring and progress in improving coverage	Short term mobility very well accepted and used. Long term (>2 months) difficult for administrative reasons out of NoE's control (e.g. local regulations, institutional policies etc.)	
	3.2 Common training programme	Inventory of training needs and offerings amongst EPOCH partners	Define HR tailored development program for EPOCH partners activities	Roll out program to identified partners	Link program delivery to business model of Centres of Expertise	Done and schemes initiated	Plans for EPOCH approved programs initiated	Done. Draft curriculum prepared and currently under revision.	
	3.3 Harmonised working conditions			Identify specific roles in EPOCH project teams and HR development plans	Establish recognition by partners of agreed training programs delivered through Centres			Process has begun – through bursaries and mentoring and NoEC training programme	

Expected Results		Intermediate steps (milestones)				Progress Indicators			
		Period 1	Period 2	Period 3	Period 4	Period 1	Period 2	Period 3	Period 4
4	Common knowledge management								
4.1	Sharing of the pre-existing knowledge	Identify Additional PEKH being brought in via NEWTON teams	Agree NEWTONs functionality and rules for use by EPOCH partners	Implement agreement for an initial set of NEWTONs	Modify scheme in the light of experience and get all partners and NEWTON teams signed up for full implementation	Done	NEWTONs agreed and investigation of rules for use begun	All NEWTONs specified availability conditions or in the process of doing so.	
4.2	Distribution of the intellectual property rights inside the network;	Identify open source and open licensing variants suitable for EPOCH	define sufficient minimum set of standard prototypical agreements	Identify and agree which EPOCH tools will use which standard agreements	Get all partners signed up for all EPOCH tools + CI	Some initial work but domain is complex	not done - some exemplar arrangements defined	- conditions of use clarified for several tools - some outstanding, e.g. depending on spin-off creation	
4.3	Common patents etc.	not expected to be relevant to EPOCH . Any patents arising will be treated similarly to 4.2				still not expected to be relevant and might damage engagement			

Expected Results		Intermediate steps (milestones)				Progress Indicators			
		Period 1	Period 2	Period 3	Period 4	Period 1	Period 2	Period 3	Period 4
5	Network management								
5.1	Legal structure representing participants and network as such		Identify aspects of EPOCH business suitable for legal representation	Decide streamlined decision making process for some areas (particularly EPOCH Centres of Expertise)	Implement sustainable mechanism beyond NoE funded period		Process begun - consideration being given to legal status for NoEC	There is a detailed proposal for the structure of the Network of Expertise, that needs formal approval by the involved partners, so that implementation can take place before November	
5.2	Decisional procedure based on majority	Majority voting in place for EPOCH business				Done	Some concern that fully democratic process may be undesirably inefficient	Done	
5.3	Participation of all involved organisations	Nominated Assembly representatives for EPOCH partners already in place.				Done	Done and updated	Done and updated	
5.4	Steering Committee (governing board)	Draft Policy and Procedures for governance already established	Review draft P&P and revise as necessary	Define sustainable strategy agreed by sample centres of expertise	Roll out to all EPOCH Centre of expertise	Done	Done but haven't produced complete redraft	See 5.1, this proposed structure contains a Steering Committee governing the Network of Expertise, it is quite clear how to populate that, but no names pinpointed yet.	

Expected Results		Intermediate steps (milestones)				Progress Indicators			
		Period 1	Period 2	Period 3	Period 4	Period 1	Period 2	Period 3	Period 4
6	Continuity of the Network								
6.1	Search for external funding	Test sample of schemes by sub-groups of partners applying for awards. Use 1st DRAFT EPOCH research agenda to define priorities	Review quality control and support service to bids and agree additional services	Provide EPOCH mentoring services in applications to national schemes. Monitor success rates and review support to improve hit rate	Full implementation	Done - priorities voted by partners with some topics defined for seeking funding externally	Not done - some difficulty / reticence of partners in sharing bid stage information	Not done -some difficulty / reticence of partners in sharing bid stage information remains an obstacle.	
6.2	Portfolio of common projects	Some already in place - CHIRON Marie Curie award. Others submitted.	Monitor success rates in FP6 IST call 5 activities by partners. Define support mechanism for partners without extended provision	Implement support opportunities for partners. Identify new successes and publicise to the EPOCH partners		Done	5th call disappointing - though seriously impeded by review process timing	Significant developments in terms of various new subsets of partners engaged in joint bidding processes under different areas of the FP7 Work Programme e.g. on-going developments targeting SME and Capacities as well as the Cooperation programme.	
6.3	Decreasing dependence on Community funding	o Evolution of the yearly Community contribution: decreasing trend, at least the two last years, independently of the expenses linked to the JPA o Creation of an "external funding sources search" function of increasing importance				Delays in starting have effect of moving spending profile forward	Some progress - several national programs identified and some regional promise	A legal entity for the Network of Expertise Centers is to be created which will be able to apply for it's own funding and carry forward much of the work of EPOCH. Several FP7 first call proposals have been submitted which would also progress the work which began / has progressed during the lifetime of EPOCH. Additional submissions are expected in the third IST call.	

1.6 Risk Management

1.6.1 Approach

The original EPOCH contract documentation addressed risk under each activity listed in the Technical Annex.

Following the recommendation from the review meeting in November 2005, the revision of the JPA, and experience gained in the first two Periods of managing the activities of the Network, these risks were re-evaluated and further ones identified. This Risk Register was presented at the Annual Review in July 2006.

Each risk has been taken in turn and the following specified:

Factors	Factors which might lead to the risk occurring
Impact	Low / Medium / High
Mitigating Factors	Those factors which might help avoid the risk
Probability	Low / Medium / High
Early Warning	Events which might point to the risk occurring
Contingencies	Mechanisms put in place to alleviate the risk should it occur
Actions	Actions to take place should the risk occur
Responsibility	Who would be responsible for implementing those actions

The Risk Register thus developed is a dynamic document which is reviewed by Workpackage Management Committees, who may also recommend amendments and / or additions.

1.6.2 Risk Register

	Risk	Factors	Impact	Mitigating Factors	Prob	Early Warning	Contingencies	Actions	Responsibility
1	Failure to get agreement on policies or procedures before a contentious issue arises in the area of the policy and/or procedure.	Moving forward the Policies and Procedures Contentious issue arising	M	Good partner relationships Signed Consortium Agreement in place	H	Misunderstanding policies and procedures	In case of a contentious issue for which there is no specific appropriate policy or procedure in place the Consortium Agreement specifies a mechanism for the resolution of disputes.	Early Intervention	Coordinator

	Risk	Factors	Impact	Mitigating Factors	Prob	Early Warning	Contingencies	Actions	Responsibility
2	With the large consortium it is essential that decision making can proceed in a spirit of cooperation and collaboration. There is a potential risk therefore if the decision making processes become bogged down in disagreement, disruption by lack of cooperation, inappropriate exploitation of rules and inquorate meetings. Similar problems could arise through failure of partners to engage in the decision making processes.	Lack of cooperation, inappropriate exploitation of rules and inquorate meetings Failure of partners to engage	H	Moved decision making to electronic votes Mechanisms for disenfranchising those who do not participate. Active solicitation of scalable activities promoting partner engagement	L	Disengagement with voting, comments in voting, very poor attendance at meetings	The rules for meetings have been set so that partners can contribute to agreements and vote on decisions without attending every meeting. At the same time, participation in votes and certain other network activities is defined as an obligation, allowing consistent defaulters to be deemed as "in breach" and dealt with in that way.	Revise Policy and Procedures to regularise revised voting process	Coordinator

	Risk	Factors	Impact	Mitigating Factors	Prob	Early Warning	Contingencies	Actions	Responsibility
3	With the size and complexity of the Network the biggest danger is probably a failure of communications so that planning is progressing in an area of activity without the proper information being fed back to the Finance Sub-Committee in a timely fashion. The risks here are somewhat higher where budgets have been allocated to Activities, but the fine detail of which partners are involved has been left to later decision making.	Expansion of network increasing no of partners and including untrained new comers	M	New partners normally trained as part of start up New partners usually don't hold budget or only exceptionally hold budget	L	Contract preparation forms	The risks will be minimised by having a program of induction defined for newly appointed activity or sub-activity leaders, and by providing advise and feedback during the planning phase of each new activity. The induction and advice will be backed by written procedures documented in the Network Policies and Procedures Manual.	Define training plan for new budget holders	Coordinator

	Risk	Factors	Impact	Mitigating Factors	Prob	Early Warning	Contingencies	Actions	Responsibility
4	Insufficient engagement by Review College nominees in the process.	Lack of Critical Mass of Review College members Insufficient breadth of nominees interests	L	Initial membership has fair coverage Historic precedents from similar processes suggests that people regularly give time	L	Small numbers in specialisms in original call	The activities and participation of the members of the college will be kept under review and the membership revised to take into account participation/engagement in the college's activities	Additional calls for nominations will be issued annually.	Coordinator

	Risk	Factors	Impact	Mitigating Factors	Prob	Early Warning	Contingencies	Actions	Responsibility
5	Lack of take-up of the research agenda by other actors in the sector leading to disillusion with the Review College process	Lack of clear priorities emerging from the consultations. A segregation of the Review College membership from the consortium partners, resulting in two agendas emerging No patterns produced from Sector watch for what to work on.	H	Workshops will be called and used to further agreements	L	Reactions to initial versions of process	Option for additional calls during the year	Ensure at least annual call Monitor response rates from college members	Coordinator

	Risk	Factors	Impact	Mitigating Factors	Prob	Early Warning	Contingencies	Actions	Responsibility
6	EPOCH technical developments overtaken by development project	Rapid technology development Better educated "lay" users	H	Research team like to follow developments	L	In publications and research reports		Tack publications like ACM Queue	WP 2.1

	Risk	Factors	Impact	Mitigating Factors	Prob	Early Warning	Contingencies	Actions	Responsibility
7	Lack of acceptance of skill sets of EPOCH NoEC groups	Selection has been largely self determined by applicants for r NoEC status	H	Process of select through NoEC and accepting should ensure that quality rises	Y			Training	A2.8

	Risk	Factors	Impact	Mitigating Factors	Prob	Early Warning	Contingencies	Actions	Responsibility
8	Movement of key staff from (core) partners		H		L	Notice period	Contingency - agreement to advise as early as possible any such moves. Where possible ensure at least two named members of staff at each partner organisation are familiar with location and status of EPOCH documents, processes, etc.	Discuss at EXC	Coordinator to place item on agenda

	Risk	Factors	Impact	Mitigating Factors	Prob	Early Warning	Contingencies	Actions	Responsibility
9	Document loss (in particular deliverables)	Need to be certain on deliverable actually sent - hence avoid multiple copies. However this means that the procedure also has fragile times with only one copy of the deliverable around	L	Document could be re-submitted if resubmitted	L	None	Frequent automated back systems	Ensure automatic backup	Coordinator

	Risk	Factors	Impact	Mitigating Factors	Prob	Early Warning	Contingencies	Actions	Responsibility
10	Communication paralysed due to catastrophe in Brighton List server	Original server issue about maintaining list addresses from external sources	H	New server arrangements mean improved system can be implemented	L	None	Implement improved list server of EPOCH machine at Brighton	Better arrangements through website	Coordinator and WP4

	Risk	Factors	Impact	Mitigating Factors	Prob	Early Warning	Contingencies	Actions	Responsibility
11	Incapacity of members of Executive Committee	For this to become a problem both EXC member and deputy would need to be incapacitated at the same time	H	Coverage by deputy usually sufficient	H	Minimal	Contingency - regular updates with WP deputies, and activity leaders at and outside WP Mngt Ctees Spread of knowledge and skill set	Ensuring deputies are kept briefed	EXC members

	Risk	Factors	Impact	Mitigating Factors	Prob	Early Warning	Contingencies	Actions	Responsibility
12	Incapacity of Project Manager		H	Coverage via coordinator and Office Admin team would be feasible in the short term	M	Minimal	Contingency – regular updates with Coordinator and admin team. Training of admin team in Network systems and processes (including those they are not directly involved in).	Project Manager and Admin Team	Project Manager

	Risk	Factors	Impact	Mitigating Factors	Prob	Early Warning	Contingencies	Actions	Responsibility
13	Breakdown of communication between multiple partners contributing to an objective in an activity where there is budget already allocated		H	Mitigating Factor so much work in this area that it is feasible to find	H	Through management reports	Find useful ways of structuring the work to reach a useful conclusion.	Ensure management reports are filed on time and considered at EXC meetings	Coordinator and other EXC members

Annex 1 - Plan for using and disseminating the knowledge

Contents

1	Executive Summary	79
2	EPOCH Mission and the Relationship to the Dissemination Strategy.....	79
3	Implementation.....	80
3.1	Levels of EPOCH involvement	80
3.2	EPOCH events	81
3.3	EPOCH attendance at other events	81
3.4	EPOCH “In collaboration” events	81
3.5	Publications.....	81
3.6	Education, Training and Mobility	82
3.7	Dissemination via the website and internet.....	82
4	Results	82
5	Conclusions	82
	Appendix – List of actual and planned events, and comparison with Period 1 plans	83

5 Executive Summary

This report describes the strategy and tactics adopted by the EPOCH network in the Use and Dissemination of Knowledge in Period 3.

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, including major events used as foci for EPOCH project meetings and as venues for dissemination of the project results. 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.

6 EPOCH Mission and the Relationship to the Dissemination Strategy

As stated in previous Plans for Dissemination, delivered in previous Periods, 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.

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:

- 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.

These stakeholders have different needs, perspectives, priorities and strategies, while the interest of the public at large concerns more implementation, rather than R&D, and probably its first concern is that good value is obtained from public money expenditure.

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

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 Summer Schools 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.

7 Implementation

7.1 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.

7.2 EPOCH events

Several events have seen a large EPOCH involvement. VAST has been the Network's main event, as usual. In Spring, EPOCH has continued the positive experience of EVA Florence and has come back to CAA as its Spring event, hosting its EXC, BoD and GA meetings. A significant presence has also occurred at exhibitions as the Paestum BMTA, the NODEM meeting and the Ferrara Restoration Saloon.

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.

7.3 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 IST Event organized by the EU Commission in Helsinki in November 2006).

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. More such events are planned for 2006/2007, after the one in Spain held in October 2006.

7.4 EPOCH "In collaboration" events

A process is being 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 are being used regularly at events.

7.5 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. In this Period, the number of publications has greatly increased (see D4.12 for further details).

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.

7.6 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.

7.7 Dissemination via the website and internet

The presentations made by EPOCH partners are 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.

7.8 Results

Papers presented at VAST2006 continue to 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.

8 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
Prague (CZ) 17-18 Jun 2006	International Scientific Conference	IT research	International	Not planned	2
Brighton, 29-30 June 2006	International Scientific Conference	Cultural Economics	International	YES	1
Las Palmas de Gran Canaria (SP) 19-23 July 2007	Meeting	Administrators, policy makers, CH	Spain	Not planned	2
Boston (USA) 30 Jul – 3 Aug 2006	International Scientific Conference	IT research	International	YES	48
Cracow (PL) 19-24 Sep 2006	International Scientific Conference	Archaeology	International	YES	2
Paris (FR) 25-26 Sep 2006	Meetings	Heritage, policy makers	International	YES	1, 2, 3, VD
Dubrovnik (HR) 27-30 Sep 2006	International Symposium	Historic cities, policy makers	International	YES	1, 99
Jaen (SP) 2-3 Oct 2006	Workshop	SME, CH	Spain	YES	1, 2, 43, 44, VD
Stockholm (SE) 17 Oct 2006 – 30 Mar 2007	Exhibition	Policy makers, IT&CH research, SME, museums, heritage	Nordic	YES	1, 46, 52, 30, VD
Nicosia (CY) 30 Oct – 4 Nov 2006	International Conference	IT & CH research	International	YES	HTI, 1, 2, 3, 4
Milan (IT) 10 Nov 2006	Meeting with key persons	Museums	CH, DE, SI, NL, IT	Not planned	1, 2

Dates	Type	Type of audience	Countries addressed	Completed as planned	Partner responsible /involved
Carrara (IT) 15-18 Nov 2006	Exhibition	SME, local administrators	Italy	YES	2
Paestum (IT) 15-18 Nov 2006	Exhibition	Public authorities, CH, cultural tourism	Mediterranean countries	YES	1, 2, 68, 98
Helsinki (FI) 21-23 Nov 2006	International Conference	IT Research	Europe	YES	1, 2, 3
Oslo (NO) 7-9 Dec 2006	International Conference	Museums	Nordic	YES	2, 46, 52, VD
Rotterdam (NL) 12-13 Dec 2007	Conference	Digital heritage	The Netherlands	YES	2, ROB
Alicante (SP) 15-16 Dec 2006	Conference	Museums	Europe	YES	2
Cairo (EG) 23 Jan – 4 Feb 2007	Exhibition	CH, general public	Egypt and Mediterranean Countries	Not planned	2
Tel Aviv (IL) 25-26 Jan 2007	Meeting	Monuments, sites	Israel	Not planned	2, IAA
Ghent (BE) 21-24 Mar 2006	Symposium	CH research and professionals	International	YES	1, 3
Ferrara (IT) 22-25 Mar 2007	International Exhibition & Conference	CH, policy makers, restoration	Italy, Europe	YES	1, 2, 68, VD
Berlin (DE) 2-6 Apr 2007	International Scientific Conference	Archaeology	International	YES	2 + all
Perugia (IT) 15-18 Apr 2007	International Scientific Conference	IT Research	International	Not planned	1, 2, 5
Alicante (SP) 30 Apr – 2 May 2007	Symposium	Museums	Europe	YES	2

For a short description of the above events please refer to D.4.12.

All the planned events were completed. Dissemination activities outside Europe (e.g. Brazil, Mexico) were generally postponed waiting for the FP7 call for bi-lateral cooperation activities that looked particularly suitable for funding dissemination, expected for December 2006, then announced for May 2007 but still to be issued.

2.2 Planned dissemination for Period 4

Plans for Period 4 concentrate in Summer 2007 – Autumn 2007, as the project's funded period will end in March 2008. They include:

a) participation in EU-organized events, as

- IST event

b) Scientific Conferences; among others:

- Heritage Impact 2007, already planned for 21 and 22 June in Brighton.
- The VAST2007 Conference, this year planned to take place in Brighton.

b) Museum and heritage related events

- The Interactive Salon exhibition will be repeated in Budapest in Summer and in other venues in Autumn.
- BMTA (Borsa Mediterranea del Turismo Archeologico), November 2007, Paestum, Italy. An event promoting archaeological sites and their connection to cultural tourism, focused on the Mediterranean area.

c) Regional events

- Greece, during the Athens CIPA Conference in October 2007.

Overview table 2 – Planned dissemination for Period 4 (only major events)

Planned dates	Type	Type of audience	Countries	Size of audience	Partner responsible /involved
21-22/06/2007	Conference (Heritage Impact)	Research	Europe	80	1
Summer 2007	Exhibition (Interactive Salon)	Research, professionals	Central European countries	300?	46, 70
November 2007	Exhibition (BMTA)	Cultural tourism	Mediterranean region	500	2
November 2007	Conference (IST Event)	EU IST event	Europe	1000	2
November 2007	Conference (VAST2007)	Research	Europe	50	1

Report on the Distribution of the Community's contribution

Type of Instrument	Network of Excellence	Project Title (or Acronym)	EPOCH	Contract	507382
--------------------	-----------------------	----------------------------	-------	----------	--------

Part I	Community's prefinancing (or payment) sent to the coordinator ⁽¹⁾										
	Reporting Period 1 ⁽²⁾		Reporting Period 2 ⁽²⁾		Reporting Period 3 ⁽²⁾		Reporting Period 4 ⁽²⁾		Final payment		Total Amount (I) ⁽³⁾
	From	To	From	To	From	To	From	To	Date	Amount	
	15/03/2004	14/03/2005	15/03/2005	30/04/2006	1/05/2006	30/04/2007					
Date	Amount (A)	Date	Amount (B)	Date	Amount (C)	Date	Amount (D)	Date	Amount (H)		
Total (X)	25/03/2004	3,035,350.00	29/12/2005	1,531,479.39	1/12/2006	2,241,882.36					6,808,711.75

Contractor n°	Organisation Short Name	Country Code	Distribution of the Community's prefinancing (or payment) between contractors according to the consortium decision(s) ⁽⁴⁾										
			Reporting Period 1		Reporting Period 2		Reporting Period 3		Reporting Period 4		Final payment		Total Amount (I') ⁽⁶⁾
			Date(s) ⁽⁵⁾	Amount(s) (A') ⁽⁵⁾	Date(s) ⁽⁵⁾	Amount(s) (B') ⁽⁵⁾	Date(s) ⁽⁵⁾	Amount(s) (C') ⁽⁵⁾	Date(s) ⁽⁵⁾	Amount(s) (D') ⁽⁵⁾	Date(s) ⁽⁵⁾	Amount(s) (H') ⁽⁵⁾	
1	BRIGHTON		25/03/2004	444,550.00	29/12/2005	224,193.17	1/12/2006	429,770.08					1,098,513.25
			30/11/2004	-10,118.00	Various	37,411.71	Various	144,040.77					171,334.48
			7/03/2005	-1,786.00									-1,786.00
			10/03/2005	1,429.00									1,429.00
			Total	434,075.00	Total	261,604.88	Total	573,810.85	Total	0.00	Total	0.00	Total
2	PIN		5/04/2004	347,650.00	13/02/2006	190,515.00	6/02/2007	240,764.00					778,929.00
					18/03/2005	14,804.22	8/08/2006	15,300.00					30,104.22
					1/04/2005	14,941.40	11/09/2006	23,996.91					38,938.31
					1/04/2005	5,500.00	5/04/2007	8,500.00					14,000.00
					1/04/2005	6,473.40							6,473.40
					19/07/2005	420.17							420.17
					6/09/2005	1,050.00							1,050.00
					6/09/2005	28,000.00							28,000.00
					6/09/2005	3,000.00							3,000.00
					6/09/2005	500.00							500.00
					15/02/2006	20,000.00							20,000.00
					15/02/2006	15,000.00							15,000.00
					15/02/2006	600.00							600.00
					15/02/2006	1,500.00							1,500.00
		Total	347,650.00	Total	302,304.19	Total	288,560.91	Total	0.00	Total	0.00	938,515.10	
3	ENAME CENTER		7/04/2004	363,800.00	13/02/2006	276,850.00	8/05/2006	-31,450.00					609,200.00
			4/03/2005	8,500.00	1/04/2005	12,750.00	6/02/2007	31,659.00					52,909.00
			4/03/2005	8,500.00	6/09/2005	9,200.00							17,700.00
					6/09/2005	9,200.00							9,200.00
		Total	380,800.00	Total	308,000.00	Total	209.00	Total	0.00	Total	0.00	689,009.00	
4	KU LEUVEN		31/03/2004	263,500.00	3/02/2006	75,939.00	6/02/2007	143,449.00					482,888.00
					15/02/2006	1,000.00	6/02/2006	85,000.00					86,000.00
													0.00
													0.00
		Total	263,500.00	Total	76,939.00	Total	228,449.00	Total	0.00	Total	0.00	568,888.00	
5	TU GRAZ			0.00	25/04/2006	36,195.00	6/02/2007	85,848.00					122,043.00
							8/05/2006	36,195.06					36,195.06
													0.00
													0.00
		Total	0.00	Total	36,195.00	Total	122,043.06	Total	0.00	Total	0.00	158,238.06	
6	VUT-PRIP			0.00		0.00		0.00					0.00
													0.00
													0.00
													0.00
		Total	0.00	Total	0.00	Total	0.00	Total	0.00	Total	0.00	0.00	
7	UIBK			0.00	3/02/2006	6,800.00	6/02/2007	6,800.00					13,600.00
													0.00
													0.00
													0.00
		Total	0.00	Total	6,800.00	Total	6,800.00	Total	0.00	Total	0.00	13,600.00	

Part II			Distribution of the Community's prefinancing (or payment) between contractors according to the consortium decision(s) ⁽⁴⁾											
Contractor n°	Organisation Short Name	Country Code	Reporting Period 1		Reporting Period 2		Reporting Period 3		Reporting Period 4		Final payment		Total Amount (I) ⁽⁶⁾	
			Date(s) (5)	Amount(s) (A) ⁽⁵⁾	Date(s) (5)	Amount(s) (B) ⁽⁵⁾	Date(s) (5)	Amount(s) (C) ⁽⁵⁾	Date(s) (5)	Amount(s) (D) ⁽⁵⁾	Date(s) (5)	Amount(s) (H) ⁽⁵⁾		
39	UIO		31/03/2004	22,100.00	3/02/2006	2,762.00	6/02/2007	21,716.00					46,578.00	
													0.00	
														0.00
			Total	22,100.00	Total	2,762.00	Total	21,716.00	Total	0.00	Total	0.00	Total	46,578.00
40	IPTOMAR			0.00									0.00	
													0.00	
													0.00	
			Total	0.00	Total	0.00	Total	0.00	Total	0.00	Total	0.00	Total	0.00
41	UAB			0.00									0.00	
													0.00	
													0.00	
			Total	0.00	Total	0.00	Total	0.00	Total	0.00	Total	0.00	Total	0.00
42	UVEG		31/03/2004	850.00									850.00	
													0.00	
													0.00	
			Total	850.00	Total	0.00	Total	0.00	Total	0.00	Total	0.00	Total	850.00
43	CAAI			0.00									0.00	
													0.00	
													0.00	
			Total	0.00	Total	0.00	Total	0.00	Total	0.00	Total	0.00	Total	0.00
44	DIPUJAEN			0.00									0.00	
													0.00	
													0.00	
			Total	0.00	Total	0.00	Total	0.00	Total	0.00	Total	0.00	Total	0.00
45	UPM			0.00									0.00	
													0.00	
													0.00	
			Total	0.00	Total	0.00	Total	0.00	Total	0.00	Total	0.00	Total	0.00
46	II		31/03/2004	35,700.00	13/02/2006	12,260.00	6/02/2007	73,444.00					121,404.00	
													0.00	
													0.00	
			Total	35,700.00	Total	12,260.00	Total	73,444.00	Total	0.00	Total	0.00	Total	121,404.00
47	KAU NOM GEO			0.00									0.00	
													0.00	
													0.00	
			Total	0.00	Total	0.00	Total	0.00	Total	0.00	Total	0.00	Total	0.00
48	ETH		7/04/2004	173,400.00	3/02/2006	18,559.00	6/02/2007	58,837.00					250,796.00	
					30/03/2006	15,000.00	9/10/2006	1,500.00					16,500.00	
													0.00	
			Total	173,400.00	Total	33,559.00	Total	60,337.00	Total	0.00	Total	0.00	Total	267,296.00

Part II			Distribution of the Community's prefinancing (or payment) between contractors according to the consortium decision(s) ⁽⁴⁾										
Contractor n°	Organisation Short Name	Country Code	Reporting Period 1		Reporting Period 2		Reporting Period 3		Reporting Period 4		Final payment		Total Amount (I) ⁽⁶⁾
			Date(s) (5)	Amount(s) (A) ⁽⁵⁾	Date(s) (5)	Amount(s) (B) ⁽⁵⁾	Date(s) (5)	Amount(s) (C) ⁽⁵⁾	Date(s) (5)	Amount(s) (D) ⁽⁵⁾	Date(s) (5)	Amount(s) (H) ⁽⁵⁾	
49	UNIGE		5/04/2004	76,500.00	3/02/2006	38,333.00	4/01/2007	45,266.00					160,099.00
							8/05/2006	15,000.00					15,000.00
													0.00
													0.00
			Total	76,500.00	Total	38,333.00	Total	60,266.00	Total	0.00	Total	0.00	175,099.00
50	EPFL		7/04/2004	76,500.00	3/02/2006	55,000.00	4/01/2007	42,175.00					173,675.00
													0.00
													0.00
													0.00
			Total	76,500.00	Total	55,000.00	Total	42,175.00	Total	0.00	Total	0.00	173,675.00
51	NO PARTNER 51		n/a										0.00
													0.00
													0.00
													0.00
			Total	0.00	Total	0.00	Total	0.00	Total	0.00	Total	0.00	0.00
52	UNIKENT		31/03/2004	57,800.00	3/02/2006	31,049.00	4/01/2007	61,226.00					150,075.00
					23/11/2005	6,000.00	9/10/2006	2,025.18					8,025.18
							5/04/2007	8,500.00					8,500.00
													0.00
			Total	57,800.00	Total	37,049.00	Total	71,751.18	Total	0.00	Total	0.00	166,600.18
53	UYORK			0.00									0.00
													0.00
													0.00
													0.00
			Total	0.00	Total	0.00	Total	0.00	Total	0.00	Total	0.00	0.00
54	UNIVBRIS			0.00									0.00
													0.00
													0.00
													0.00
			Total	0.00	Total	0.00	Total	0.00	Total	0.00	Total	0.00	0.00
55	UBRUNEL		28/04/2004	17,000.00			4/01/2007	4,537.00					21,537.00
													0.00
													0.00
													0.00
			Total	17,000.00	Total	0.00	Total	4,537.00	Total	0.00	Total	0.00	21,537.00
56	UEA		31/03/2004	81,600.00	1/02/2006	58,865.00	4/01/2007	47,483.00					187,948.00
			30/11/2004	10,118.00			5/04/2007	8,500.00					18,618.00
			7/03/2005	1,786.00									1,786.00
													0.00
			Total	93,504.00	Total	58,865.00	Total	55,983.00	Total	0.00	Total	0.00	208,352.00
57	NO PARTNER 57		n/a										0.00
													0.00
													0.00
													0.00
			Total	0.00	Total	0.00	Total	0.00	Total	0.00	Total	0.00	0.00
58	UNIS		7/04/2004	61,200.00	1/03/2006	13,200.00	4/01/2007	71,483.00					145,883.00
													0.00
													0.00
													0.00
			Total	61,200.00	Total	13,200.00	Total	71,483.00	Total	0.00	Total	0.00	145,883.00

Part II			Distribution of the Community's prefinancing (or payment) between contractors according to the consortium decision(s) ⁽⁴⁾											
Contractor n°	Organisation Short Name	Country Code	Reporting Period 1		Reporting Period 2		Reporting Period 3		Reporting Period 4		Final payment		Total Amount (I) ⁽⁶⁾	
			Date(s) (5)	Amount(s) (A) ⁽⁵⁾	Date(s) (5)	Amount(s) (B) ⁽⁵⁾	Date(s) (5)	Amount(s) (C) ⁽⁵⁾	Date(s) (5)	Amount(s) (D) ⁽⁵⁾	Date(s) (5)	Amount(s) (H) ⁽⁵⁾		
59	WARWICK			0.00									0.00	
													0.00	
														0.00
			Total	0.00	Total	0.00	Total	0.00	Total	0.00	Total	0.00	Total	0.00
60	UOS		5/04/2004	25,500.00			4/01/2007	3,986.00					29,486.00	
													0.00	
														0.00
			Total	25,500.00	Total	0.00	Total	3,986.00	Total	0.00	Total	0.00	Total	29,486.00
61	PPL		31/03/2004	36,550.00	3/02/2006	10,088.00	4/01/2007	28,899.00					75,537.00	
													0.00	
														0.00
			Total	36,550.00	Total	10,088.00	Total	28,899.00	Total	0.00	Total	0.00	Total	75,537.00
62	NO PARTNER 62			n/a									0.00	
													0.00	
														0.00
			Total	0.00	Total	0.00	Total	0.00	Total	0.00	Total	0.00	Total	0.00
63	CYX (WITHDRAWN)			n/a									0.00	
													0.00	
														0.00
			Total	0.00	Total	0.00	Total	0.00	Total	0.00	Total	0.00	Total	0.00
64	PLANETEK			0.00									0.00	
													0.00	
														0.00
			Total	0.00	Total	0.00	Total	0.00	Total	0.00	Total	0.00	Total	0.00
65	IST			0.00	13/02/2006	12,750.00	4/01/2007	11,900.00					24,650.00	
													0.00	
														0.00
			Total	0.00	Total	12,750.00	Total	11,900.00	Total	0.00	Total	0.00	Total	24,650.00
66	KTH			0.00									0.00	
													0.00	
														0.00
			Total	0.00	Total	0.00	Total	0.00	Total	0.00	Total	0.00	Total	0.00
67	OAD			0.00	3/02/2006	5,950.00	4/01/2007	2,550.00					8,500.00	
													0.00	
														0.00
			Total	0.00	Total	5,950.00	Total	2,550.00	Total	0.00	Total	0.00	Total	8,500.00
68	IBC		7/04/2004	10,200.00	3/02/2006	9,400.00	4/01/2007	8,737.00					28,337.00	
													0.00	
														0.00
			Total	10,200.00	Total	9,400.00	Total	8,737.00	Total	0.00	Total	0.00	Total	28,337.00

Part II			Distribution of the Community's prefinancing (or payment) between contractors according to the consortium decision(s) ⁽⁴⁾											
Contractor n°	Organisation Short Name	Country Code	Reporting Period 1		Reporting Period 2		Reporting Period 3		Reporting Period 4		Final payment		Total Amount (I) ⁽⁶⁾	
			Date(s) (5)	Amount(s) (A) ⁽⁵⁾	Date(s) (5)	Amount(s) (B) ⁽⁵⁾	Date(s) (5)	Amount(s) (C) ⁽⁵⁾	Date(s) (5)	Amount(s) (D) ⁽⁵⁾	Date(s) (5)	Amount(s) (H) ⁽⁵⁾		
69	NO PARTNER 69			n/a									0.00	
													0.00	
														0.00
			Total	0.00	Total	0.00	Total	0.00	Total	0.00	Total	0.00	Total	0.00
70	ARCHAEOLINGUA		1/05/2004	11,050.00	3/02/2006	14,254.00	4/01/2007	15,995.00					41,299.00	
					6/09/2005	8,000.00	5/07/2006	12,000.00					20,000.00	
							2/11/2006	25,000.00					25,000.00	
			Total	11,050.00	Total	22,254.00	Total	52,995.00	Total	0.00	Total	0.00	Total	86,299.00
71	IBM BELGIUM (WITHDRAWN)		Non accession										0.00	
													0.00	
														0.00
			Total	0.00	Total	0.00	Total	0.00	Total	0.00	Total	0.00	Total	0.00
72	IGM			0.00									0.00	
													0.00	
														0.00
			Total	0.00	Total	0.00	Total	0.00	Total	0.00	Total	0.00	Total	0.00
73	NO PARTNER 73			n/a									0.00	
													0.00	
														0.00
			Total	0.00	Total	0.00	Total	0.00	Total	0.00	Total	0.00	Total	0.00
74	CIMEC		31/03/2006	850.00	10/02/2006	20,800.00	4/01/2007	2,714.00					24,364.00	
						12,000.00							12,000.00	
														0.00
			Total	850.00	Total	32,800.00	Total	2,714.00	Total	0.00	Total	0.00	Total	36,364.00
75	AML		20/04/2004	40,800.00			4/01/2007	29,907.00					70,707.00	
													0.00	
														0.00
			Total	40,800.00	Total	0.00	Total	29,907.00	Total	0.00	Total	0.00	Total	70,707.00
76	UNIREL			0.00	13/02/2006	17,000.00	4/01/2007	9,555.00					26,555.00	
													0.00	
														0.00
			Total	0.00	Total	17,000.00	Total	9,555.00	Total	0.00	Total	0.00	Total	26,555.00
77	NO PARTNER 77			n/a									0.00	
													0.00	
														0.00
			Total	0.00	Total	0.00	Total	0.00	Total	0.00	Total	0.00	Total	0.00
78	TM		31/03/2004	850.00									850.00	
													0.00	
														0.00
			Total	850.00	Total	0.00	Total	0.00	Total	0.00	Total	0.00	Total	850.00

Part II			Distribution of the Community's prefinancing (or payment) between contractors according to the consortium decision(s) ₍₄₎											
Contractor n°	Organisation Short Name	Country Code	Reporting Period 1		Reporting Period 2		Reporting Period 3		Reporting Period 4		Final payment		Total Amount (I') (6)	
			Date(s) (5)	Amount(s) (A') (5)	Date(s) (5)	Amount(s) (B') (5)	Date(s) (5)	Amount(s) (C') (5)	Date(s) (5)	Amount(s) (D') (5)	Date(s) (5)	Amount(s) (H') (5)		
89	NO PARTNER 89			n/a									0.00	
													0.00	
														0.00
														0.00
			Total	0.00	Total	0.00	Total	0.00	Total	0.00	Total	0.00	Total	0.00
90	ITI			0.00									0.00	
													0.00	
														0.00
														0.00
			Total	0.00	Total	0.00	Total	0.00	Total	0.00	Total	0.00	Total	0.00
91	NMS			0.00									0.00	
													0.00	
														0.00
														0.00
			Total	0.00	Total	0.00	Total	0.00	Total	0.00	Total	0.00	Total	0.00
92	UCT			0.00									0.00	
														0.00
														0.00
														0.00
			Total	0.00	Total	0.00	Total	0.00	Total	0.00	Total	0.00	Total	0.00
93	NO PARTNER 93			n/a									0.00	
													0.00	
														0.00
														0.00
			Total	0.00	Total	0.00	Total	0.00	Total	0.00	Total	0.00	Total	0.00
94	CHEDI ASBL		31/03/2004	20,400.00	3/02/2006	13,254.00	4/01/2007	16,839.00					50,493.00	
													0.00	
														0.00
														0.00
			Total	20,400.00	Total	13,254.00	Total	16,839.00	Total	0.00	Total	0.00	Total	0.00
95	CGCO		5/04/2004	11,050.00									11,050.00	
													0.00	
														0.00
														0.00
			Total	11,050.00	Total	0.00	Total	0.00	Total	0.00	Total	0.00	Total	0.00
96	UNISI		31/03/2004	63,750.00	3/02/2006	51,700.00	4/01/2007	42,416.00					157,866.00	
													0.00	
														0.00
														0.00
			Total	63,750.00	Total	51,700.00	Total	42,416.00	Total	0.00	Total	0.00	Total	0.00
97	ACUITY		5/04/2004	13,600.00									13,600.00	
													0.00	
														0.00
														0.00
			Total	13,600.00	Total	0.00	Total	0.00	Total	0.00	Total	0.00	Total	0.00
98	CISA			0.00	16/02/2006	10,200.00	4/01/2007	5,100.00					15,300.00	
													0.00	
														0.00
														0.00
			Total	0.00	Total	10,200.00	Total	5,100.00	Total	0.00	Total	0.00	Total	0.00

Part II			Distribution of the Community's prefinancing (or payment) between contractors according to the consortium decision(s) ⁽⁴⁾											
Contractor n°	Organisation Short Name	Country Code	Reporting Period 1		Reporting Period 2		Reporting Period 3		Reporting Period 4		Final payment		Total Amount (I) ⁽⁶⁾	
			Date(s) ⁽⁵⁾	Amount(s) (A) ⁽⁵⁾	Date(s) ⁽⁵⁾	Amount(s) (B) ⁽⁵⁾	Date(s) ⁽⁵⁾	Amount(s) (C) ⁽⁵⁾	Date(s) ⁽⁵⁾	Amount(s) (D) ⁽⁵⁾	Date(s) ⁽⁵⁾	Amount(s) (H) ⁽⁵⁾		
109	FORTH												0.00	
													0.00	
													0.00	
													0.00	
			Total	0.00	Total	0.00	Total	0.00	Total	0.00	Total	0.00	Total	0.00
110	HTI												0.00	
													0.00	
													0.00	
													0.00	
			Total	0.00	Total	0.00	Total	0.00	Total	0.00	Total	0.00	Total	0.00
Total (Y)			Total	2,539,529.00	Total	1,688,598.33	Total	2,256,972.84	Total	0.00	Total	0.00	Total	6,485,100.17

Part III		Difference between Community's prefinancing (or payment) sent to the coordinator and Total Distribution of the Community's prefinancing (or payment) between contractors according to the consortium decision(s) ⁽⁴⁾					
		Reporting Period 1	Reporting Period 2	Reporting Period 3	Reporting Period 4	Final payment	Total Amount
Community's prefinancing (or payment) not yet distributed between contractors (Z) ⁽⁷⁾		495,821.00	-157,118.94	-15,090.48	0.00	0.00	323,611.58

I certify that the information set out in this(these) form(s) is accurate and correct and agreed by all contractors.

Name ⁽⁸⁾	Surname ⁽⁸⁾	Date (dd/mm/yyyy)	Signature of the administrative official authorised to commit the organisation of the coordinator ⁽⁸⁾

Explanatory notes

(1): To be filled in only by the coordinator.

(2): Established in conformity with articles 4.2 and 6 of the contract.

(3): I) = (A) + (B) + (C) + (D) + (E) + (F) + (G) + (H)

(4): To be filled in only by the coordinator.

(5): Insert the dates (dd/mm/yyyy) and the amounts (x,xxx.xx€) transferred to a contractor (including the coordinator) for a reporting period. If there are more than one transfer to a contractor during a reporting period, identify each date and each relating transferred amount.

(6): I') = (A') + (B') + (C') + (D') + (E') + (F') + (G') + (H')

(7): Z) = (X) - (Y)

(8): One the following persons : authorised contact person or first or second administrative official authorised to sign the contract, as mentioned in your Contract Preparation Form (Form A2b)

--	--	--