



IST-2002- 507382

**EPOCH**

**Excellence in Processing Open  
Cultural Heritage**

Network of Excellence

Information Society Technologies

**D.2.14: Sustainable Projects and Enterprises**

Due date of deliverable: 12 June 2008

Actual submission date: 11 June 2008

Start date of project: 15/03/2004

Duration: 4 Years

Authors:

Andrew Grantham, Despina Kanellou (CENTRIM, UoB, Brighton, UK),

Karina Rodriguez-Echavarria (School of Computing and Information Sciences, UoB, Brighton, UK),

Halina Gottlieb, Christoffer Gottlieb (Interactive Institute, Stockholm, Sweden),

Jim McLoughlin, Jaime Kaminski, Babak Sodagar (Brighton Business School, UoB, Brighton, UK)

Brian Smith (European Association of Historic Towns and Regions, Norwich, UK)

Daniel Pletinckx (Visual Dimension bvba, Ename, Belgium)

<b>Project co-funded by the European Commission within the Sixth Framework Programme (2002-2006)</b>		
<b>Dissemination Level</b>		
<b>PU</b>	Public	X
<b>PP</b>	Restricted to other programme participants (including the Commission Services)	
<b>RE</b>	Restricted to a group specified by the consortium (including the Commission Services)	
<b>CO</b>	Confidential, only for members of the consortium (including the Commission Services)	

# Table of Contents

<b>Table of Contents .....</b>	<b>2</b>
<b>1 Executive Summary .....</b>	<b>4</b>
1.1 Introduction .....	4
1.2 Overview .....	5
1.3 Network value creation in Workpackage 2 .....	9
1.4 Structure of this deliverable.....	10
<b>2 Knowledge Transfer .....</b>	<b>11</b>
2.1 Knowhow Books .....	11
2.1.1 About the Knowhow Books series .....	11
2.1.2 Format .....	11
2.1.3 Titles.....	11
2.1.4 Content .....	14
2.1.5 Project Group .....	15
2.2 EPOCH Knowledge Bank .....	15
2.2.1 Introduction .....	15
2.2.2 Software Platform .....	15
2.2.3 Features .....	15
2.2.4 Project Group .....	16
<b>3 Business models.....</b>	<b>17</b>
3.1 Introduction .....	17
3.2 Brokerage models.....	18
3.2.1 First Line Consulting.....	18
3.2.2 Thematic Clusters.....	19
3.2.3 Interdisciplinary lab .....	19
3.2.4 Post-incubator .....	19
3.3 Knowledge and technology transfer models .....	20
3.3.1 Service based transfer model.....	20
3.3.2 Development based transfer model .....	21
3.3.3 Embedding .....	22
3.4 IPR issues for 3D content.....	22
<b>4 EPOCH Network of Expertise Centres as a mechanism for bridging the knowledge gap between Cultural Institutions and Information and Communication Technologies professionals</b>	<b>25</b>
4.1 Introduction .....	25
4.2 NoECs Concept, Methodology and Implementation.....	26
4.2.1 Learning Networks.....	27
4.2.2 Implementation of Expertise centres in CH: The Roadmap.....	29
4.2.3 NoECs templates defining structure, functionalities and criteria for Expertise Centres in CH+ICT32	
4.2.4 EPOCH NoECs: the model .....	36
4.3 Challenges and Lessons Learned.....	37
4.4 Discussion and Conclusion.....	40
<b>5 Socio-economic Impact Modelling .....</b>	<b>42</b>
5.1 Objectives.....	42
5.2 Introduction .....	42
5.3 Process.....	42
5.4 The set of models .....	43
5.4.1 Holistic site impact model.....	43
5.4.2 Holistic ICT investment and appraisal model .....	44
5.4.3 The HIT (Heritage Impact Training) toolkit .....	45
5.4.4 The City Model .....	46
5.4.5 Overview .....	47
5.5 Training .....	48

5.6	Dissemination.....	48
5.7	Continuation after EPOCH.....	49
<b>Appendix 1: ‘Towards a ‘City Model’ for heritage-led regeneration and tourism development’</b>		
.....		<b>50</b>
	Background .....	50
	City of Norwich – A Case Study.....	53
	Strategic Context .....	53
	City Vision.....	54
	Delivery Agencies – Strategies and Activities .....	55
<b>Cultural Services – Norwich City Council.....</b>		<b>55</b>
	Cultural Technology Strategy.....	58
	Impact and Evaluation .....	60
	Conclusions and future directions.....	61
<b>Appendix 2: Adoptions and applications of the model.....</b>		<b>63</b>
	Applications in Europe .....	63
	Applications outside Europe.....	63
	Taught courses known to include the model .....	63
	Other applications .....	63
<b>Appendix 3: Dissemination of socio-economic impact modelling through conferences .....</b>		<b>65</b>
<b>Appendix 4: Summary of feedback from the UNESCO/EPOCH socio-economic impact</b>		
<b>symposium, Paris, 17-18 January 2008.....</b>		<b>66</b>

# 1 Executive Summary

## 1.1 Introduction

Workpackage 2, as Integration Activities workpackage, contains several activities that try to improve and establish integration between the scientific partners involved in the application of ICT in cultural heritage and the other partners, which span a wide range of organisations from national and regional cultural heritage organisations over museums and governmental organisations to companies active in this domain. This integration is situated in a domain that still emerging and therefore needs to focus on the creation of “cultural technologies sector”. A sector has providers, technologies, customers, users, rules and regulations, business practices, a research community, quality measures etc. A lot of these elements are still in their infancy and definitely need a maturing process. Other elements suffer from the slow uptake and significant differences between the different fields that come together in this “cultural technologies sector”, from creative industries to ICT, from governmental organisations from local to international level to associations of volunteers, from mathematics based researchers in computer graphics to humanities based researchers in archaeology or historical research.

Integration in such an early stage is about transferring knowledge, about charting good ways to reach certain goals and to fit them with established policies, about cost effective solutions, sustainability and quality assurance, but first of all about creating *trust* in the use of ICT in cultural heritage. A recent study about the astonishing low level of the use of digital photography in archaeology proves this point very well. Although digital photography has clearly reached the mainstream market and is taken up successfully by the layman, it still has not reached proper take-up in archaeology, because of lack of smooth workflows, proven methodologies and trust.

In other words, integration in this field needs to focus on two tracks. On one hand, major efforts need to be made to *create trust* in these technologies, hence to *transfer knowledge* about correct and cost effective use of ICT in CH. This knowledge is not packaged in the right way today. Most information fits within an academic framework, where papers, research results, state-of-the-art, sound scientific methodology, publications, citations, etc are the key elements. This information is not suited for people that want to apply these technologies. Other information is too commercial or too technical to help informing the decision makers in a correct way and establishing this trust. The key audience for such information is the top and middle management of CH organisations. The information provided needs to fit with their needs and mention the feasibility of certain technologies, their impact on an organisation, the skills and budgets required, the expected outcomes and impacts.

On the other hand, early adopters that endeavour into practical application of ICT in CH projects need *support during the implementation process*, and the results of such early realisations and pilot projects need to be communicated to the wider CH community. This needs mechanisms that funnels the appropriate knowledge to the project when needed, and that record the positive and negative experiences in the project, so that they can be turned into best practices and comprehensive knowhow that can be disseminated amongst the CH community.

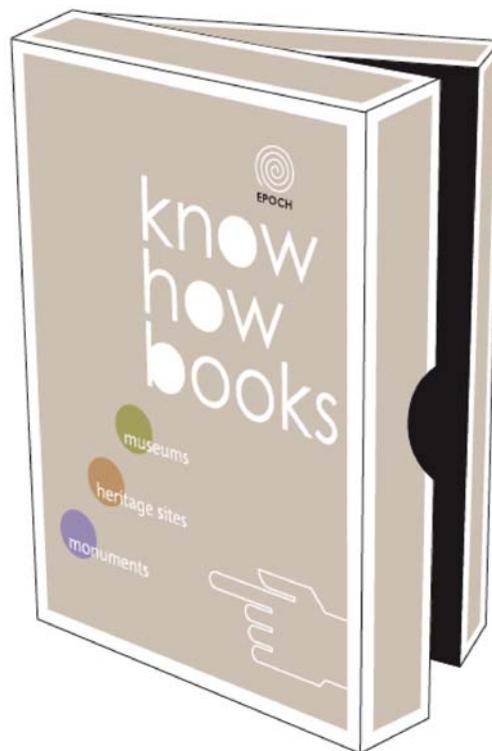
The activities in workpackage 2 have been focusing on both tracks, hence stimulating the integration of the different domains that come together when applying ICT to CH.

## 1.2 Overview

The four activities in workpackage 2 focus on those two tracks, i.e. creating trust by transferring practical project knowledge and supporting pilot projects and pioneering efforts to establish good examples and best practices.

The **Sector Watch activity** had the goal to turn the knowledge available in the EPOCH network - combined with the research that took place in previous periods in WP2 - into accessible publications on pilot projects and early implementations. To express this point of view better, these case studies have been renamed to “knowhow books”.

Based on a long list of about 25 potential knowhow books, a shortlist of 15 knowhow books, organised in 3 categories (heritage sites, monuments, museums) were selected, complemented with a volume on guidelines for cultural heritage professionals in the use of ICT. Through an extensive writing, editorial coaching and designing process, 10 knowhow books were produced and the museum volume of 5 knowhow books was printed in 500 copies.



*The museum Knowhow Books are offered in a printed form in a box*

The Knowhow Books were written by specialists in different areas, and validated through panels of experts. For the museum-based booklets, a panel of Swedish museum specialists was used. For the monument and heritage site booklets, a group of UNESCO related experts provided an in-depth review and feedback at a meeting in Paris. The Knowhow Book on tourism has been validated by a Dutch tourism expert.

The goals of these Knowhow Books are clearly to create trust amongst CH management and to provide a practical guidance for project implementation. The first goal is reached by starting the Knowhow Book with an extended executive summary that covers the background and the basic principles of the approach used, that briefly describes the implementation, expands on the impact on the stakeholders, the institutional framework and the benefits, and lists the technologies, the required competences and the resources needed in a one page

overview. The practical guidance can be found in the body of the text, that describes the workflow, the technologies used, the best practices and the future developments.

These Knowhow Books are distributed in printed form (museum booklets only) and in digital form (PDF) through a designated website.

Continuation of the creation of Knowhow Books in 2008 is planned through a Swedish project. The Network of Expertise has submitted also a European project proposal that plans continuation of this effort.

Another result of Sector Watch Activity was the development of a wiki-based Knowledge Base framework, which was taken on successfully, based on content that had been collated from within the network. This Knowledge Base is online through the EPOCH website and the her-IT-age.net website (<http://her-it-age.net/>) and fully suited for further continuous update by the expertise centres. This Knowledge Base will provide both a wide range of knowledge on ICT use in CH and links to online resources about and evaluations of projects in the field.

The Knowledge Base will be a crucial instrument in the knowledge transfer activities of the expertise centres in the first place, but will serve also for the whole CH community through registered login. The focus of the Knowledge Base is to provide information on the use of ICT rather than on the research issues, and collect information about results and outcomes of CH projects that use ICT. In this way, it complements the knowhow books.

Talks with the INTUITION network on cooperation concerning the Knowledge Bank have been held and will continue (both Knowledge Bases already use the same technology).

The focus of the **Research Agenda Activity** in period 4 was to provide a finalised Research Agenda. Major consultation was done of EPOCH and non-EPOCH experts, and a workshop at the VAST2007 conference in Brighton in November 2007 brought together several of those experts to discuss in a multidisciplinary way the provided input. Major input was provided by the socio-economic impact team and important sections were added on business mechanisms, product life cycle, maturity and adoption levels of ICT in cultural heritage. A full section on socio-economic impact modelling was added.

The Research Agenda lists also a major set of *recommendations* for six domains, providing a guiding role for research in the cultural heritage and ICT domain in the coming years.

The Research Agenda will act as a reference document for the long term development of the sector, while the other activities in WP2 rather focus on the short term development of the sector. A plan for maintaining the Research Agenda has been incorporated in above mentioned European project proposal (see also below concerning the thematic clusters).

In period 4, the research of the **Socio-economic Impact Modelling** team focused on the development of *training programmes and materials*, on delivering actual training courses, on dissemination and on further development of the *impact models*.

Besides further refinement of the holistic and ICT investment impact models, a newly developed prototype city model and local development model was added, which further complements the multilevel impact modelling approach that was taken in this activity. Further developments were made on the toolkit and on the practical application of the model in real projects and in the context of social enterprises, and training sessions were organised on different levels and for different audiences.

Socio-economic impact modelling is a key element in the creation of trust in using ICT in CH. It holistic approach allows to have a well documented workflow to outline, predict or

measure how CH projects impact their environment and the involved population, hence to consult policy makers, inform the local population or underpin decisions when important CH related investments need to be made. As the model is very versatile (including now also a modelling tool for cities) and having specific ICT investment modules, it can play a paramount role in the support of the implementation of ICT based projects in CH. Although the model has gone through a lot of case study testing, it is new and needs full-blown projects to be tested on. A first project in Belgium is already in its first stage. Training material has been prepared and training sessions have been held to prepare this innovative piece of research for operational use in the very near future.

The **Brokerage Schemes Activity** was focused on supporting the Network of Expertise effort. The major efforts in this activity were concentrated on the creation and support of *thematic clusters* and on the description of *business models* that support knowledge and technology transfer for SMEs.

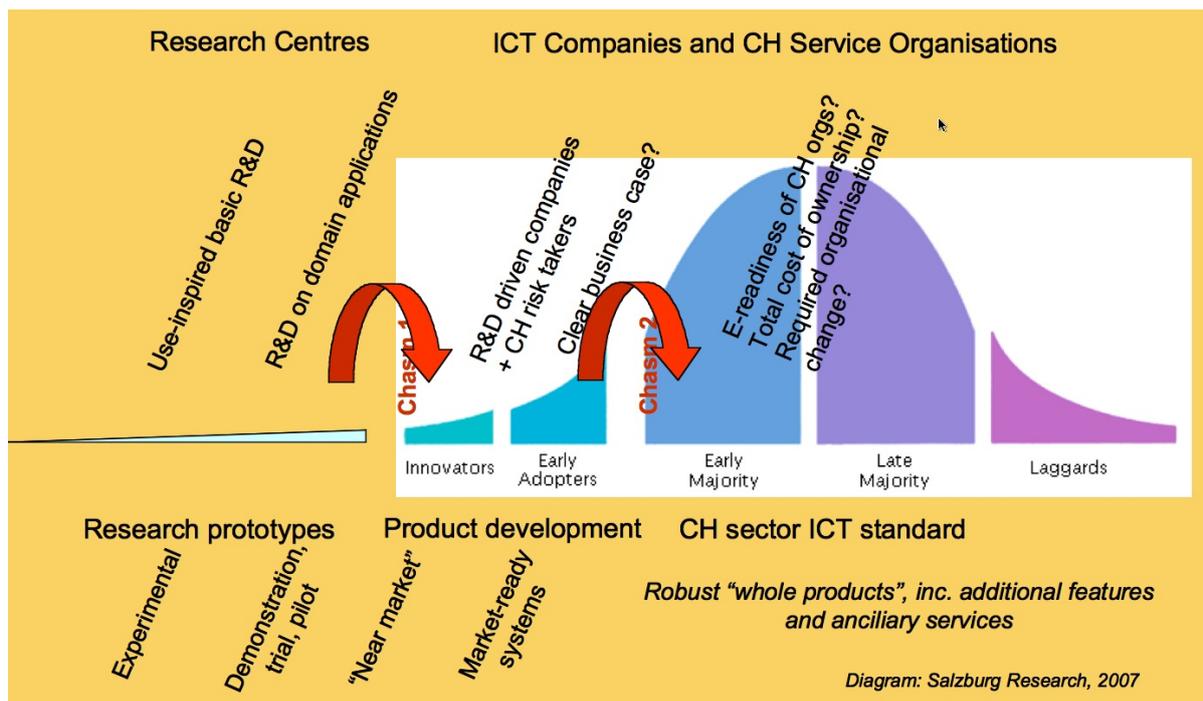
*Thematic clusters* are regular, international meetings (once or twice a year) of CH professionals, ICT researchers and SMEs concerning a certain domain. In the Brokerage Activity, we have already started clusters on Location Based Services, on Archaeological Information Systems, on Serious Gaming and on 3D Content. The aim is to make a mix of presentations that both show research projects and results of CH projects that use that specific technology, and to discuss the further development and application of that technology. In 2007, we published for example the presentations of such a meeting on Location Based Services.

Another important aspect of the Brokerage Activity is the development of *business models* to support uptake, including an analysis of IPR issues for 3D models derived from images through the ARC3D software (one of the EPOCH tools of the Common Infrastructure).

The strategy behind this uptake is twofold. On one hand, we need to reach early adopters, CH management and the younger generation to stimulate the adoption of new technologies, to layout business models and workflows and to create successful pilot projects and best practice descriptions. Once these are available, they need to be disseminated to the wider CH community (through the expertise centers and other channels) to create a pull mechanism instead of the push mechanism that is common today. In other words, ICT in CH will only be successful if the sector itself gets convinced about the added value of ICT. This strategy beats the double chasm problem (see below) when adopting new technologies.

These technologies need to show their capabilities in pilot projects, need to demonstrate their added value through implementation by early adopters, and need to define workflows and appropriate methodology through involvement of SMEs and innovators in the CH domain. In this way, the first chasm is beaten and this process is supported by training and brokerage.

Once such take-up has been realised, this needs dissemination to the wider CH community to communicate the opportunities, advantages (and disadvantages) and best practices. This dissemination is supported by the *knowledge base* and *Knowhow Books*. The *thematic clusters* sit – so to speak – between the two chasms, they look at early adoptions of certain technologies, disseminate the results and best practices to the wider CH community (bridging the second chasm) but also look at the ongoing research and upcoming products and technologies (bridging the first chasm).



*The double chasm problem of adoption of new technologies (see Research Agenda)*

The business models describe ways to involve SMEs in this process, and especially in the bridging of chasm 1. By creating a framework in which SMEs can take up research results and develop a business (we have added also a section on IPR), we can stimulate the introduction of new technologies or methodologies or improve existing workflows.

The **Encouragement of SME Involvement Activity** 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 partners in this activity have worked on defining and testing the different aspects of creating a Network of Expertise and have evaluated the ongoing activities of the operational expertise centres. Candidate centres have received training and support in holding a start-up meeting.

An important outcome of the activity was the Creation of methodological guidelines for the creation and operational aspects of the Network of Expertise. An important aspect of that is the creation of a strategy for continuous monitoring and updating of the stakeholder needs through a “thematic cluster” approach, which allows to demonstrate the state-of-the-art, present related projects, product offerings and developments and monitor the evolving needs of the sector for one specific domain. Thematic cluster meetings are held once or twice a year and differ from existing conferences in several aspects: they are focused on knowledge transfer and practical application, not on academic publications, they focus on one specific domain in all its aspects and they bring together researchers, users and solution providers.

Another focus of the activity was making CH experts, and especially CH managers, aware about the opportunities and possibilities of the use of ICT in cultural heritage, as we still see a slow take up of existing technologies and a poor understanding of emerging technologies. This knowledge transfer has been tested through two approaches. The first approach is the

creation of knowhow books (see above), the second is the creation of a training strategy that offers knowledge on three levels: management, seminar and hands-on level. This means that a certain package of knowledge is made available through three different kinds of training sessions. A management training session targets upper management, takes 1 – 2 hours and deals with the concepts, the impact of the presented technology/methodology on the organisation, the competencies, budgets and time spans required to implement. A seminar level training takes half a day to a day, targets middle management and cultural heritage experts and focuses more on the opportunities and workflow of the technology/methodology. A hands-on level training takes 3 to 5 days, targets cultural heritage staff and focuses on mastering the presented technology/methodology and its associated workflow in detail.

So, one of the future activities of the Network of Expertise will be providing these training packages in the different levels (management and seminar level need to be provided locally by the expertise centres in the local language, hands-on training will be provided centrally in one, maybe two languages, at a fully equipped venue, that can be considered as a central heritage technology training centre). Training will cover both technical and non-technical subjects (such as innovation management, socio-economic impact modelling, ...).

This training concept is complemented by knowhow books that present the advantages and limitations of certain technologies when implemented in a certain CH domain, and act as introduction to the training packages. For example, the knowhow book “The ARC3D Webservice - How to turn images of an object or scene into 3D models for exhibitions and archives” shows the potential use of this software for the museum and archive domain and complemented the training sessions that have been giving during period 3 and 4.

### **1.3 Network value creation in Workpackage 2**

The WP2 Activities all aim to create a system that allows to support the use of ICT in CH on a European level in a scalable and sustainable way.

These activities have defined, tested and started a framework, called the *Network of Expertise her-IT-age.net*, that is linked to the local cultural structures within Europe and that gets most of its funding through this local level. European funding will be pursued to define and start such a network, but a combination of this local funding and membership and event fees collected by the network are expected to maintain this structure in the longer term.

Through close cooperation with other networks and projects, her-IT-age.net seeks to act as a *delivery channel* for ICT knowledge and technology for the CH domain, as it is based on an extensive network of local partners.

The Sector Watch activities during the project have provided major insight in the sector and have resulted in a well-defined activity of creating *Knowhow Books*, which are a major channel of knowledge transfer towards the CH sector.

These booklets are complemented by *training sessions* that deepen the understanding and mastering of a certain subject for different types of audiences (management of CH organisations and policy makers, CH professionals, SMEs).

By creating *thematic clusters*, early adopters of certain technologies are supported and the results are communicated to the wider CH domain. A close link is created with the ongoing research in a certain technology or domain, and a continuous updating of the short term and long term expectations of the sector is established.

By establishing several types of *brokerage* (first line consulting, interdisciplinary lab, incubators), pilot projects are supported, workflows and best practices are established and technology transfer to SMEs is organised.

The expertise centres, that organise these activities, are also a major driving force behind a sector wide *Knowledge Base* that is open for use and input to all registered, professional users in the CH+IT domain.

*Socio-economic impact modelling* and *innovation management* (as established in the learning clusters of the expertise centres) are major research results, originating from EPOCH, that will underpin the use of ICT in real world CH projects.

Through these elements, Workpackage 2 has a real potential to make a lasting contribution to the Cultural Heritage sector.

#### **1.4 Structure of this deliverable**

As already highlighted by this summary, this deliverable provides four contributions.

Chapter 2 provides more information on the knowhow books and the Knowledge Base.

Chapter 3 provides an overview of the business models developed in the Brokerage Schemes activity.

Chapter 4 gives the final results on the definition and establishment of the Network of Expertise, as developed in the Encouragement of SME Involvement activity.

Chapter 5 finally gives an overview of the socio-economic impact modelling activities with the city model as appendix 1.

The figures are numbered per chapter.

## **2 Knowledge Transfer**

### **2.1 Knowhow Books**

#### **2.1.1 About the Knowhow Books series**

Developed by EPOCH partners, the Knowhow Books series is a collection of practical descriptions of the design, development and implementation of a number of projects using ICT for the recording, display and interpretation of cultural heritage. The series debuted in the spring of 2008 with both a limited printed and complete electronic editions.

The target group for the publications includes museum managers, exhibition producers/curators, and museum pedagogues and professionals working with digital restoration as well as those working with communication and audiences.

Hence the publications are not to be considered research publications, they are rather meant to work as the bridge from research findings to the everyday practice for people working in the cultural heritage sector. The purpose of the Knowhow Book series is to inspire and to give practical and concrete insight into the implementation of a number of productions. Even though several of the projects have been produced in a research context or environment, it is important that the structure, the language and the design of the Knowhow Books takes it a step further using a lot of illustrations presenting the content in a light and interesting way.

#### **2.1.2 Format**

As a starting point for the Knowhow Book series, we used the existing EPOCH scenarios, the structure upon which they are based, and the discussions held around this part of the EPOCH project. As mentioned before, the difference from the scenario descriptions lay in the practical and concrete approach and the focus on the description of the design, development and implementation. In other words, the texts starts from an existing need in cultural heritage practice and shows how ICT can provide operational and suitable solutions to this need.

In total 10 booklets have been produced. The editorial team selected the projects and divided them thematically into three different categories: MUSEUMS, HERITAGE SITES and MONUMENTS. The booklets in the MUSEUMS series are been gathered in a designed digibox (a paper box similar to those used for DVDs). Each booklet is in 4-colour print and contains between 20 and 36 pages (based on a text of 10 to 20 A4 pages) and has been published in an edition of 300 copies. The entire Knowhow Books series has been published electronically as PDFs, available to order from the EPOCH or Knowhow Books website (<http://www.tii.se/knowhow/>).

#### **2.1.3 Titles**

The following titles have been produced.

##### ***Electro Bacchanalia – a peep box and an interpretive tool for Old Masters’ paintings***

*Authors: Geska Helena Andersson, Robert Brecevic, Halina Gottlieb and David Nilsson.*

By creating a flirtatious link to contemporary lifestyles, Electro Bacchanalia stimulates visitors’ interests in the motif of an Old Master’s painting within a unique museum installation. Incorporating the aesthetics of the traditional peep show, Electro Bacchanalia transforms this vision into a modern experience. In place of the still images and objects used in historical peep boxes, the painting is brought to life through technology based on video composites and sensor input.

### ***Interactive Storytelling Exhibition - How to produce a virtual interactive story to engage visitors with the real world***

*Author: Michael Danks*

By devising a virtual adventure story with accessible characters, the Brighton Fishing Museum presents an enticing example of how to engage young visitors using an interactive storytelling exhibition. The visitors' personalised journey takes them through every corner of the museum, encouraging them to explore key points in local history. The intuitive games within the interactive storytelling exhibition lead the visitors to hunt for information provided in the various museum exhibits, bringing to life the traditional displays in their environment.

### ***Virtex - A multisensory approach for exhibiting valuable objects***

*Author: Daniel Pletinckx*

At a time when museums are under increasing pressure to both show their valuable artefacts more widely, as well as safeguarding them, with the associated high costs, VIRTEX offers an ideal solution. By creating digitally enhanced replicas of their precious art objects, museums can allow visitors to have a truly hands on experience, increasing access to the objects and adding virtual information feeds to the user experience. VIRTEX allows museums to transform their artefacts into accessible, distributable and reproducible exhibits.

### ***The ARC 3D Webservice - How to turn images of an object or scene into 3D models for exhibitions and archives***

*Authors: David Nilsson, Daniel Pletinckx, Luc Van Gool and Maarten Vergauwen*

The cultural heritage community has always had a keen interest in the creation of 3D models of objects, monuments, scenes, etc. Such models not only help in creating a more vivid picture of the past in the mind of the general public, but they are also of great value for training and research within the field. The ARC 3D Webservice enables its users to transform images of scenes or objects into 3D models that enhance the experience of both current and archived collections.

### ***Touch of Kandinsky - How to make a carpet into an interactive or storytelling tool***

*Authors: Halina Gottlieb and David Nilsson*

Touch of Kandinsky, an interactive tool in the form of a carpet with the motif of a painting, can be a playful complement to art galleries, which often challenge visitors' perceptions. By encouraging visitors to interact with the motif on the carpet, the museum can enrich the experience of abstract art for both grown-ups and children alike. The carpet can be an important addition to the arranged curator-led activities in the gallery, offering an area for self-directed exploration. Attracting the visitor's attention to the other paintings, the carpet can stimulate communication between visitors, sharing the experience of their simultaneous exploration.

## ***How can ICT support cultural heritage? - Basic Guidelines for Cultural Heritage Professionals in the Use of Information Technologies***

*Authors: Tamara Brizard, Willem Derde and Neil Silberman*

The watchwords for the future of heritage are place, network, memory, identity and communication. ICT can provide the context and tools for these new approaches to heritage not merely by recording, data processing and visualisation, but by helping to shape the meaning and direction of the entire enterprise. Working closely together to address the basic themes highlighted in this booklet, and illustrated by the projects described in the other booklets of the Knowhow books series, digital technologists and cultural heritage professionals can effectively integrate research questions, heritage objectives, and emerging technologies to create more inclusive, sustainable and meaningful methods of preserving and reflecting on the past.

## ***Interactive Landscapes - How to read and understand historical landscapes***

*Author: Daniel Pletinckx*

The human influence in our European landscapes is quite significant. Interactive and explorative applications help us read the landscape and understand the historical processes that shaped our current landscapes. From the historical data on a landscape, we can make visualisations for several time periods. New software developments allow us to match these visualisations with the landscape of today. In addition to presenting an innovative user interface, this Knowhow booklet describes the methodology and techniques required to make an interactive visualisation of the current landscape in a cost-efficient way, and to relate this landscape to reconstructed landscapes of the past.

## ***Interpretation Management - How to make sustainable visualisations of the past***

*Author: Daniel Pletinckx*

Current technology allows us to easily create three-dimensional models of landscapes and manmade structures and to visualise these models in several interactive and non-interactive ways. However, our knowledge of the past is partial and uncertain. In fact, we are not able to reconstruct the past at all, but we can try to puzzle together all of the information we have about a certain structure in a certain time period, and try to visualise this information in the best possible way. This Knowhow booklet explains the methodology for doing this in a correct and reproducible way. We explain and illustrate methods such as source assessment, source correlation and hypothesis trees, which help to structure and document the transformation process from source material to 3D visualisation. We also discuss the different approaches of 3D visualisation in research and in public presentations, and present a tool to manage the interpretation process.

## ***Presenting The Hidden Past - Highlights and impressions from the lowlands***

*Authors: Jan Stobbe and Daniel Pletinckx*

The region Kop van Noord-Holland in the Netherlands shows a remarkable variety of landscapes. The area consists of a combination of various natural structures, such as dunes and Pleistocene deposits, and man-made landscapes, such as polders. Part of the area contains vast quantities of important prehistoric remains, both cultural and natural. The cultural remains are not visible or recognisable in the landscape, and the natural remains are visible on site, but need support to be understood and appreciated. This Knowhow booklet deals with

practical ICT solutions for supporting heritage in the tourism domain and helping to create new tourism destinations in the Kop van Noord-Holland region. The suggested developments are based on the Tourism Marketing Framework of the region and can be used as inspiration for other regions hoping to build on their tourism offerings.

### ***Monitoring Monuments - A low-cost digital early warning system for preventive conservation of built heritage***

*Authors: Mario Santana Quintero, Anouk Stulens, Alonzo C. Addison and Daniel Pletinckx*

Without preventive maintenance, small problems at monuments and buildings can quickly grow into critical issues. Monitoring is crucial for preventive conservation, but often overlooked for lack of a simple, straightforward process. Using low-cost digital tools, and building upon more than fifteen years of experience of Monument Watch of Flanders, this Knowhow booklet outlines a practical, easily replicable process for keeping an eye on buildings and monuments. This approach makes use of simple computer field collection forms, digital photography, and databases to appropriately and systematically monitor and maintain heritage places. Both the well-tested monitoring process and the operational structure of this innovative Belgian not-for-profit are explained in order to help others learn from their success.

#### **2.1.4 Content**

The text is quite freely disposed as each project is very different from each another, therefore subtitles are written in a way that evokes the interest of the reader, rather than following a strict template. Thus, the purpose of the ‘template’ below acted as a guiding principle – content could be added or subtracted depending on the project described. Parts 1-3 and 5-6 were kept relatively short, allowing section 4 to give a more detailed account of the methodology, workflow and implementation.

##### ***1. Rationale/Summary/Abstract***

Summary/abstract text. Light and interesting (like the intro to a magazine article) to use both on the back cover of the booklet and/or as introduction in the booklet. In other words, what was the need and how was it solved by the project described.

##### ***2. Introduction/ Background***

In short: how the project came to be, what needs does it fulfil within the heritage sector, what competencies are involved in the project.

##### ***3. Description of the Project***

Description of the project, how it works, how the needs were solved, where it has been originally implemented.

##### ***4. Methodology, Workflow and Implementation***

Being the main part of the booklet, this section provides hands-on, concrete description of how the project was carried out. Each development phase is clearly described, along with the selection process (why and when is this technology a good solution to the need/problem), standardisation (when relevant) and ideas for implementation (description how the project is implemented, or could be in cases where it has not yet been implemented).

## **5. Benefits**

Describes the benefits, drawbacks and/or limitations of the described implementation.

## **6. Summary**

Short summary of the described implementation.

## **7. Graphic Overview**

This is a “quick overview” of the project, borrowing inspiration from Siravo’s “City Inventories” cookbook. The overview has been created by the designer for each project, and follows a predefined template: summary, technology/interaction, required competencies, ideas for implementation, resources.

### **2.1.5 Project Group**

Coordinator: Halina Gottlieb

Project Managers: Geska Helena Andersson, Kristi Wilson

Editing Group: Daniel Pletinckx, Geska Helena Andersson, Halina Gottlieb, Kristi Wilson

Authors: Geska Helena Andersson, Robert Brecevic, Halina Gottlieb, David Nilsson, Michael Danks, Daniel Pletinckx, Luc Van Gool, Maarten Vergauwen, Tamara Brizard, Willem Derde, Neil Silberman, Jan Stobbe, Mario Santana Quintero, Anouk Stulens, Alonzo C. Addison

Graphic Design: Rafal Sosin

## **2.2 EPOCH Knowledge Bank**

### **2.2.1 Introduction**

The her-IT-age.net Knowledge Bank has been designed, assembled and started under the EPOCH project, and is targeted towards all Cultural Heritage professionals that are interested in the correct and efficient use of ICT. Her-IT-age.net is the Network of Expertise that will support professionals in Cultural Heritage (CH) both on a regional level through local expertise centres and on an international level through her-IT-age.net itself. This Knowledge Bank is organised as a standard wiki to allow all professionals to contribute to this expertise, and more specifically to give a platform for the expertise centres to find and provide expertise in the CH+ICT domain.

### **2.2.2 Software Platform**

The MediaWiki ([www.mediawiki.org](http://www.mediawiki.org)) wiki software has been identified as a suitable platform to power the EPOCH wiki. It has been installed on the Interactive Institute’s web server and is written in PHP with a MySQL backend.

### **2.2.3 Features**

The platform houses a rich set of feature of which the following are most relevant to this project:

- Wiki – collaborative document system with versioning.
- User package – manages user accounts and permissions.
- Calendar – calendar extension to keep track of conferences, workshops and other current events.
- Categories (or Tags) – classification of content

- Search function
- GUI editor – editing of content will require minimal if no knowledge of wiki markup.
- Attachments – editors can attach files to wiki pages

An extension, Semantic Mediawiki, was installed and configured on top of wikimedia – the wiki platform used for EPOCH Knowledge Bank. It allows the tagging of semantic information to wiki content and will improve search and navigation capabilities with little additional wiki markup.

Semantic Forms, another extension, provides functionality to easily create forms which users can use when adding content with minimal knowledge of semantic wiki markup.

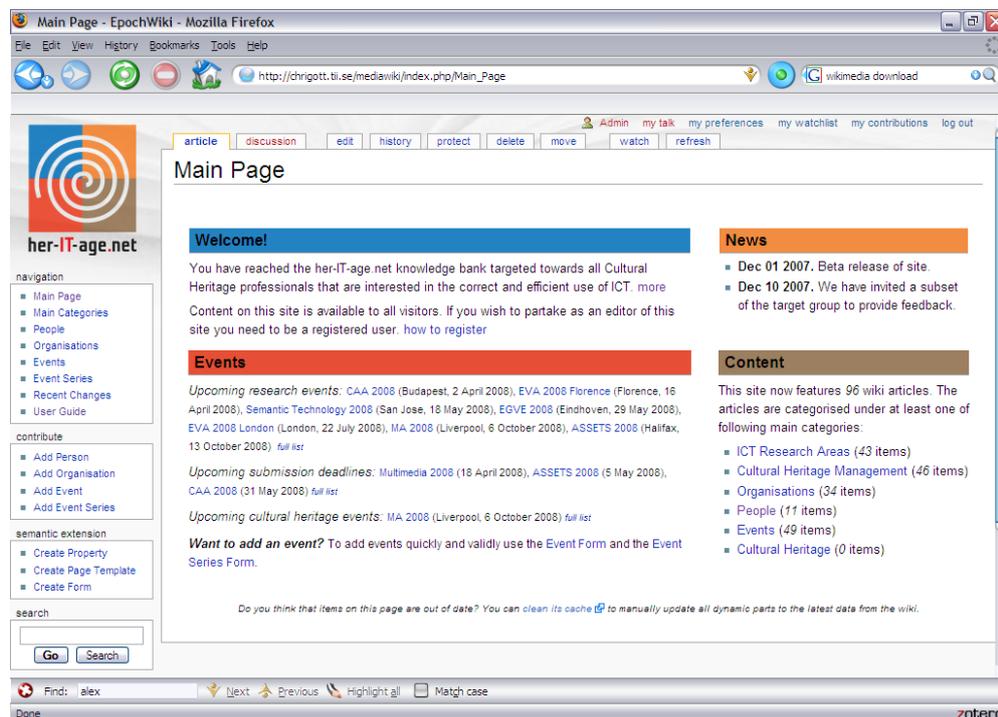
The structure of content has been defined and embedded into the site in the form of page categories, templates and semantic properties.

Four page creation forms (General, Person, Event, Organisation) have been created and will allow users to fill out page templates quickly and with minimal knowledge of wiki markup.

Page templates have been enriched with decorative layout tables that will improve page layouts without encumbering users with any additional work.

The main page and sidebar have been fleshed out with entry points to the site’s content.

Some of the initial content has been added to the site, primarily to test site functionality.



The EPOCH Knowledge Base can be reached from the EPOCH website, from the TII webpage <http://www.tii.se/her-IT-age/> and from the her-IT-age.net website.

## 2.2.4 Project Group

Project supervisor: Halina Gottlieb

Site administration & Development: Christoffer Gottlieb

Server administration: Alex Bustamante & David Jonsson.

## 3 Business models

### 3.1 Introduction

Cultural heritage institutions provide services that enhance civic engagement, cultural identification and cultural enrichment. They collect, preserve, research and curate cultural artefacts and enable access to important historical sites and information. The value of these institutions to society is such that many are supported directly by states, and even private collections are frequently subsidised by public funds or private donations. Their status has created a dependence on public funding, which necessitates different levels of renegotiation and redefinition whenever these organisations want to institute changes. Changes and innovations related to science and technology are requiring changes to their organisational models, policies and public outreach. In the case of CH institutions, there are many stakeholders that need to be considered and among whom consensus must be achieved. The models, policies and other professional assumptions and ethics that regulated the analogue era, with its time and space constraints, are no longer applicable to the digital world. New business models and cultural and legal policies are being introduced that are affecting behaviours and values at regional and national levels. New technologies are promoting major organisational challenges and opportunities in the CH sector.

In other words, introducing new technologies is not only about technology. To help to cope with these challenges and opportunities, it is important to also introduce knowledge about innovation and change management, to stimulate debate about these issues and to disseminate successful organisational changes and projects. This needs to be done through a combination of training, meetings and publications. For example, the EPOCH knowhow books pay attention to these issues by listing required competencies, by analysing the impact on the involved stakeholders, by listing benefits and disadvantages and by distinguishing between processes that can be embedded in cultural heritage institutions and processes that rather should be commissioned to specialised companies.

Therefore we are convinced that successful introduction of digital technologies in cultural heritage relies on three elements: mastering organisational change, finding and using the best partners and technologies and supporting a maturing cycle of the current technologies. The business models that we developed for the Network of Expertise rely on these three elements.

The first element is a definite *focus on innovation and change management*, next to the necessary focus on technology. This will be reflected in the training offering, in the general structure of publications and meetings and in the required skills of the Expertise Centre teams in the future development and deployment of the network of Expertise. This has been reflected already in the EPOCH activities in general and in the Network of Expertise activities in particular, revealing that there is substantial knowledge available within the EPOCH network about these issues, which will be of paramount importance in the planned implementation in the Network of Expertise.

The second element is bringing together the right skills, people and technologies where needed. Too many projects are still too technology driven, resulting in poor usability, inadequate user experiences and excessive costs. Therefore we believe that an efficient *brokerage service*, that matches the required expertise, people and technology in an elegant and optimal way, is crucial.

Hence, the brokerage activity within the Network of Expertise will focus on stimulating cooperation by bringing together the appropriate people, skills and equipment. This activity relies on the Expertise Centre members, the research and technology partners, an extensive

database of SMEs, practitioners and experts in the field of new technology for CH and cooperation with existing organisations engaged in similar activities, to exchange member information.

We will further expand on this brokerage activity in the paragraphs on “Brokerage models”. We think that a set of brokerage services to support the Expertise Centres should include:

- First-line consulting
- Thematic clusters
- Interdisciplinary lab
- Post-incubator service

The third element is *mastering the maturing cycle of technologies* that are used in cultural heritage, in other words to create a graceful and efficient transition from research and emerging technologies to operational, reliable and suitable technologies. This has two components: the knowledge that is available in the research environment or the industrial environment that creates a new technology needs to be transferred to the CH domain, and the technology itself needs to be translated to a mature product that is fit for purpose. This is established through knowledge and technology transfer activities.

These activities will design, deploy and test experimental methods to collaborate in the building of joint projects and to transfer technology and research results to SMEs and the CH community in general. This is key to the uptake of new technology developed through basic and applied research. SMEs are being targeted as much of the technology (and especially the more innovative and complex tools) developed in universities and research centres, is immature and lacks the features that would allow it to be directly used within the CH domain. We will expand on this in the paragraphs on “Knowledge and technology transfer models” below. We propose the following activities:

- Service based transfer
- Development based transfer
- Embedding

## **3.2 Brokerage models**

### **3.2.1 First Line Consulting**

This brokerage service will provide advice about possible orientations for a new project, in the form of solutions that fit with the needs of the project initiator, that are cost efficient and sustainable and that can exploit new technology effectively and appropriately. These proposals will be formulated independently of companies or brands and will comprise SWOT – Strengths, Weaknesses, Opportunities, Threats - analysis, proposed solutions and a first estimate of their cost and implementation implications.

First-line consulting in most cases requires a multidisciplinary approach, and is not technology driven. It will generally result in a study phase to explore the proposed solution(s) and prepare for the tender or commissioning phase. In the case that the first line consulting is sufficient on its own, tendering and commissioning can immediately proceed based on the solution identified.

First-line consultancy will be implemented in each of the Expertise Centres. This will allow CH institutions in the region or members of the Expertise Centre to consult the Centre moderator, who will decide whether the necessary knowledge resides within the Expertise

Centre or to bring in a consultant. The Expertise Centres will rely on a pool of potential first-line consultants within the Expertise Centre network who will be identified at the start of the service. Feedback will be provided in order to determine whether the service is fulfilling its purpose.

### **3.2.2 Thematic Clusters**

At the international level, anyone interested or involved in a certain technology or CH domain (e.g. archaeological information systems, documentation digitisation, preservation and restoration of monuments, etc.) can become part of a thematic cluster. Theme-based meetings will be held once or twice yearly to enable communication within the thematic cluster. Internet based communication mediums will be provided in the form of a moderated forum, a thematic wiki as part of the knowledge bank, and a mailing list.

The meetings will be a mix of presentations on new technologies, product solutions or project results and general exchanges of ideas. The themes for the meetings will be based on the results of a survey among Host Networks, conducted during the first six months of the project. The results of the meetings will be produced as thematic publications and will be incorporated in the knowledge bank and in the quarterly newsletters.

The results will also be used to update the EPOCH Research Agenda on a continuous basis.

### **3.2.3 Interdisciplinary lab**

Successful implementation of ICT based public presentation projects in CH always need three different kinds of partners: ICT experts, creative specialists and CH professionals. To streamline the cooperation between those different skills and to explore new design possibilities for museums, site, landscapes and monuments, an interdisciplinary lab is established in the form of workshops. The results of these workshops are improved existing concepts or new, innovative setups that can be implemented at partners within the Network of Expertise.

The workshops are designed centrally but are implemented locally at the Expertise Centres to work with local partners and adapt to local customs, structures and memory institutions that can host the resulting concepts.

In this way, we try to stimulate innovation in this field, not only through the introduction of ICT but also through the cross-fertilisation between the three domains that should yield additional non-technical innovation and higher quality.

The brokerage aspect of this activity is to find the appropriate set of partners to organise and support a well balanced interdisciplinary activity and try to liaise the results with CH institutions that want to embrace the resulting concepts and have them implemented in projects. We want to run this interdisciplinary lab in one Expertise Centre and export it to the other Expertise Centres after evaluation of this first implementation. This activity relies on the central coordination organisation for identifying the appropriate partners.

### **3.2.4 Post-incubator**

We also want to support companies - in particular SMEs - that have certain skills in creative industries or ICT, to expand their business into the cultural heritage domain (the activity is called post-incubator because it does not create new companies but helps existing companies to improve and expand their business). This support consists of a flexible and creative workspace, where they can design and develop projects, supported by training, professional assistance, workshops and seminars.

Access to a large network of other experts and complementary competencies helps to focus on their own competencies and materialize this in the realisation of projects in cooperation with those third parties. The central coordination organisation of the Network of Expertise will also try to provide potential projects at partner institutions where the SME can actively use the acquired competencies.

### **3.3 Knowledge and technology transfer models**

The key issue in trying to turn a research project into a technology that can be used actively in cultural heritage projects is the switch from a research environment to a product development environment, which could be a company or a university spinoff. ICT specialists sometimes claim that the development cycle of a technology represents 20 % of the effort while the product development takes 80 %. Although it can be discussed if these numbers really hold for ICT applications in cultural heritage (for example, the ARC3D software has had already more than 10 years of development), the issue remains that the product development stage represents a major amount of resources, while the income generated in this stage by the still immature product can be small to non-existent.

As the cultural heritage domain is a slow and small market, the issue how to survive this product development stage becomes even more difficult and poses a major barrier in turning research projects into mature products. In practice, we see many splendid technologies lingering in the research phase and fading away because the product development stage for the cultural heritage market is considered too risky.

Therefore we propose three models that help to overcome this barrier and that we hope to implement in the Network of Expertise in the near future.

#### **3.3.1 Service based transfer model**

When turning a research project into a product, one is faced with several competing processes. First of all, the product needs to be marketed, which boils down to writing articles and giving interviews, making demo material, websites and promotional material, giving tons of demonstrations to potential customers, exhibiting at trade shows and following up the contacts with potential customers. Secondly, the product needs to be fine-tuned in performance, in look, in user interface, in use of industry standards, in interfacing to other products. Thirdly, it needs to be debugged to much higher standards than applicable in research environments. Finally, and most important, it needs to fit in the workflow that customers envision when using this product. The latter causes nearly always important development of extra features or major rewrites of the software to adapt to new workflows that were not envisioned in the development stage. All these efforts typically happen before the product generates any income, so major resources such as venture capital and excellent (hence expensive) staff are needed. Once the product is out on the market, the startup company is typically bombarded with bug reports, change requests and demands for upgrades.

This can be a too high hurdle to take for a small and slow market as cultural heritage. Therefore we propose to introduce an intermediate stage, where only services are provided but where the actual product development is running in the background.

We propose to create a small pool of SMEs that use the technology as part of their commercial offering of services (for example, instead of offering a product for innovative 3D digitisation, these SMEs offer digitisation services). By training these SMEs, they will be able to master the technology despite its shortcomings and they will be able to integrate the technology in their workflow by combining it with other tools. By interacting with the

market, these SMEs will come up with optimised workflows and a clear definition of the market requirements.

This approach has major advantages. First of all, the business intelligence, market base and technical knowhow of the SMEs provide an environment where the new technology can be applied (nearly) immediately. This produces projects and results that can be used as marketing material and references for the technology developer without additional overhead. The skills and knowhow of the SMEs in their specific market segment (for example 3D digitisation) allow to create an efficient workflow for the new technology, complemented by other tools to cover missing functionality. It also produces substantial feedback from the market on the quality and potential of the new technology, hence provides a definition how the mature product should look like.

The technology provider on the other hand only needs to deal with a limited number of SMEs concerning bug fixes and change requests. By working with a limited number of specialised people at the SMEs, these interactions can be very efficient and productive. In this way, the technology provider can concentrate all available resources on the product development, based on the product definition that is gathered by the SME pool.

As soon as the new technology can be used in real projects, a fee can be charged to those projects (a new technology should give a clear advantage in cost or quality, so using this new technology should give enough financial room for a use fee to be charged). As each use of the new technology hence produces a certain income for the technology provider, less additional resources such as venture capital are needed during the product development stage. This approach is also a win-win situation for the SMEs. By using the new technology, they can make more interesting commercial offers (but they return a part of that advantage to the technology provider).

After some time, the technology provider will have a product that is ready for the market, but much less resources are needed to reach that stage. The SMEs can further act as an installed base and alpha- or beta-testers for further product releases and continue to use the product under very interesting conditions.

### **3.3.2 Development based transfer model**

Another approach for making the product development stage more feasible in difficult markets such as cultural heritage is combining research with (a part of) the product development stage. This is for example done in IBBT-projects in Flanders, and works very well if the technology has an important immaterial component (hence consists mainly of knowledge).

The SMEs in such projects take their own technology and implement new functionality on these platforms based upon detailed knowledge provided by the research providers. In this way, not the technology of the research provider is used, but an existing product is injected with the knowledge that is extracted from the research provider.

Let's give an example. Suppose that a university developed new algorithms to provide accurate position localisation inside buildings based upon wireless LAN signals, and another research centre developed software to have social interaction between museum visitors through PDAs. An SME, that has developed a PDA- and GPS-based city guide, can implement these localisation algorithms and social software on this city guide platform to make a multimedia guide that works seamlessly indoors and outdoors. If the knowledge (localisation algorithms, tested social software functionality) can be passed on in a well-documented way, this will be more efficient in most cases than trying to move software from one platform/environment to another.

Another major advantage is that the knowledge is injected in an existing product, that has its marketing and sales channels, that has an existing user base and commercial references and that has a proven track record in the target domain of cultural heritage.

Development based transfer models of course need funding and IPR schemes that allow this kind of close cooperation between research partners and commercial partners (mostly SMEs).

### **3.3.3 Embedding**

When a research group wants to transfer a certain technology to an SME, it can be a good approach to embed an SME person for some time into the research group. This person acts as a temporary member of the research group and develops already certain features that are useful for the technology as a product. In this way, the SME person learns the structure of the software, grasps the knowledge and concepts behind the software, masters the interfacing with equipment or external data but also creates a tight link with the people of the research group (which is crucial when the technology goes through further development at the SME). The time that this SME person is embedded in the research group needs to be sufficiently long to create a good hold on the software and can be as long as a year.

This approach of course depends on a funding scheme to pay the SME person while working at the research provider and on the appropriate agreements concerning IPR, non-disclosure and non-competitiveness.

## **3.4 IPR issues for 3D content**

An important aspect of linking new technologies to companies is finding out how the results of new research can be turned into profitable business, in other words what are the potential business models behind a certain new technology. To test this out, we have done research on the use of the ARC3D software for commercial image banks. These companies have a profound interest in the efficient creation of 3D models of monuments and cultural heritage objects, as their traditional business of selling use rights of cultural heritage imagery is shrinking. We were able to discuss the issues with two leading companies in the field, Aisa Media (Barcelona) and AKG Images (Paris, Berlin, London), and a professional photographer of cultural heritage objects and monuments (Paul Maeyaert).

These companies are interested to complement their offering of images with multimedia, video and 3D models of monuments and cultural heritage objects. These new products are in fact derived results from their core business, which is selling imagery, and therefore allows to some extent a smooth transition into these new market segments. However, such new products raise immediately the questions of definition of added value, product specifications, market strategies and identification of customers.

They also raise the issue of marrying these new products with the other main domain in which these companies excel, namely metadata to allow efficient searching in the vast databases that these companies offer to their customers. These search capabilities are based upon multilingual thesauri for the cultural heritage domains that are covered by these companies, plus efficient processes of entering the data for every image in the database. On top of that, IPR software defines automatically the rights to be paid to the photographers that provide the photographs, based upon their contracts with the image bank and upon the contract that the customer has with the image bank.

Using the ARC3D software and associated CNR-ISTI tools for efficient creation of 3D models is quite well documented from the technical side, but much less from the aspect of workflow, quality or business models. Here, we briefly expand on the IPR (intellectual property rights) of 3D models generated by this set of tools, as this is uncharted territory but

nevertheless crucial to the development of 3D models as supplementary business for commercial image banks.

In photography, typically two main domains are distinguished. On one hand, there is the typical reproduction of paintings and other 2D artwork, which has in fact as single goal to make an as faithful as possible reproduction of the painting or artwork as possible. Of course, many technical skills are needed to perform such task, such as lighting, use of polarisation filters to reduce reflections, use of color filters to reduce the effect of aging varnish, to use colour targets to guarantee faithful colour reproduction, etc. The goal of the process however is to reproduce the artwork, not to add any form of interpretation or processing of the artwork. This type of photography is called *pseudo-photography*.

Normal photography on the other hand deals with the transformation of a 3D world in motion into a still 2D space. Lighting, lens angle, shutter speed, filters, camera point of view, perspective, image composition and in most cases that indefinable skill of picking the right moment, turn photography into a creative process that has everything to do with interpretation, storytelling and art.

This translates into the IPR of photography, where there is a kind of generic juridical consensus in Europe. While photographs of paintings and artworks have 20 year of authorship from the moment of creation of the photograph, all other photography has 70 years of authorship after the death of the photographer. These terms do not only define when photographs fall into the public domain but define also the level of fees that are associated with the reproduction of the photographs (as the ownership remains in the hands of the photographer or his/her heirs).

Of course, national laws can play a role in this. The most obvious example is Greece where every photograph (strictly speaking even a tourist photograph) of a cultural heritage object is property of the Greek Ministry of Culture. This means in practice that all professional photographs, but also all 3D scans or any derived product from photographs (for example 360 degree panoramas), is owned by the Greek Ministry of Culture and cannot be used in any public form (presentation, paper, website, ...) without approval (and payment of a fee).

Let us analyse what the generic IPR model means for 3D from images. First of all, the goal of 3D from images is to reproduce a 3D object, building or landscape as faithfully as possible. Hence, the photographs taken have as only goal to feed the 3D reconstruction algorithm, so the points of view, the exposure parameters and the image composition are completely subject to an optimal use of the reconstruction algorithm. As the result is a 3D model, there is no mapping anymore from a 3D world onto a 2D plane, there is no lens or point of view, and all time aspects have disappeared. So it is quite obvious that nearly all of the creative aspects of photography have disappeared from the capturing process and from the end result. Even the lighting of the object is dictated by the optimal use of the reconstruction algorithm and leaves very little room for creative input. In cases where it is difficult to alter the lighting of the object or space (for example the inside of a cathedral), techniques such as HDR (high dynamic range) photography can help, but they need to be applied again in a very standardised, non-creative way to fit within the 3D reconstruction algorithm.



*Pictures of Wroclaw Cathedral with 2 stops of overexposure, normal exposure and 2 stops of underexposure*



*High Dynamic Range image, calculated from the pictures above*

We can conclude that creating 3D models through the ARC3D software has a lot of analogy with pseudo-photography and therefore cannot be considered as a creative process. Further processing of the 3D models through the ISTI-CNR tools is also a technical, non-creative process. In other words, 3D models created from photography do not have the same IPR as most other photography, authors only can claim rights during the 20 years after creation.

When offering 3D models and other products derived from photography, the main issues are however to provide added value, to fit with the requirements of the customer and to add the appropriate metadata to the 3D model. This means that it is still a quite undefined process how to create 3D models of cultural heritage objects that can be made available through commercial databases. The only way to get this process defined is through research projects on one hand, that solve the remaining technical issues, and concrete projects on the other hand that tackle the workflow, business model and applicability issues. Many of such ground breaking projects are underway and will help to shape this business in the coming years.

## 4 EPOCH Network of Expertise Centres as a mechanism for bridging the knowledge gap between Cultural Institutions and Information and Communication Technologies professionals

### 4.1 Introduction

Whilst technological advances continue to permeate all areas of the heritage discipline, it is clear that there is still a major gap between the Cultural Heritage (CH) sector and the Information and Communication Technology (ICT) business sector which is slowing down the successful use and implementation of ICT technologies in the CH domain. This is due to a number of factors related to both the CH stakeholders and the ICT providers, including, most importantly, the *fragmentation of the sector, challenges in dealing with organisational and technological change, and the development of mature technologies for CH.*

#### *Sector Fragmentation*

The sector is widely fragmented and incorporates many different types of organisations including:

- CH institutions: for example, museums, heritage sites, archives, libraries;
- Information and Communication Technology (ICT) and CH research organisations including universities and other public and private research centres;
- ICT and Creative Industry commercial enterprises providing services to CH community;
- Local authorities, funding bodies and other public sectors custodians of heritage.

All these organisations belong to different disciplines, have diverse priorities and objectives, and communicate in different “languages”. A major objective of the EPOCH network has been to re-emphasise continually the holistic, interdisciplinary view of the role of all disciplines and encourage all the different groups to work on problems which have potentially sustainable practical applications in achieving technical objectives, underpinning sustainable businesses and effectively communicating cultural heritage.

#### *Introducing change in the CH Institutions:*

Cultural Monuments, Sites, Museums, Libraries and Archives - collectively referred to here as CH institutions - have for very long time been offering their services for civic engagement, cultural identification and enrichment. They are collecting, preserving, researching, curating cultural objects as well as providing access to sites and information which is critical to society. The value of these institutions to the society is so high that the most of these institutions are supported directly by the state, and even private collections are subsidised by public funds and private donors. This status has also created a dependency on public funding which produces a level of disturbance with each change that the institution wish to introduce. Changes and innovation in science and technology in the 21st century require different approaches in research, in business and organisational models, as well as the adoption of new policies. In the case of CH institutions, all the stakeholders need to be informed, and a consensus must be achieved, before the introduction of any change. The models, policies and other professional assumptions and ethics that have regulated the analogue era, with its constraints of time and space, are no longer suited to the digital world. New business models, together with cultural and legal policies, need to reinforce behaviours and values at regional and national level. There is no doubt that new technologies are introducing major organisational challenges in the CH sector.

#### *Development of mature CH technologies*

Research and investment in the technologies of communicating Cultural Heritage has resulted in significant progress, but the coverage of the whole process from initial investigation and knowledge

discovery to the communication of CH topics to educational audiences and the general public, in the form of particular applications and engaging experiences, remains incomplete. Most technology developed at universities and research centres, especially the more innovative and more complex technology, does not have the maturity and necessary features to be released within the CH domain. There is a need for more effective applications for intelligent content creation and management; for supporting the capture of knowledge and its sharing and reuse, in order to preserve, develop and disseminate cultural assets, improve learning and strengthen the creativity of the society. The use of ICTs – particularly by commercial enterprises – for capturing content and increasing its accessibility to citizens is still in its infancy. SMEs are innovators, system developers and creators of the interface between Research, Technological Development (RTD) and industry. It is predominantly the large ICT and CH Institutions that can bear these risks that support such activity. This has the effect of increasing the technology and knowledge gap between large and small organisations in the sector.

In addition to previous constraints, *the lack of knowledge* about the needs and behaviours of the users of this technology, create frustration and lack of success for CH institutions as well as for ICT companies involved. This is the main cause of any *lack of communication and trust* between the various stakeholders, as different communities in CH and IT are talking “different languages”; there is a “clash of cultures” and the convergence of interests is a long and painful process.

The concept and methodology of the Network of Expertise Centres (NoECs) were developed and implemented within the EPOCH Network of Excellence funded by the European Commission under the Sixth Framework Programme (IST-2002-507382). The aim is to overcome the major knowledge gap between the Cultural Heritage and the Information and Communication Technology sectors by understanding both worlds, providing training and facilitating knowledge acquisition of the domain from all perspectives, improving methodologies and techniques to fit better with the needs of the users, and debating new ways to introduce and use technology in CH that fits with the needs of the CH institutions.

This paper presents the concept and roadmap, as well as the methodological elements behind the creation of this Network of Expertise. The paper will further discuss the results and lessons learned as well as the successes and challenges encountered during the implementation of the network.

## **4.2 NoECs Concept, Methodology and Implementation**

The defining feature of the EPOCH approach is the development of a method to engage ICT research providers and knowledge/application intensive SMEs with the Cultural Heritage community. SMEs are deemed key to efforts to bring CH content to a wider European audience mediated by electronic devices (including computers) and the Internet. The CH sector is highly regulated and often politicised which to some extent renders it not amenable to SMEs with their product lead times and cash flow imperatives. However, this disjuncture is also an opportunity. In partnering the CH sector and ICT sectors, SMEs will be able to tap into the ongoing research worldwide and allow for global funding.

The objective, therefore, has been to create a Network of Expertise Centres each with a regional mission but organised at a European level network. Each Centre should be a not-for-profit organisation embedded in the regional governmental structure (for example museums, galleries, cultural centres, research organisations etc.). A cluster of companies, R&D development organisations, that are – or aspire to be - active in the CH and ICT domain, other CH organisations as well as funding bodies executives, surround each Centre. This structure enables participation in decision-making and implementation processes in cultural heritage whilst encapsulating local differences in laws, policies, culture and governmental structure. Expertise Centres should play a key role in the improvement of the cohesion of the Cultural Heritage sector, acting as the bridge between research, government, buyers and users, amongst others. It must be noted that an Expertise Centre represents the knowledge of all its stakeholders and only then can claim its identity as a Regional Expertise Centre.

The EPOCH consortium has provided a rich mixture of expertise in CH+IT, as well as competence in innovation management and organisational studies. Many partner organisations participated in workshops and focus group sessions before agreeing to take part in this experimental process.

However, building sustainable structures for providing incentives and cooperation, for knowledge creation and the sharing of best practice between different organisations that derive from a variety of disciplines and originate from different countries, is a difficult task. In this paper though, we demonstrate the utility of such a model as a vehicle for building these sustainable structures. In the next section we introduce the concept of the Learning Network before discussing the implementation of the Learning Network mechanism for Network of Expertise Centres.

#### **4.2.1 Learning Networks**

Learning Networks refer to networks of organisations where structures have been established with the primary purpose of enhancing the knowledge of its members. These networks:

- include representatives of different organisations (mainly, but not exclusively, private firms);
- are formally established with clear and defined boundaries for participation;
- have an explicit structure for operation with regular processes that can be mapped to the learning cycle;
- have a primary learning target – some specific learning/knowledge that the network is going to enable;
- can assess the learning outcomes that feed back to the operation of the network.

The formal character of the Learning Network provides an ‘institutionalised organisational platform’ which represents a permanent structure for identifying knowledge gaps and satisfying knowledge needs, allows evaluation and accumulates experience regarding the support required by learners. More significantly, the lasting character of membership in Learning Networks facilitates the development of trust relationships among learners.

Different types of Learning Networks at different stages of their development may be differently configured; they may be a “star” when information flows from the centre, a “wheel” when information flows mainly between members, and a “hub and spoke” when the structure of different activities is coordinated centrally. In the latter brokerage and the facilitation of extensive interaction and information flow between members is structured and encouraged at both regional and central level. The type, as well as the configuration of the network, may change over time. It is an evolutionary process starting with the star configuration (an information-focused phase) and progressing to the hub and spoke model (the multi-node knowledge-intensive operation). It is this journey that the EPOCH Centres of Expertise have been taking.

During the *set-up stage*, Learning Networks have a number of administrative and structural choices: decision-making structures must be established; learning processes need to be developed; and a dissemination policy should emerge. During the *operation stage* the network formalises its structure, process and roles. The final stage is known as the *maturity stage*, which potentially suffers the risk of organisational bureaucracy and rigidity. At this stage the formally established structures and procedures of the network can ossify and become a ‘core rigidity’ rather than a constructive learning vehicle. At this stage the network has the options of regeneration through changing its operation mode or alternatively suspending its activities. Learning Networks need an evaluation process to identify the causes of problems and to define remedial action. Networks evolve and develop only if they deal with the challenges occurring between these stages.

*Key elements of networks* are activities, actors, resources and processes. These four concepts are regarded as components of a relationship that are equally important and are dependent on each other as shown in Figure 1.

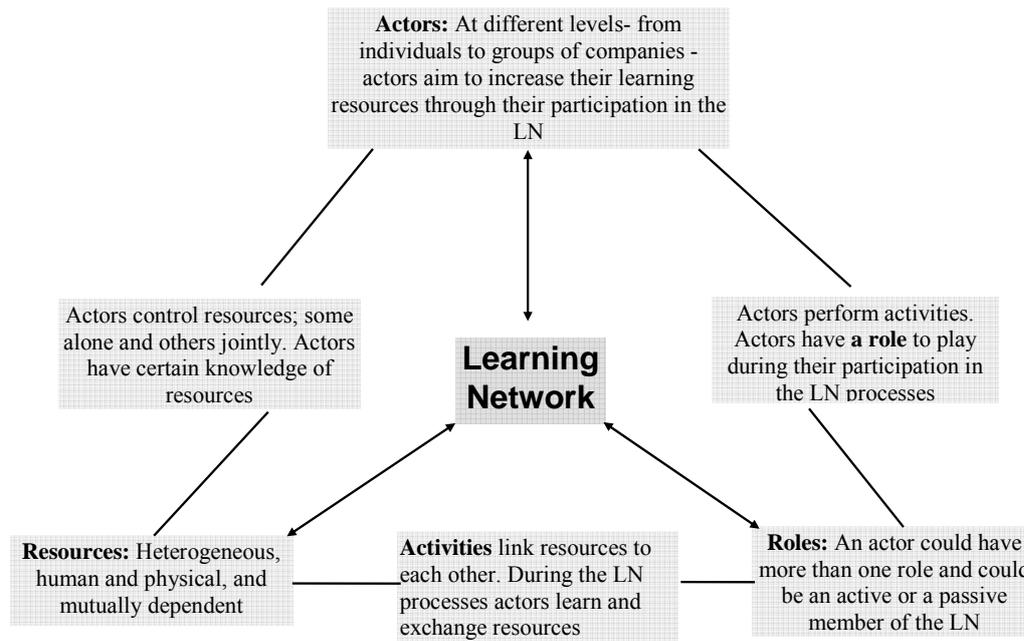


Figure1: Learning Network Model. Source: Adapted from Hakansson (1987)

Learning Network activities take place at three different organisational levels:

1. the single actor (a company/organisation or an individual representing a company) taking part in the various activities of the network in order to satisfy learning needs.
2. the learning group (a cluster of stakeholders) represents the core of the Learning Network because it is where the actors commit themselves to the core learning activities and form real communities of practice.
3. The Learning Network (Centre of Expertise) as a whole represents a dynamic entity which reconfigures its processes and resources over time.

Actors are defined by the activities they perform and the resources they control; they are connected to other actors by virtue of resources and roles. Each actor's unique combination of resources and activities constitute identity (Figure 1). The role of the actor can vary from being an active participant executing activity, or a relatively passive communication partner. Human actors are an integral part of any network's organisational process. In a Learning Network a set of typical roles can be identified as follows:

- Learning network moderators manage and co-ordinate activities, people and time. They know how to match learning needs with knowledge resources; to detect process deviations; to monitor the relationships between members, etc. Their knowledge tends to be tacit as it is experiential in nature.
- Learning group facilitators assist groups of practitioners in their structured reflection. The facilitators have gone through training and accumulated experience over time. The Learning Group Facilitator works also very closely with the Learning Network Moderator.
- Network members are individuals who represent an organisation in a learning network.
- Guests and/or experts are non-network members invited to participate in the network for a specific reason (such as presentation of a topic) and for a defined period of time.

Resources are elements that can be combined to create an asset. They may tangible like technology, materials or people, or intangible such as knowledge. The relationships between resource holders are themselves a resource. It is the relationships that bring about the essential mobilisation of resources.

Moreover, there are four key organisational processes to note: *Decision Making Process*, *Collaborative Learning*, *Learning Dissemination* and *Harvesting Learning*.

Power distribution and relations are important for decision making. It is assessed across four primary dimensions. First, the extent to which decision making is centralised (centralisation); second, actual participation; third, the extent to which decision making is regulated by explicit rules and procedures (formalisation); and amount of task differentiation (specialisation).

The decision-making process is taking place in two different levels in the Learning Networks: The network level and the group level. At the network level, the Learning Network Steering Group that is mainly responsible for the strategic planning of the network takes level decisions. The Moderator, by contrast, is responsible for tactical decisions that reflect the supposed interests of the network members. Thus he is responsible for the brokerage activity of the network. During the decision making process, the network establishes its rules and procedures (setting up, running and sustaining); primary objectives; structures of operation (membership, fees, etc); procedures for recruiting new members; co-ordination mechanisms; roles in the network; participation procedures for Participating in Learning communities; and IT integration.

During the collaborative learning process the network members engage in a peer learning-teaching process. Here real time issues are addressed. All members are expected to share ideas and experiences and, consequently, learn. However, trust needs to have been fostered in the set-up and training phases if the Learning Network is to function as a locus for innovation. The exchange of resources – and the willingness to engage in that exchange with its expectation of reciprocity and discretion – provides access to knowledge and resources that are otherwise unavailable. We argue that Learning Networks are unique in that the experience presents an opportunity for critical reflection and improvement. It introduces members to new and/or enhanced concepts and frameworks. Members can experiment and evaluate outcomes with peers. Moreover, shared learning helps explicate the system's principles and elucidate the underlying patterns.

Learning Dissemination involves the transfer of knowledge and learning beyond the group into the members' organisations. Harvesting learning is associated with ensuring that there are distinct practical outputs and applications generated in organisations as well as for the improvement in the operational processes of the group and the network as a whole.

In the next section we present some dimensions of the operationalisation of this model in the EPOCH network.

#### **4.2.2 Implementation of Expertise centres in CH: The Roadmap**

During the EPOCH project, the LN model described in the last section has been adapted and implemented in order to create a Network of Expertise Centres in the area of Information and Communication Technologies (ICT) and Cultural Heritage (CH). The *set-up stage* involved establishing a better understanding of the needs and challenges faced by stakeholders involved in the Cultural Heritage domain. Thereafter, the Learning Network methodology was adapted as was a strategy on how to encourage all the stakeholders to participate in the EPOCH Network of Expertise Centres.

The NoEC model *contains two levels of clustering expertise and learning activity*; the local /regional NoECs learning Communities and the European level network.

At the core of the Network of Expertise concept is the recognition that CH is largely local. CH is, however, linked to national or regional structures (ministries, organisations), local laws and customs, local culture and practice.

While each centre creates a cluster of stakeholders (organisations, ICT and creative industry SMEs, RTDs and funding bodies) at the regional level that form their local learning community, all the centres together form a community and organise themselves in a European learning network. The NoECs moderation steering group performs the overall functions, structure, methodology and activities of the NoECs as well as the facilitation of the top-level cluster.

At European level, each centre is represented by a not-for profit organisation responsible for a *region*, which – if possible – is a cultural entity such as, for example, Flanders or Andalusia, and has a *mandate* to act as such in that region. Currently, the prototype network has 9 such organisations involved at the European level and 6 of them are in the process of creating regional expertise centres (see figure 2). In addition to those, two international partners have taken part in a range of activities during the whole process (CultNat-Giza Egypt, and Unesco World Heritage Centre).

As noted earlier, during the set-up stage, learning networks have a number of administrative and structural choices: decision-making structures must be established; learning processes need to be developed; and a dissemination process should emerge.

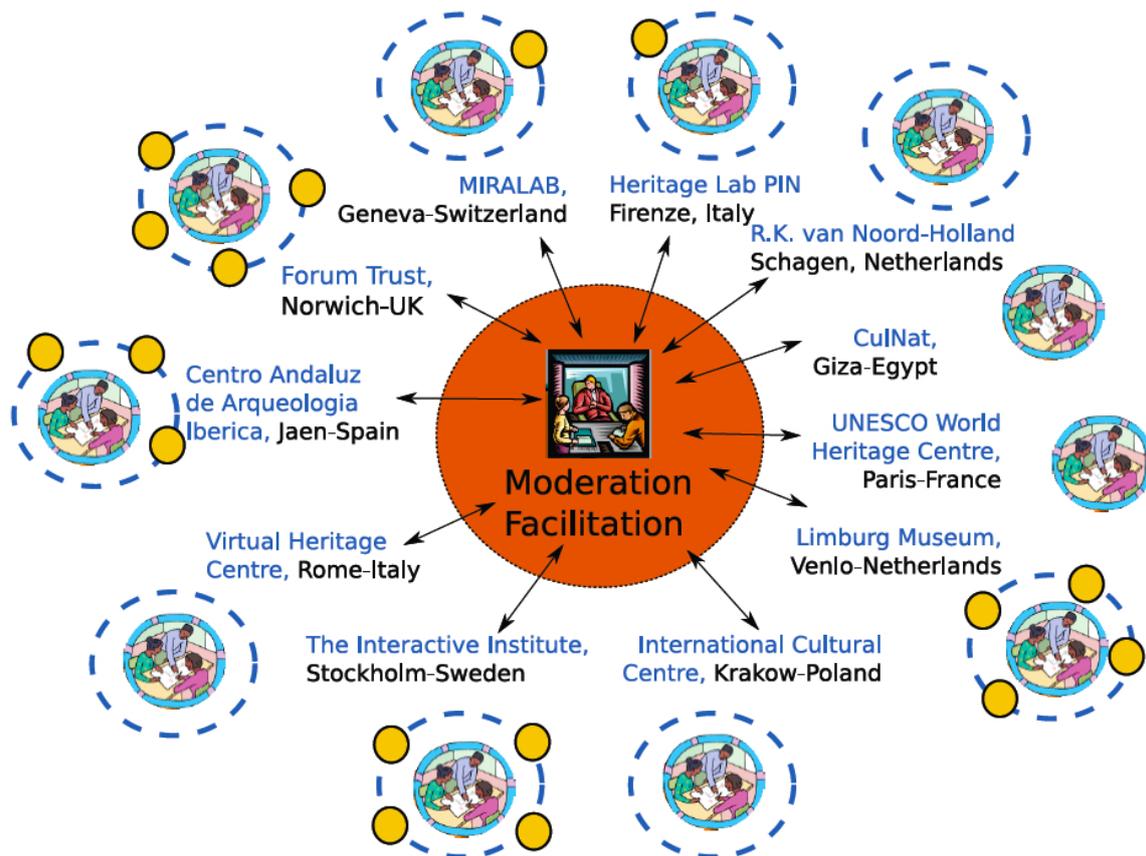


Figure 2: EPOCH Network of Expertise Centres

In this particular case, the challenge has been greater. We must note that we have followed an evolutionary approach that has not yet – to our knowledge – been implemented in any other sector. We apply the LN approach to build up a “new” sector at a European level. That means that the set-up stage had to be designed and implemented with participants with different expertise in CH and/or ICT, from different countries. The combination of experts and practitioners was also very important. We also made a choice to run this group as a “Learning Group” and not as an “Experts’ Group”. The reasons for this decision are the following:

- to create sustainable structures. We did not seek to create one more advisory body/executive committee with experts where people meet and discuss for the duration of a project. We wanted to empower people with a structure and tools in order to implement their ideas in their own region, during and after EPOCH;
- to build consensus over what an expertise centre in CH+ICT should be; defining functionalities and concept regardless the differences in culture, expertise, authority and interests;
- to build trust – create a community;

- to familiarise the members with the concept and techniques of a LN and demonstrate its advantages;
- to familiarise members with strategic thinking;
- to map knowledge gaps and identify expertise in the area.

Recruitment tended to be either internal to the EPOCH network - with an overall involvement of over 100 organisations - or by invitations extended to known candidates who the facilitators thought may benefit from the training and the networking experience. The candidates were invited to focus groups or workshop sessions (held in Brussels, Ghent and Pisa). All had some interest in establishing Expertise Centres for which Learning Groups/Communities are a core component and a qualification for such 'accreditation'. At this prototype stage, the main criterion was the involvement of the organisation in CH+ICT projects, as well as their commitment to participate in a learning process of collaboration and the sharing of best practice, which would lead to building consensus and organisational change.

The centres did not start from scratch and all have different backgrounds, just as they all have different specialisations. Some of them are specialised in archaeology related matters, while other centres focus on technological know how and/or know how with regards to monuments or tourism. This means that the centres as a learning community represent a vast amount of diverse knowledge, and include stakeholders from different disciplines with different priorities communicating in different "languages". The members of the EU level Learning Group (LG) were drawn from a variety of institutions, organisations and countries. In the end there were 16 members from 11 institutions. However, generally, meetings were attended by between 10 and 15 people.

The operation stage of the European level of the network was launched with a networking event with the general theme of "Discussing a Technological Pipeline in CH". SMEs and potential Expertise Centres were invited and it took place in Brighton on 13 January 2006.

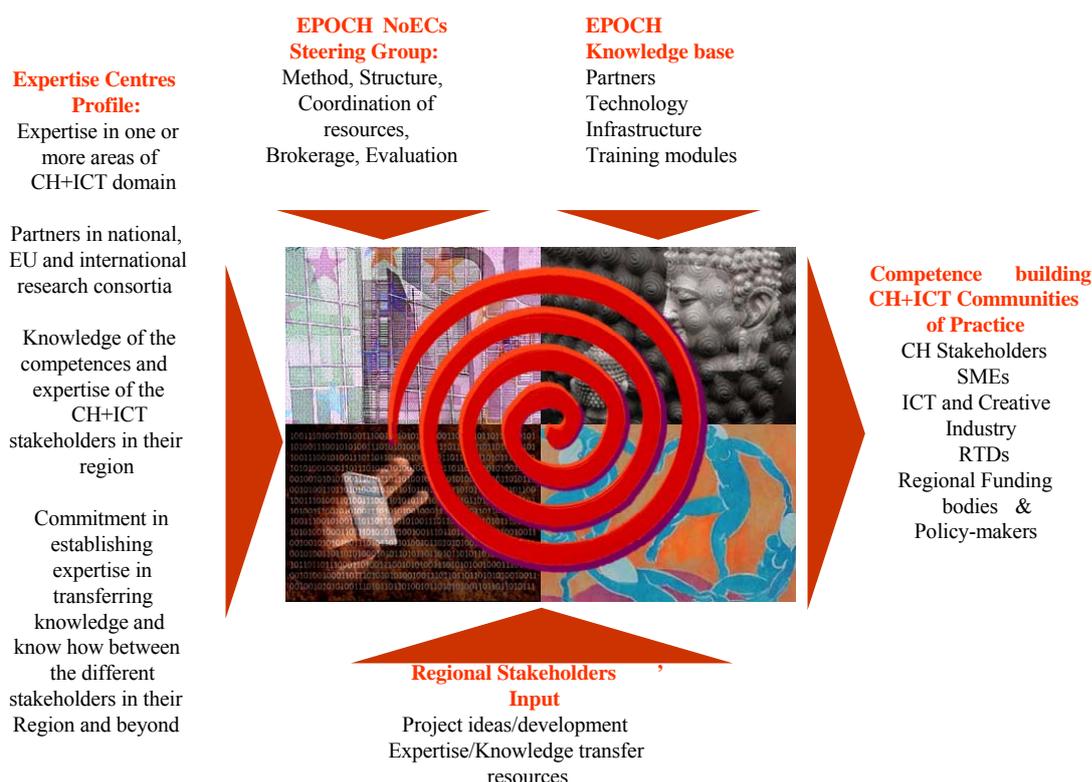
By this time we had also defined the methodological steps for the deployment of the NoECs in the local/regional level as a road map, to assist us during the implementation process. Those are:

1. **Defining the needs and requirements of the Centres** by mapping the training and organisational development needs. This task was first performed during the recruitment process of the European Network (recruitment workshop) and then by visiting each of the centres as a group and organising workshops with its members. By the end of the first year of operation almost all the members of the group had been assessed.
2. **Establishing regional meetings and Focus Groups for each Centre**, consisting of local companies, funding bodies, local RTDs and other CH organisations to be interviewed. After this they were invited to attend a workshop where their needs, priorities and requirements would be discussed, the concept of the NoECs in CH presented and they would decide if they would like to participate in the establishment of their own regional expertise centre in CH.
3. **Training Facilitators** for the learning cluster/community of each Centre, as well as the NoEC learning group (each Centre needs at least one trained facilitator). CENTRIM, UOB has developed a training module adopted on the needs of the sector.
4. **Establishing the Learning Networks** which means that regular physical meetings of the learning communities are organised in the start up phase in order to get people to know each other and build up trust; this evolves into communication through the EPOCH website for the European level of the network;
5. **Organising observation and evaluation** of the learning networks and providing corrective actions. This includes observations as well as in depth interviews with most of the partners of the network.

### 4.2.3 NoECs templates defining structure, functionalities and criteria for Expertise Centres in CH+ICT

During the last two years of operation we have been experimenting with different elements and processes derived from the LN model, which has much to do with the defined organisational infrastructure of a NoECs in CH+ICT; namely:

- Coordination/governance; University of Brighton was leading the activity and formed a steering group together with Visual Dimension, Belgium and The Interactive Institute, Stockholm;



**Figure 3: EPOCH Network of Expertise Centers Template**

- Structures of operation (format of meetings -dates and places- actions taken-documentation, LN facilitation training, coordination of resources, integration of various activities internal and external to EPOCH partners)
- Roles in the network (facilitators, members, associate members, experts)
- Profile, primary objectives/functionalities of Expertise centres (consensus building)
- Procedures and criteria for recruiting new members;
- Building a knowledge base, of stakeholders, expertise, technology infrastructure, training requirements etc.

Figure 3 summarises the profile and the functions that a regional Expertise Centre need to perform in order to enhance learning, build competences and achieve knowledge transfer and collaboration between the different stakeholders in its region. The structures of operation and the facilitation skills to implement the LN activities are part of the training that the members of the NoECs LG have received.

We must note that there is ongoing support, mentoring, evaluation and adjustment tailored to the particular environment for each of the ECs. Furthermore, at the European level, a structure to organise the knowledge base and resources of the EPOCH partners has been established to facilitate brokerage

and training modules development activity for the whole network. As we have described earlier, it is this organisational infrastructure of the network that will provide a sustainable system to organise the knowledge and competence development in the new sector, as well as the mode of adaptation and dissemination between the different stakeholders.

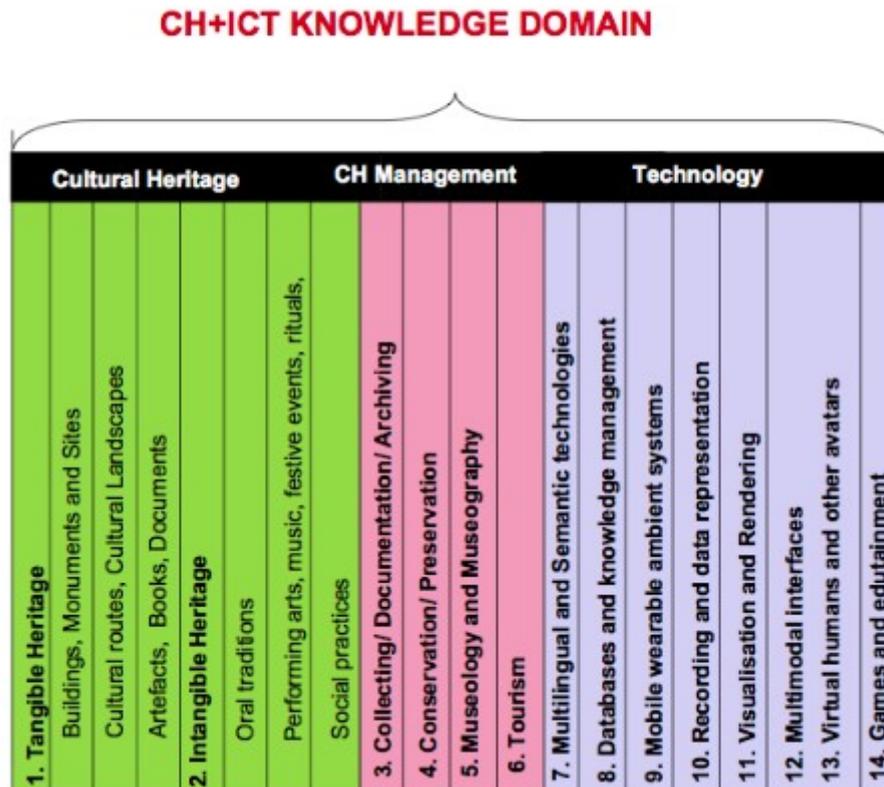


Figure 4: Knowledge domain in CH+ICT

The different *roles* in the network – and especially in a LG – have also been defined. The difference of a member and an expert has been identified and lessons learned. An expert in a Learning Network has two choices:

- to become a member of a learning community where he/she may need to spend a lot of his/her time for free<sup>1</sup> and where he/she may develop ideas and collaborative projects with other “learners”; or
- to be an expert on specific issues and be invited from the group for a session(s), when the group needs his/her expertise. A fee could be paid for this service.
- a similar principal applies with the identification of an Expertise Centres. One of the primary objectives of an Expertise Centre is to contribute in the CH+ICT domain by playing a part in the creation and professionalisation of a new interdisciplinary sector. An organisation could have the capabilities and expertise in the CH+ICT domain, for becoming an Expertise Centre member of the Network, but if it does not have an interest to perform a “liaison function” – in other words to become the intermediary who will facilitate competence building and knowledge transfer between the CH+ICT stakeholders in its region – then it can always play the “expert’s” role, or a participant’s role whilst not becoming an expertise centre itself.

<sup>1</sup> Members of a learning group normally meet once every month for three hours. However, in the case of the EU NoECs LG, the members met monthly for two days workshops/training, visits, and action learning sessions.

<b>General</b>
<ul style="list-style-type: none"> <li>• Mission statement, organisational goals</li> <li>• Context, story, value system</li> <li>• Discipline competence</li> </ul>
<b>Organisational readiness</b>
<ul style="list-style-type: none"> <li>• Type of Institution</li> <li>• Size of Institution</li> <li>• Skills portfolio (ICT, CH)</li> <li>• Activities in CH+ICT area (publications, research projects, turnover of CH+ICT projects, training, consulting, exhibitions)</li> </ul>
<b>Strategic value of CH+ICT</b>
<ul style="list-style-type: none"> <li>• Type of commitment from top management</li> <li>• Strategy documentation (targets, goals, milestones)</li> <li>• Allocated resources (human, financial)</li> </ul>
<b>Degrees of Interaction with regional/national and international stakeholders</b>
<ul style="list-style-type: none"> <li>• Knowing the local/regional/international stakeholders in CH+ICT <ul style="list-style-type: none"> <li>○ Scanning the local</li> </ul> </li> <li>• Activities with different stakeholders <ul style="list-style-type: none"> <li>○ Formal (teaching, training, workshops, research, exhibitions, consultancy, visits)</li> <li>○ Informal (social networking, meetings, etc.)</li> </ul> </li> </ul>

Table 1: NoECs : Basic criteria template

#### *Expertise Centre Activities:*

The interaction between CH+ICT needs to be one of the strategic values of the EC organisation, stated in their vision and performed by four distinct but related operational functions:

- A. **Organisational Expertise:** In Figure 4 we have identified the Knowledge domain of an EC in CH+ICT. The Knowledge domain structure template is one of the outcomes of the EPOCH NoECs group. An EC needs to have expertise in one or more areas of this domain and demonstrate partnership with other regional organisations with complementary expertise know-how.
- B. **‘Observatory’ function:** An EC needs to gather and disseminate information on CH+ICT at least at the local/regional level; they also need to be aware of their partners/competitors in the area and have assessed their capabilities. The observatory function will be strengthened with the participation in the network level and enriched with the brokerage activity.
- C. **‘Project’ function:** To carry out projects in the field of CH+ICT with local stakeholders and international partners;
- D. **‘Liaison’ / building competence function:** This is the most important activity of a regional expertise centre. The centre must demonstrate a commitment to establishing expertise in transferring knowledge and know-how between the different stakeholders. As we stated earlier, an Expertise Centre consists of the knowledge and know-how of its parts (stakeholders). Therefore, the ability to coordinate resources, to identify synergies between cultural heritage stakeholders and ICT companies or RTDs and to communicate needs and demands at the European level of the network, are vital for the successful implementation of the network. This activity is supported by the Learning Networks methodology with structured “learning group” meeting schedules.

## Learning communities meetings

The local Companies, CH stakeholders, Research Centers, and Funding and Policy makers' representatives, together with each Centre of Expertise form a Learning Network. Using action-learning techniques, practitioners' groups are set up to reflect and learn collectively

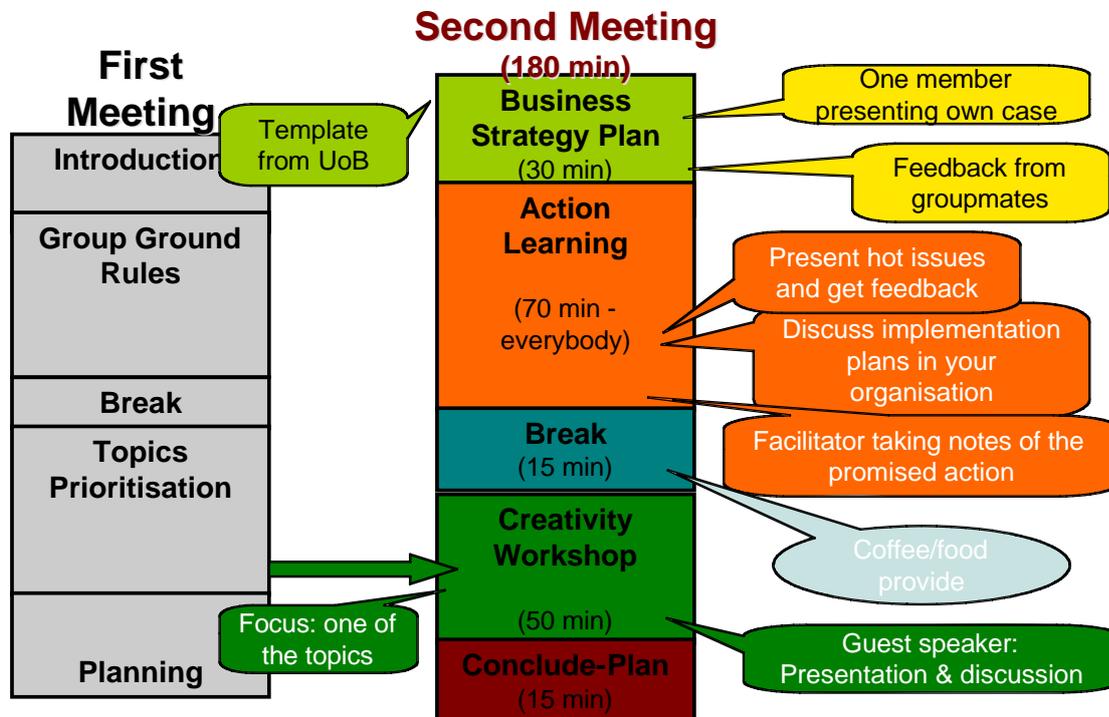


Figure 5: Structure of Learning communities meetings template

from each other, following a number of principles:

- Organisations and companies, represented by managers, are allocated in small groups with up to 20 members;
- All necessary decisions for learning are made by the learners themselves rather than experts and tutors;
- Learning is practical and derives from the discussion of the concrete experience of the group members rather than the introduction of abstract concepts;
- Training is designed based on members' needs, and provided by the Network;
- Part of the participants' duties is to go to their own organisations, try out the learned approaches and come back to the group to report their experiences;
- The group becomes a forum for sharing concerns, getting psychological support and also receiving feedback on their own ideas from other practitioners;
- Experts and tutors may be invited, when the need arises; a knowledge bank of experts and expertise is provided by the EPOCH NoECs brokerage activity.

The group sessions are 'guided' by an appointed facilitator who is responsible for organising the group meetings, developing the group dynamics (e.g. involving everybody, resolving conflicts) and maintaining its objectives. The facilitator is a supportive coach stimulating the group to achieve motivation and inspiring trust.

Knowledge resources are used but only in conjunction with their practical learning. This process will allow companies to determine needs for training or cooperation and will be the platform to discuss further developments and standards in the CH sector. As the Centres of Expertise will originate from governmental organisations, but have the mission to understand and improve the development and implementation of ICT, they will form ideal partners to coordinate the regional clustering activity.

#### 4.2.4 EPOCH NoECs: the model

The vision of the EPOCH NoECs discussed and documented during the consensus-building period of the network is:

*“ to create collaborative learning communities for the CH and ICT sectors by developing an infrastructure, the Network of Expertise Centers (NoEC), that supports shared learning on a regular and sustainable basis. The Network will facilitate European integration of research outputs in CH and ICT and empower commercial and social enterprises in the ICT and Creative Industries sector to engage fully in the deployment process ”.*

The Network has a coordinator (at the moment this role is executed by the steering committee, but the creation of HerITage.net foundation is envisioned in the near future) to organise the overall activities of the NoEC. Each Expertise Centre is juridically and financially independent and has a contract with the coordinator concerning the network’s activities, rights and duties. The Network, through its coordinator, will ensure an optimal exchange of information between the centres, a European or even worldwide quality assurance methodology and a centralised technology transfer.

Each Expertise Centre is active in its region, which in most cases will be defined by the region of activity of the founding governmental organisation. Activities outside this region can be regulated by coordinator or by contracts, so that no conflicts emerge between the Expertise Centers.

A number of mechanisms and concise methodological guidelines are built into the work structure in order to enable the accomplishment of this complicated task and was presented in the previous section. The structure of the EPOCH Network of Expertise Centres today is presented graphically in the figure 6.

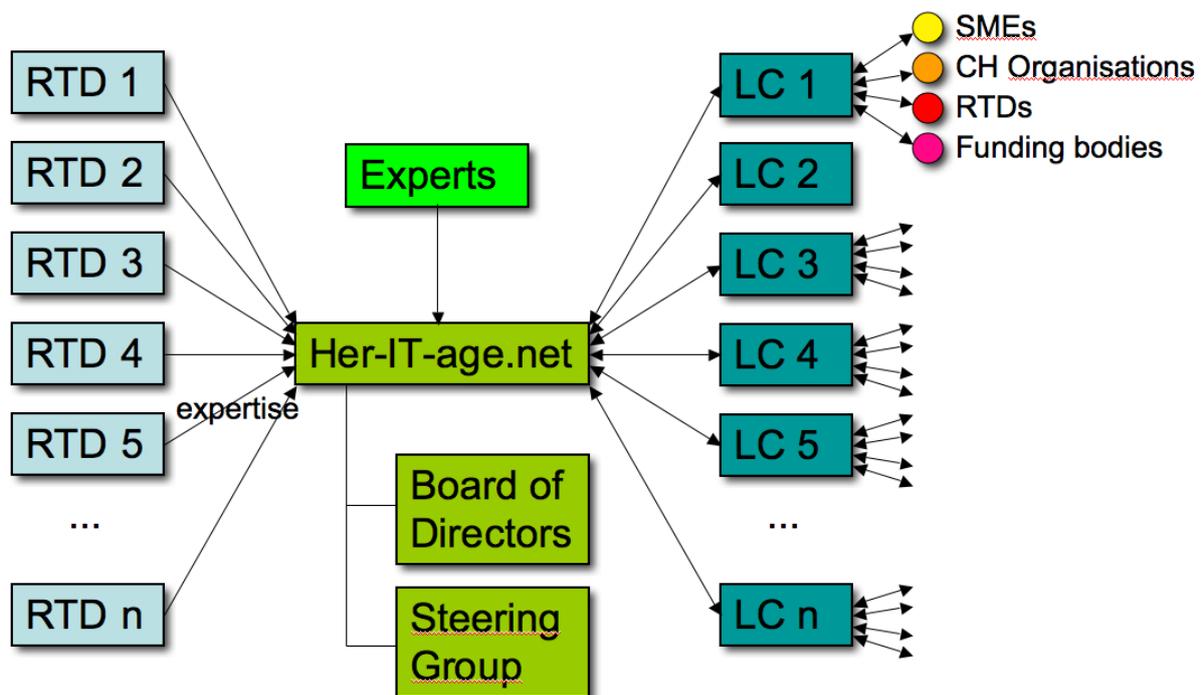


Figure 6: EPOCH Network of Expertise Centers model

On the left side of the graph, different EPOCH partners provide expertise (on technology, CH and innovation management issues) through the steering group to the NoECs and their learning communities. The EPOCH brand name has guaranteed quality of research, which has attracted CH organisations and SMEs to become partners in the NoECs Learning Communities.

On the right side, the pilot Centres – Forum Trust, Norwich UK, Limburgs Museum, Netherlands, the Interactive Institute, Sweden and the Jaen- Andalusian Expertise Forum – are at different stages of the journey towards establishing durable and productive regional networks. They have all established

good partnership with their SMEs, CH institutions as well as policy makers and funding bodies representatives. Two more Centres - MiraLab in Switzerland, and the University of Madrid - have decided to embark on the journey, have been trained and have started the process of recruiting members (stakeholders).

The EPOCH NoECs and their Steering group offer the intermediary infrastructure to support the networks with expertise and services as well as communicate the demands and requirements of the network members to the academic research community. In doing so, they bridge the knowledge gap between academic research, SMEs and CH practitioners. The benefit of organising this mutual information exchange through a learning network is undeniable. When a certain centre needs information about a certain specialisation, it can contact the specialist in the appropriate centre

Critically, the learning from these six distinct networks needs to be harvested and disseminated across existing developing European networks, as well as those proposed by the Consortium members. This is a major undertaking. Whilst the learning networks have been empowered and trained in the process of harvesting learning, the evaluation, interpretation and transfer is a task beyond the competence and expectation of regional groups. The EPOCH Steering group has monitored and evaluated the whole process so far and the challenges and lessons learnt from this journey are summarised in the final section of the paper.

### **4.3 Challenges and Lessons Learned**

At the beginning of this paper we discussed factors that are slowing down the successful use and implementation of ICT technologies in the CH domain. Those factors related to both the CH stakeholders and the ICT providers, and include amongst others the *fragmentation of the sector, challenges in dealing with organisational and technological change and the development of mature technologies for CH*. We then proposed the learning network approach in order to create a sustainable structure for the sector to overcome those challenges. We argued that Learning Networks are unique in that the experience presents an opportunity for critical reflection and improvement. They introduce members to new and/or enhanced concepts, technologies, business models and frameworks. Members can experiment and evaluate outcomes with peers. Moreover, shared learning helps explicate the systems' principles and show the underlying patterns. At the end of the process communities of practice are developed and organisations build and/or improve their competences.

However, we are aware that building sustainable structures to provide incentives and cooperation, for knowledge creation and sharing of best practice is a difficult task. In this particular case we have followed an evolutionary approach that has not yet – to our knowledge – been implemented in any other sector. We apply the LN approach to build up a “new” sector at a European level. That means that the set-up stage had to be designed and implemented with participants with different expertise from different organisations that derive from a variety of disciplines and originate from different countries and culture.

According to the organisational learning literature, the main driver to learning, networking and business development/change among SMEs as well as other small organisations -like museums, galleries, libraries etc.,- is an immediate need to solve a problem or seize an opportunity. However, from our research and experience in different projects ION (EPSRC&BT/1996-99,U.K), TREND CHART (2000/F5-EC), KNOWLABORATION (2002-4/IST/F5-EC), KM in SMEs (2004-6/SEEDA, UK), SM-Empower (2004/F6-EU), EPOCH (2004/IST/F6-EC) it is clear a number of barriers to participation in training and development are faced. Those barriers could be summarised as following:

- No recognition of the need for learning and development;
- Stimulus for change is too weak/misinterpreted;
- No access to valid knowledge/confusion about where to go for advice and support;
- Resource constraints, both human and financial;
- General cynicism and mistrust of external providers, (too academic/too abstract);
- Insufficient buy-in to development of the sector from the policy level, such that significant opportunities are illusory;

- No interest from organisations to play the role of Expertise Centres.

These barriers have been recognised at the very beginning of the project, and we were facing them in each of our first regional meetings in Brussels, Norwich, Krakow and Jaen and have taken them into account when trying to engage businesses, policy makers and CH organisations to ensure their continued participation in the EPOCH learning clusters.

In order to overcome those barriers, we guided the Expertise Centres to contact their local stakeholders and organise focus groups to:

- Discover the challenges that the different stakeholders face locally, at the industry and/ or policy level, as well as internationally;
- Identify the learning issues confronting the stakeholders in order to cope with those challenges;
- Demonstrate how action learning technique would help them to solve some of their burning issues and build understanding and trust relations among participants;
- Specify and prioritise a learning agenda arising from those issues and discuss it with them in the first meeting of the group.

At the last three Regional meetings though, in Athens, Madrid and Geneva we were pleased to realise the importance of EPOCH brand name in the participation and commitment of the different stakeholders in all those countries. Participants were eager to become part of the network and its activities and become part of the NoECs database and brokerage even after the project finishes.

The Table 2 summarises *the EPOCH NoECs Capabilities Strengthened* according to six criteria measuring results on Learning Networks activities:

- Governance and organisation
- Collaborative strategy development plans, systems and procedures
- Communication systems (internal and external)
- Network/member relationships (internal and external)
- Sectoral and/or technical expertise of network/members
- Financial resources

These results are the outcome of a research evaluation based on participatory observation (European level Network, Norwich, Venlo-partially,) and in depth interviews (Sweden, European level Network, Norwich, Venlo) with 90% of the participants' members of the Network

Network Capabilities Strengthened	Network Incidence
<p><b>(1) Governance and organisation</b></p> <ul style="list-style-type: none"> <li>☉ Developed Vision, Mission, Code of Conduct, membership requirements</li> <li>☉ Recruited new members</li> <li>☉ Initiated process to legally register network</li> <li>☉ Established new thematic sub-committees/working groups e.g. training modules, know-how books</li> </ul> <p><b>(1a) Network Strengthening best practices</b></p> <ul style="list-style-type: none"> <li>☉ Convene members for participatory planning</li> <li>☉ Institutionalise cooperation, rather than compliance, in agreements and structures</li> <li>☉ Build expertise of members and network staff</li> <li>☉ Establish role as moderator/facilitator of members' action</li> </ul>	<p>All</p> <p>All</p> <p>EU level</p> <p>EU level</p> <p>EU level</p> <p>▼</p> <p>▼</p> <p>▼</p> <p>▼</p>
<p><b>(2) Collaborative strategy development plans, systems and procedures</b></p> <ul style="list-style-type: none"> <li>1☉ Developed strategic and operational plans</li> <li>2☉ Improved efficiency and effectiveness of planning</li> <li>3☉ Developed coordination procedures, systems</li> <li>4☉ Increased member commitment to network and shared goals</li> <li>5☉ Integration of EPOCH Brand</li> </ul>	<p>All</p> <p>All</p> <p>All</p> <p>All</p>
<p><b>(3) Communication systems (internal and external)</b></p> <ul style="list-style-type: none"> <li>1☉ New communication strategies &amp; mechanisms</li> <li>2☉ Established/updated websites</li> <li>3☉ Established e-systems for member communication</li> <li>4☉ Links to other networks : EU, business, education</li> </ul>	<p>All</p> <p>EU &amp; MiraLab</p> <p>EU level</p> <p>Venlo, Norwich</p>
<p><b>(4) Network/member relationships (internal and external)</b></p> <ul style="list-style-type: none"> <li>1☉ Better mutual understanding</li> <li>2☉ More open and tolerant communication</li> <li>3☉ Development of trust; stronger connections among members</li> <li>4☉ Advocacy and cooperative engagement</li> <li>5☉ Links to key external stakeholders, e.g. other EPOCH</li> <li>6partners through brokerage</li> </ul>	<p>All</p> <p>All</p> <p>All</p> <p>All</p> <p>EU level, Sweden &amp; Norwich</p>
<p><b>(5) Sectoral and/or Technical expertise of network/members</b></p> <ul style="list-style-type: none"> <li>1☉ Improved knowledge and skills</li> <li>2☉ SME- led knowledge transfer</li> <li>3☉ Initiated a moving exhibition of prototype applications “Interactive Salon”</li> <li>4☉ Thematic clusters, training modules</li> <li>5☉ Post-Incubator model knowledge transfer</li> <li>6☉ CH institutions-led knowledge transfer</li> </ul>	<p>All</p> <p>Venlo</p> <p>Sweden</p> <p>EU level+UNESCO</p> <p>Sweden</p> <p>Norwich</p>
<p><b>(6) Financial resources</b></p> <ul style="list-style-type: none"> <li>☉ New grants and program partnerships with donors</li> </ul>	<p>Norwich</p>

Table 2: NoEcs Capabilities Strengthened

## 4.4 Discussion and Conclusion

This paper has presented the concept and methodology of the Network of Expertise Centres (NoECs) as well as evaluative reflections on implementation. Both play a key role in the improvement of the cohesion of the CH and ICT sector by acting as the bridge between research, government, buyers and users amongst others. The Network of Expertise Centre is based on the Learning Network model which incorporates a combination of knowledge management and, in particular, tacit knowledge and clustering. Learning Networks have proved to be useful mechanisms for bridging the knowledge gap between CH and ICT professionals.

The implementation of this methodology in the ICT and CH field within the EPOCH Network of Excellence has demonstrated that:

### *EPOCH Brand*

At the close of the project, there are four functioning Expertise Centres: Norwich, Stockholm, Limburgs and Andalucía. In addition, there are two putative Expertise Centres: Switzerland and Madrid (both of which have hosted Regional Meetings). One further group – Mediterranean – is looking for Expertise Centre status by the close of the project. For all of these groups, EPOCH Expertise Centre status confers a legitimacy that cannot be achieved by any other means. The EPOCH brand has considerable currency amongst the CH community.

### *Learning group*

None of the Expertise Centres have fully implemented action-learning techniques in line with the Expertise Centre model. There are a variety of reasons for this that need to be addressed in the future. On the one hand, the cases of Stockholm and Andalucía demonstrate the impact of geography on physically locating members sufficiently regularly to practice action learning. By contrast, other Centres are reluctant to move away from large group learning within the confines of generic topics into the more specific issues encountered in action learning sets. Some facilitators have reported that they sense that action learning sets would either disrupt the flow of substantive discussions, or that they would deviate from building a collective identity in what is already a small group. Others are reluctant to expose themselves amongst peers and competitors. Moreover, as reported previously, many of the participants – predominantly male – are senior people used to engaging in group discussions and the notion of action learning is far from their world-view. It should also be noted that trust and familiarity are necessary for small group exchanges. The authors have witnessed considerable trust-based exchanges occurring in the longer-lived Centres of Norwich and Limburgs.

### *SME involvement*

All of the Expertise Centres have good representation by SMEs; however, the incentives to stay involved – possibly in the absence of action learning sets – need to be improved. Stockholm's post-incubator remains a beacon in this respect. The entrepreneur who heads the first of the post-incubator companies benefits from being immersed in the technologies and the process of technology transfer (for example, from Interactive Salon to prototype for museum exhibition). All SMEs suffer from the long lead times associated with bidding for funds and contracts in the public sector.

However, established SMEs – as seen in Norwich and Limburgs – continue to support the Expertise Centre and participate substantively to debates and discussions. One reason is the procurement power of the host (the Forum Trust and Limburgs Museum). Allied to that, the network provides intelligence that is more difficult to get from other sources.

The cases indicate that sustained SME involvement might come from enhanced 'boundary spanning'. Whilst the hosts play the role of observatory, knowledge diffusion is not systematic (especially in cases where meetings have stalled). It has been reported that SME members particularly appreciate more information about – and perhaps demonstrations of – technologies coming out of EPOCH activities. The website has a role to play here; but hands-on experience is preferred (c.f. Limburgs Expertise Centre's trip to Philips). Allied to this, access to resources such as Know-how books and

other practical guides is valued. These resources, equally, have the potential to increase the flow of knowledge from the CH professionals to SMEs (as noted by SME members at Limburgs).

### *Educational Programmes*

The Stockholm Expertise Centre has incorporated a post-graduate course for CH professionals. The technology transfer opportunities here are significant if under-utilised. Students engage in a real-time project with a diverse range of CH institutions in a technology transfer project. Full integration of course members and convenors into the meetings of Expertise Centres has considerable potential in this respect. Partner institutions can benefit from a transfer mediated by students to their visitors, whilst other members of the Expertise Centre can share in the problem-solving of in institutions. Moreover, course books and materials can have enhanced value if the Expertise Centre leverages them in its own work. Equally, visiting lecturers can be an important source of ideas and stimulation to a wider community.

### *Influence on regional/national policies*

Over time, it seems that personnel change which has the potential to stall or provide new impetus for activities. In the latter case – and particularly for small countries – integrating Expertise Centre thinking and organisation into national policy is a real possibility. The two notable examples are Hupperetz's move to Dutch National Heritage and Hans Öjmyr's leveraging of the Interactive Salon to engage local and national politicians in his museum. The indications are that Madrid, Andalucía and the Mediterranean all seek regional and national advantage through the Expertise Centre.

In summary

- Benefits to members include improving knowledge about the CH/ICT interface as well as enabling strategic thinking and generating project ideas.
- More work is needed to recruit, integrate and retain stakeholders, particularly ICT enterprises, into networks.
- Skills and knowledge transfer have shown encouraging results. Although, we note that lessons learned cannot always be transferred directly without adaptation to regional circumstances.
- The network has also led to collaboration between members as competences and assets are rendered explicit by the learning process.
- The concept of learning networks represents an unfamiliar learning environment, and its intangibility should not be underestimated. The context is very important and understanding why an individual is involved in the network and the opportunities that present themselves is important.
- The role of the facilitators is critical. Hence, the training programme is of great significance; however, this does not guarantee in itself facilitators' competence. The cases show that facilitators need additional 'on the job' guidance to hone the skills in real-time situations. Action Learning, for example, in network situations is a step that requires some courage to undertake owing to discernible scepticism amongst network members.

These results demonstrate the utility of Learning Networks as a vehicle for building sustainable structures for creating trust and cohesion between the two distinct sectors. The first implementation of European regional groups in UK, the Netherlands and Sweden was followed by groups in Spain (UPM, Madrid and Centro Andaluz de Arqueología Iberica, Jaén; MiraLab, Geneva). The methodology is dynamic and subject to ongoing development in light of experience and local circumstances. This informs the best structure, process and roles that each centre should have. It is envisaged that this initial implementation phase and the lessons from the pioneer centres will lead to a wider European Network driving the emergence of this new sector.

## 5 Socio-economic Impact Modelling

### 5.1 Objectives

The objectives of the Socio-economic Impact Modelling Activity (activity 2.6) as stated in the EPOCH contract Attachment I (2003: 40) are to develop “models suitable to assist owners and managers of monuments, sites and museums to make business decisions on technological investments and to improve policy makers understanding of the necessary conditions for successful investment.

The Activity is related to that undertaken in Activity 2.8 where the emphasis is on the perspective of the commercial organisations seeking to make a commercial success over involvement in the sector.” The following summary shows how these objectives are being achieved in Activity 2.6.

### 5.2 Introduction

The final year of activity 2.6 has been devoted to three principal goals. The development of a **new model** for understanding socio-economic impact at the level of the city, **training** using the model and the **dissemination** of the results of the socio-economic impact research conducted by activity 2.6.

*Contribution to knowledge:* The study of socio-economic impact at cultural heritage sites is complex and requires a robust methodological framework for its understanding. The initial focus of the research conducted by Activity 2.6 has been the development of just such a methodological framework and models that can act as a platform for the study of the impact of information and communications technologies (ICT) at cultural heritage sites. The models have been developed through extensive, in-depth interviews with stakeholders at many cultural heritage sites across Europe. In the first year of EPOCH a site level model was developed, in the second an ICT investment appraisal model was developed, and in the third a training model was developed for disseminating the model to the sector. The contribution to knowledge in the fourth and final year of EPOCH has been the development of a prototype city model, in association with EAHTR (see Appendix 1).

*Training:* The model has been developed into a training package (the Heritage Impact Training model). This has been used to train cultural heritage professionals in a variety of contexts, at a variety of different levels. The model has been used at Heritage Impact 2007, VAST 2007 and the UNESCO symposium in Paris.

*Dissemination:* a key goal of the final year has been to disseminate the knowledge gained as widely as possible in the cultural heritage sector. This has been achieved through an extensive programme of conference presentations in Europe and North America, meetings, and the publication of two books (see Appendix 2-3).

### 5.3 Process

An overview of the process that has led to the creation of the EPOCH models is shown below. During the first year of the EPOCH project Activity 2.6:

- Established an understanding of the methodologies that could be used to measure socio-economic impact.
- Developed an understanding of the issues and challenges facing site managers through interviews and case study analysis.

- Using the data gathered a model conceptualising heritage site business processes at the site level was developed.

During year two:

- The holistic site model was tested at EPOCH's Heritage Impact conference
- This first holistic model was tested with heritage site managers
- Data was gathered relating to ICT investment decisions.
- An ICT investment appraisal model was developed

During year three:

- Initial testing was begun on the ICT model.
- Further development of the model to convert it into an appropriate training tool for the sector.
- The Heritage Impact Training tool was tested.

During year four:

- A model for city managers to conceptualise the heritage city has been developed.
- A case study was conducted using the historic city of Norwich.
- Extensive dissemination of the models was conducted

## **5.4 The set of models**

The EPOCH project has seen the creation of an extensive set of models that can be applied by those in the heritage sector, including:

### **5.4.1 Holistic site impact model**

The impact of ICT on heritage sites and their visitors is an *incremental* impact. That is to say it is an impact that occurs in addition to, and as part of the wider impact of the site. Therefore, changes to the dynamics of the site could affect the impact that an ICT deployment has. It is immediately apparent that the incremental impact of an ICT deployment cannot be viewed in isolation from the non-ICT context associated with a particular heritage site.

This is why the first model that has been developed (see Figure 1) towards the close of year one. The holistic site model seeks to understand and conceptualise the dynamics of the heritage site being studied. Hitherto, most impact studies have been conducted on a piecemeal basis, often focusing on one impact domain, employing a specific methodology. There seemed to be a lack of an overall impact model in the literature. The Activity 2.6 research forwards a coherent model for analysing socio-economic impact that hopefully will help heritage managers to frame their thinking about appropriate impact studies. This attempts to capture the complex, multi-dimensional nature of impact, the multiple influences on impact, and offers a guide to which impacts should be examined, given the specific circumstances of a cultural heritage site. In this way it also shows impact as a dynamic rather than static concept by highlighting management decision making and the impact context as

drivers of differential impact. In this sense impact can be seen as an ongoing process as well as a set of outcomes.

In the model four elements are considered to influence the impacts and outcomes of a heritage site. These are the site context, the vision and objectives, stakeholders and the management and decision-making context. Each of these primary elements comprises a number of sub-components. This model can be used by heritage site managers (and consultants and SMEs providing services to the sector) as a decision-making framework. It can be used by site managers as a stand-alone model to conceptualise their specific site and it provides a site ‘context’ for the second model which has been specifically oriented towards the deployment of ICT.

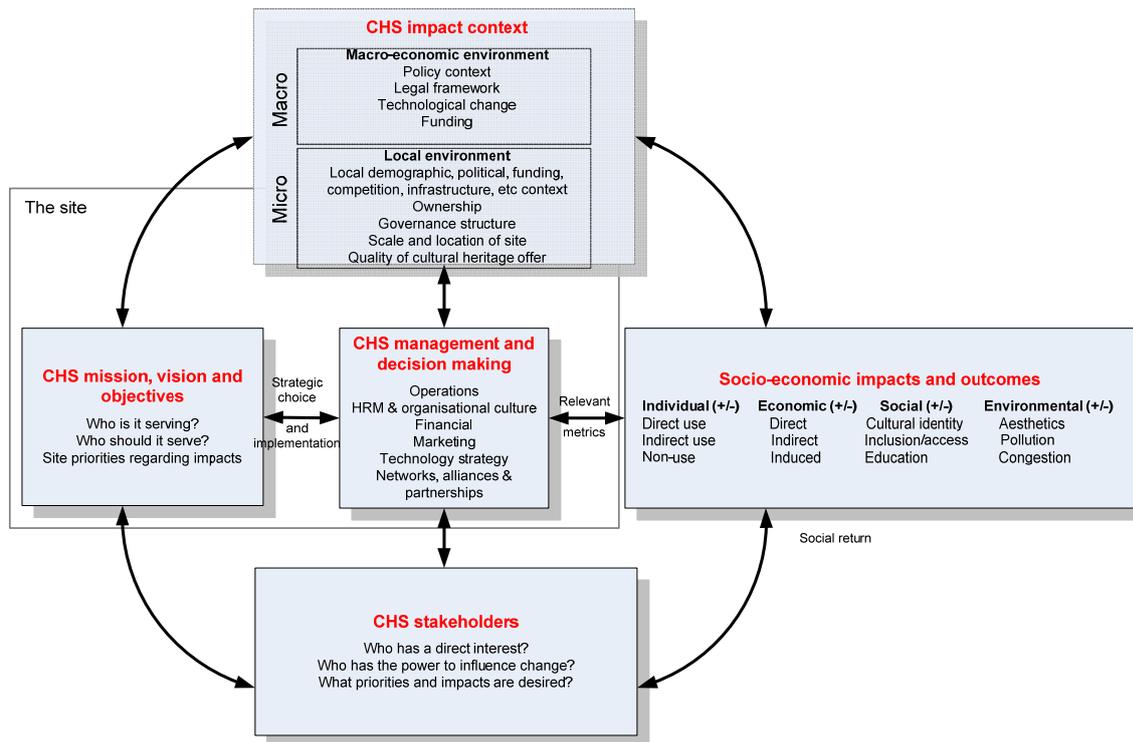


Figure 1: A dynamic holistic impact model for cultural heritage sites (CHS)

### 5.4.2 Holistic ICT investment and appraisal model

The second model proposed is the holistic ICT investment appraisal and deployment model (see Figure 2). This model considers what factors are likely influence impacts and outcomes associated with the deployment of technology at heritage sites. It is immediately apparent from this model that assumptions about impacts associated with specific types of ICT deployments are simplistic. The type of technology deployed is one of a number of factors that lead to impacts. It is this combination of the technology type deployed and the contextual factors that leads to the impacts. One cannot exist without the other. Therefore, those in the heritage sector who wish to influence the impacts and outcomes associated with an ICT deployment need to consider far more than just the technology type deployed. This is where the ICT deployment model will be of benefit to the cultural heritage sector.

In the Holistic ICT Investment Contingency Model four elements considered to influence impacts and outcomes. These are the technology context, the strategic rationale for technology investment, the specific objectives and appraisal of the technological investment, and the management decision-making context. As with the holistic site model this model can be used as a decision-making framework by heritage site managers, and all those providing

consultancy and services to the sector. As in the ‘real world’ these models are not linear but fully interactive.

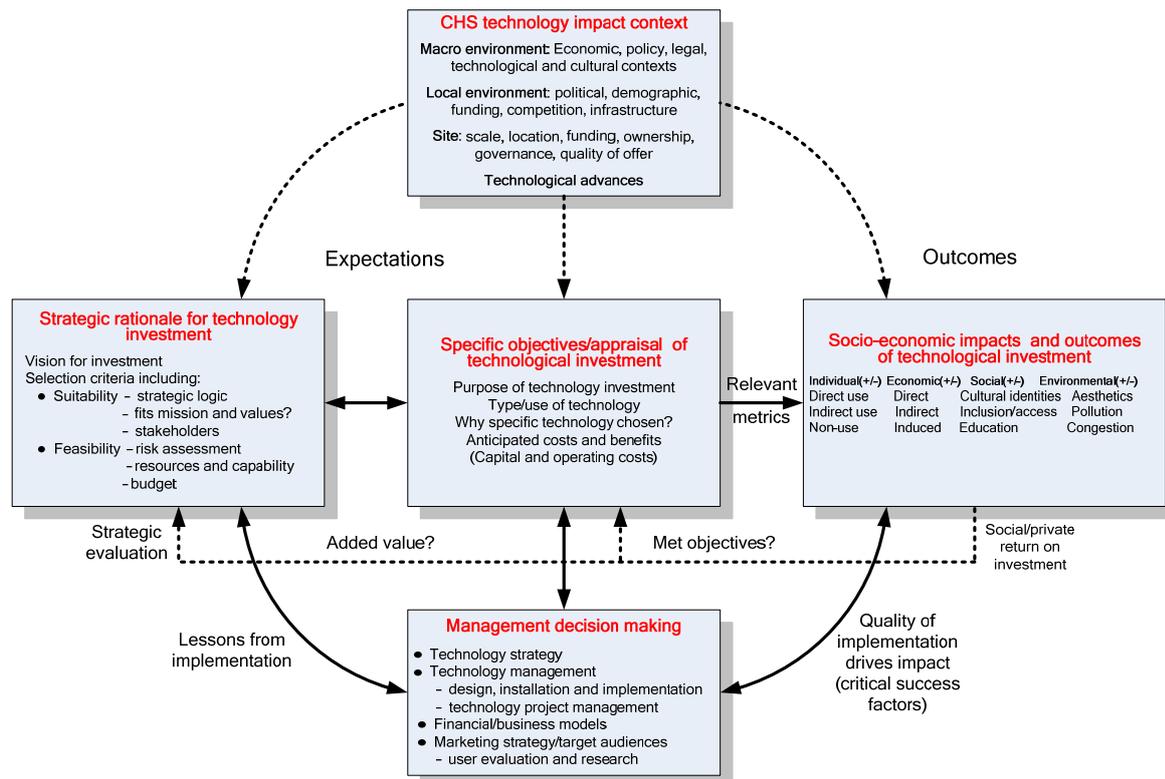


Figure 2: A holistic investment contingency model for technology impact evaluation at cultural heritage sites

The models revolve around the concept of what we call ‘dynamic impact’. The holistic models consider how multiple variables can potentially affect the impact of a site. For example, an analysis of how information technology affects the impact of a site would also look at other variables (such as marketing, implementation, human resources, stakeholders, etc) to consider if changes to these processes have contributed to impact. Impact studies currently do not usually account for changes in multiple variables. There is an assumption in many impact studies that the other elements of the heritage system have remained static. This type of assumption cannot be relied upon – the site needs to be conceptualised within a standardised manner so that impacts at different sites can be compared in a consistent manner.

### 5.4.3 The HIT (Heritage Impact Training) toolkit

The models also provide a framework which can be used to hang other tools for valuation and impact assessment. Activity 2.6 has begun work on linking the ICT investment contingency model with potential methodologies and techniques to aid valuation and impact assessment during and after the deployment. This could provide another useful tool for heritage site managers.

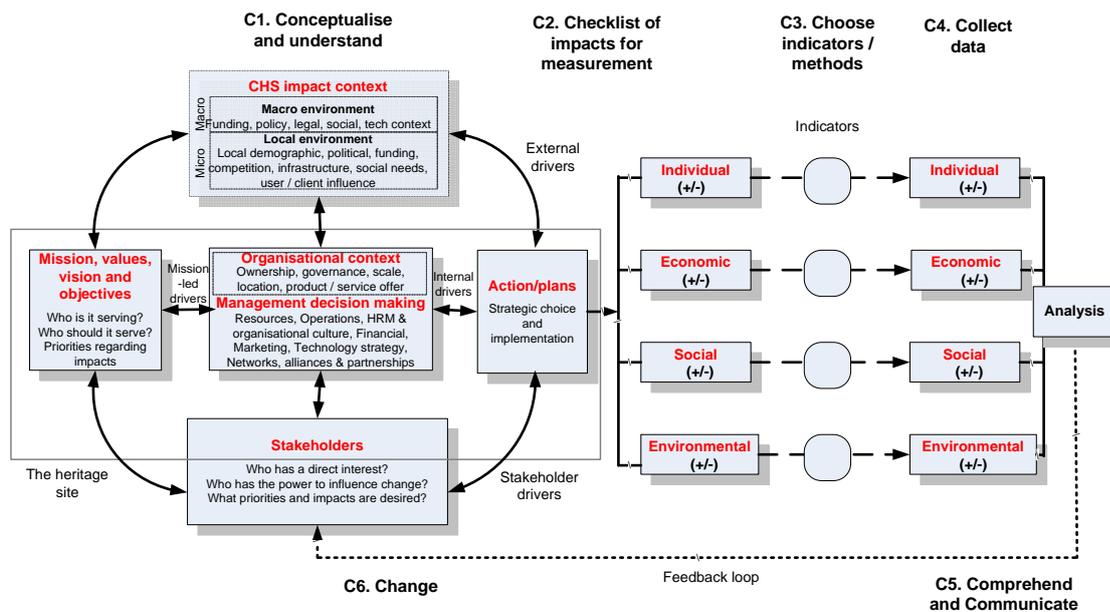


Figure 3: The Heritage Impact Training (HIT) toolkit

#### 5.4.4 The City Model

The ‘City Model’ represents the major contribution to knowledge from the final year of EPOCH. It is designed to help local authorities assess the social, economic and environmental impacts of heritage led regeneration and tourism development at the city level, and show how strategic policy can be modified to influence and improve impacts has been developed (see Figure 4).

The model explores the policy and delivery relationships operating within a city relating to Culture – Heritage – Regeneration – Tourism Development/ Destination Management in order to evaluate the extent to which the strategic potential of heritage to act as a catalyst for realising social, economic and environmental benefit is being fully exploited.

The concept of the city ‘evaluation’ model when fully developed presents local authorities and other key stakeholders with a practical mechanism to stand back and re-assess where a city’s overall policy making and delivery processes are at a point in time - particularly in terms of whether desired or

unexpected impacts are being realised in practice.

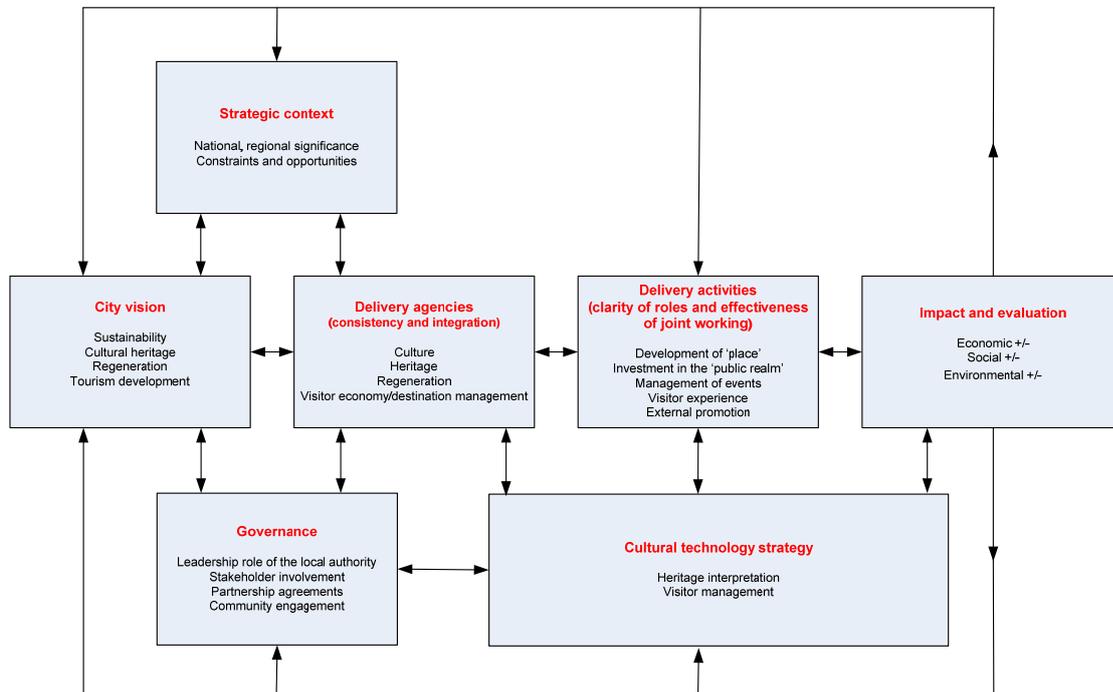


Figure 4: The draft city model, a heritage led regeneration and tourism development strategic policy impact and delivery evaluation tool

### 5.4.5 Overview

The models now fit together in the way shown in Figure 5: the holistic site model exists at the highest level; the ICT investment appraisal model can exist as a self-sufficient entity but is best used in conjunction with the contextual results derived from the application of the holistic site model. Both models lead to socio-economic impacts and outcomes. The three tier model hierarchy now provides a one-stop-shop for all elements of the heritage sector (city/region, site, and investment decisions).

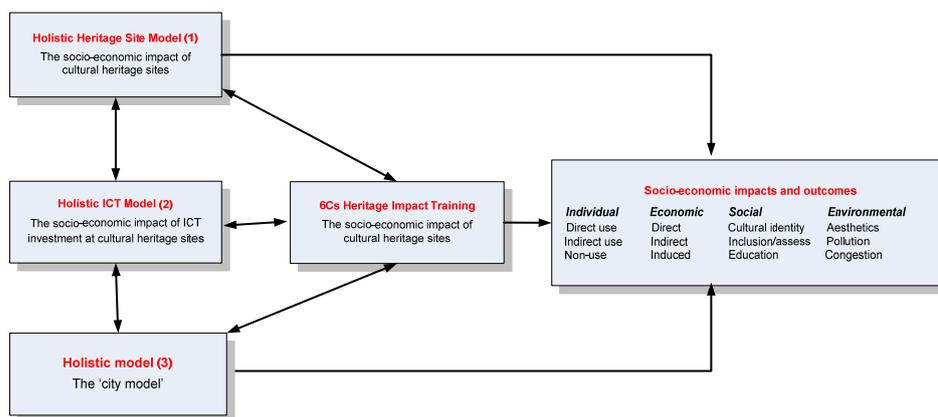


Figure 5: The relationship between the holistic impact models and impact/outcomes

The models have been extensively tested at heritage sites and are considered to be both academically robust and practically applicable to the end users in the sector. These models will be of benefit, not only to those with a specific interest in the application of ICT to heritage but to a much wider audience of heritage professionals (i.e. city managers, regional development offices, heritage site

managers, curators and directors who have to pursue heritage site strategy, and those providing outside consultancy to sites).

To-date, *all* heritage site managers questioned have felt that the sector lacks sufficient business skills. This we feel is crucial for the sector – there has been considerable research conducted in the academic arena that has not been applied to the sector. The dissemination conducted during this year has contributed to this goal (see Appendix 2-3)

The research is moving beyond the measurement of impact to the ‘understanding’ of impact. If the sector can begin to understand the processes involved in impact then sites will be in a better position to influence positive outcomes. If we can provide evidence of ‘why’ certain technologies are successful, in certain situations, then this information can be used directly by the sector and can be used to influence decisions both at the site level and policy level.

## **5.5 Training**

The model has been developed into a training package (the Heritage Impact Training model). This has been used to train cultural heritage professionals in a variety of contexts, at a variety of different levels. The model has been used to train members of the heritage sector at Heritage Impact 2007, VAST 2007 and the UNESCO symposium in Paris.

At Heritage Impact 2007 a morning was devoted to the training model. The audience was made up of practitioners from the heritage sector in the UK and Europe. At VAST 2007 a day was devoted to the training model with practitioners from across Europe. At the UNESCO roundtable in Paris, January 2008, high-level staff from UNESCO’s World Heritage department were trained using the HIT model.

The HIT model has also been disseminated in the EPOCH publication *Technology strategy, management and socio-economic impact* (McLoughlin, et al. 2007:17-42).

The model has also formed the basis for training in the social enterprise sector. After EPOCH one of the Activity 2.6 researchers will spend 6 months looking at the application of this training model for social enterprises in the UK.

## **5.6 Dissemination**

A key goal of the final year has been to disseminate the knowledge gained as widely as possible in the cultural heritage sector. This has been achieved through an extensive programme of conference presentations in Europe and North America, meetings, and the publication of two books (see Appendix 2-3). This process is continuing after the close of EPOCH.

In the 10 months between May 2007 and March 2008 activity 2.6 personnel gave 10 conference presentations in Italy, Spain, France, Greece and the UK, as well as Canada and the USA. This wide program of dissemination has led to the adoption of the models across three continents.

Two books have been published and one is forthcoming. Numerous papers have been published and distributed to libraries and heritage institutions across Europe.

The most important area for dissemination has been the EPOCH/UNESCO round table held at the World Heritage headquarters in Paris, on the 17-18 January 2008. This event attracted numerous UNESCO chiefs of regions and was very positively received (see Appendix 3). This has led to two developments in the post EPOCH period. A publication is in print in UNESCO’s World Heritage Papers series which highlights the key points and papers from the round table.

A network is currently being set up by EPOCH and the CUBIST Research Group under the aegis of UNESCO which will bring together the leading players in socio-economic assessment and apply their knowledge to World Heritage Sites. This is a long-term legacy of the EPOCH Project.

## **5.7 Continuation after EPOCH**

A number of the components of Activity 2.6 research will continue beyond the lifespan of EPOCH. Including:

- **Heritage Impact:** The ‘Heritage Impact’ conferences now provide a mechanism for practitioners and researchers interested in socio-economic impact in heritage to share ideas on the latest directions in impact research. In 2008 Heritage Impact will be joining with ATLAS (Association of Tourism and Leisure Education) as part of their first annual conference in the UK.
- **CUBIST Research:** The creation of the CUBIST (Cultural Business: Impact Strategy and Technology) research group by Activity 2.6 allows the EPOCH research principles to be extended into the wider cultural business field. CUBIST Research is continuing after EPOCH.
- **International research partnerships:** One of the key principles of a ‘Network of Excellence’ is the creation of research partnerships. The Activity 2.6 research, the Heritage Impact conferences, and the CUBIST research group all generate new and innovative research partnerships – most importantly the development of a network of interested sites under the aegis of UNESCO is a legacy that will continue after EPOCH.

## Appendix 1: ‘Towards a ‘City Model’ for heritage-led regeneration and tourism development’

The objective of this newly developed model is to help local authorities assess social, economic and environmental impacts of heritage led regeneration and tourism development at the city level, and show how strategic policy can be modified to influence and improve impacts

Brighton Business School in association with the European Association of Historic Towns and Regions (EAHTR)<sup>2</sup> has been exploring the development of an evaluation model at the ‘city-wide’ level. This is based on the holistic models created by as part of activity 2.6 and the EAHTR-led work on the INHERIT project guidance on successful urban regeneration through investing in heritage.

The Historic mediaeval city of Norwich is used as a case study to evaluate the potential components of an effective ‘city model’ that would assist local authorities and other stakeholders develop and modify strategy policy on regeneration and tourism development – by measuring and influencing key impacts.

The importance of effective governance and partnership arrangements is evaluated as part of the model and the benefits and uses of technology examined as a key factors in both heritage policy development and in enhancing visitor experience.

### **Background**

Historic cities are the context within which much of Europe’s cultural heritage is experienced by local communities and visitors alike. Heritage provides such cities with a unique identity and as such a potentially competitive advantage in attracting investment and securing the sustainable management of the historic city.

The concept of a ‘City Model’ that would help local authorities assess the social, economic and environmental impacts of heritage led regeneration and tourism development at the city level, and show how strategic policy can be modified to influence and improve impacts has been developed. The new city model combines and integrates where appropriate the work of INHERIT led by EAHTR<sup>3</sup> and the primarily site-specific modelling work developed in

---

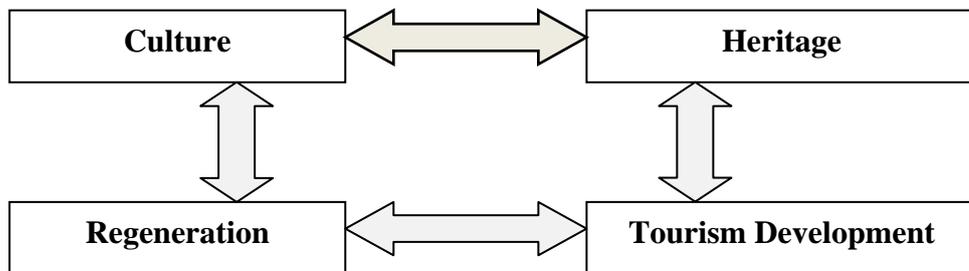
<sup>2</sup> The European Association of Historic Cities (EAHTR) was formed in 1999 as part of the Council of Europe’s campaign – ‘Europe a Common Heritage’ EAHTR has a membership spanning 28 European countries representing over 1000 historic and heritage cities. It aims to promote the interests of Europe’s historic cities through identifying and sharing good practice in the sustainable management of historic regions, cities, towns and villages.

<sup>3</sup> EAHTR has been lead partner in INHERIT an INTERREG 3C project which has produced guidance for local and regional authorities on ‘Investing in Heritage – A Guide to Successful Urban Regeneration (See [www.inheritproject.net](http://www.inheritproject.net)). INHERIT is an in - depth study of six European cities varying in size, location and cultural background but sharing a commitment to investing in their heritage as a key element in the regeneration of their city. The INHERIT project explores the value of heritage; looks at different approaches to heritage – led regeneration across 19 case studies and identifies the social and economic benefits that can be achieved. It has endeavoured to understand the underlying processes involved in investing in heritage and to identify the key ingredients leading to success.

activity 2.6 in order to explore the parameters of a model that would be an effective policy tool at the strategic level.

EAHTR selected and examined a pilot case study that could usefully provide initial insights to point the way forward for more in-depth research and development to be undertaken in the future.

The focus of the study is to explore the policy and delivery relationships operating within a city relating to Culture – Heritage – Regeneration – Tourism Development/ Destination Management in order to evaluate the extent to which the strategic potential of heritage to act as a catalyst for realising social, economic and environmental benefit is being fully exploited. For example, the relationships can be expressed interactively in the following way where an integrated set of consistent expressions of policy would be a prerequisite to the effective delivery of the desired outcomes and measurement of their impacts. The diagram is conceptual and not intended to give special emphasis to one element but rather to illustrate the inter-relations and interdependencies that need to be recognised and reflected in both policy development and delivery.



The first draft model is shown below and is used to provide a framework for ‘desk’ research and key stakeholder interviews in the selected city –the mediaeval city of Norwich in the UK.

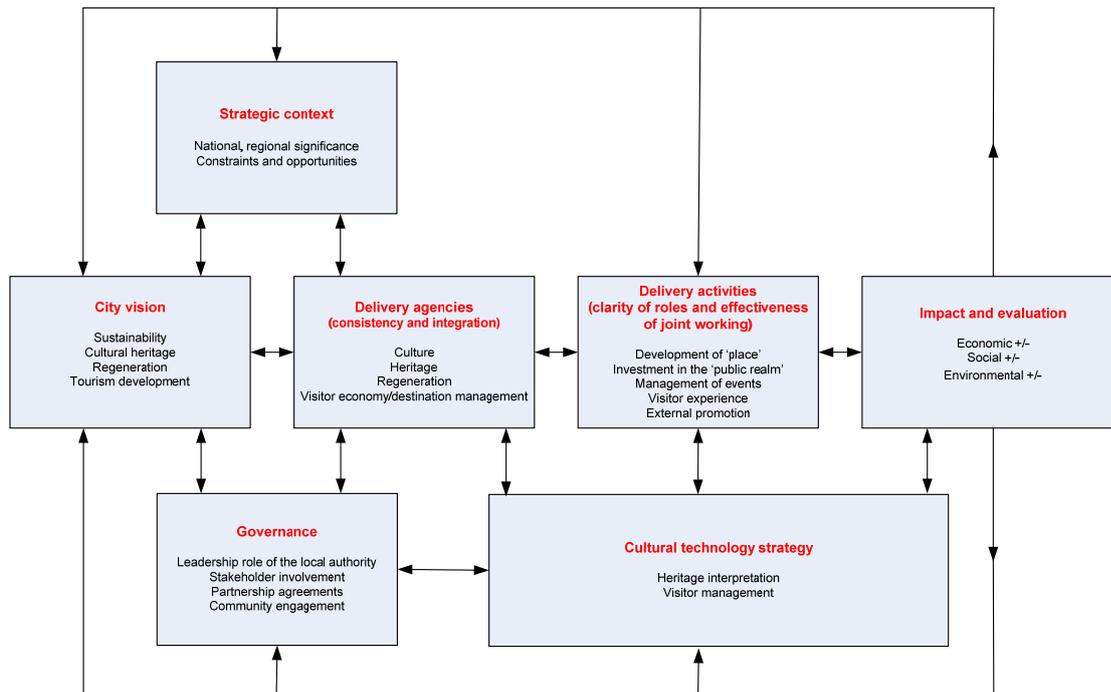


Figure 6: The draft city model, a heritage led regeneration and tourism development strategic policy impact and delivery evaluation tool

The component parts of the draft model are:

- Strategic Context
  - National, Regional significance
  - Constraints and Opportunities
- City Vision
  - Sustainability
  - Cultural Heritage
  - Regeneration
  - Tourism Development
- Governance
  - Leadership Role of Local Authority
  - Stakeholder Involvement
  - Partnership Arrangements
  - Community engagement
- Delivery Strategies (Consistency & integration))
  - Culture
  - Heritage
  - Regeneration
  - Visitor Economy /Destination Management
- Delivery Agencies (Clarity of roles and effectiveness of joint working)
  - Development of 'Place'
  - Investment in Public Realm
  - Management of Events
  - Visitor Experience
  - External promotion
- Cultural Technology Strategy

- Interpretation
- Visitor management
- Impact and Evaluation
  - Social
  - Economic
  - Environmental

The following key stakeholders were interviewed as part of this pilot study:

- Nikki Rotsos (Director of Culture, Norwich City Council)
- Mike Loveday (CEO of HEART - Norwich Heritage, Economic & Regeneration Trust)
- Michael Nutt (Managing Director, Visit Norwich)
- Professor Andy Day (Director Urban Modelling Group, University of East Anglia)

## ***City of Norwich – A Case Study***

### ***Strategic Context***

Norwich occupies an important place in English history and was England's second City until the eighteenth century. At the time of the Norman Conquest, Norwich was one of the most important boroughs in the kingdom, and even boasted its own Mint. The Normans built the Castle in 1067 and work began on the Cathedral in 1096.

Norwich's position – in the very centre of an essentially rural county – means that its size belies its significance to the region and lends it far greater importance than that enjoyed by many bigger cities. It has two cathedrals, 1500 buildings of architectural and historic interest, a world-class university and an internationally connected airport.

The Regional Economic Strategy for the East of England – 'A shared Vision' recognises Norwich's reach in terms of historic and heritage attractions and retail offer as being of regional significance and supports the urban renaissance of the city as a future priority. *The parallel Regional Spatial Strategy* confirms Norwich's regional role, quality of life, distinctive character and tourism potential supporting the promotion and enhancement of the heritage of Norwich reinforcing the image of a contemporary mediaeval city.

Norwich is set to see considerable growth over the next 20 years as its population rises from some 217,000 people in 2007 to around 280,000 people by 2025. This means 33,000 new homes need to be built and 36,000 jobs created. Growth of this magnitude needs to be carefully managed if the people of the city, the county and the wider region are to reap all the benefits that it can bring. Such growth must be both sustainable and responsible, allowing Norwich to grow and change, while nurturing the history and atmosphere that give the city its unique identity and character.

### ***Analysis***

The city is very clear about the context within which policy is framed at both the national and regional level. It faces a challenging period of significant growth ahead that represents both a potential threat to its identity and an opportunity to realise its full potential as the regional capital of the East of England.

## **City Vision**

The City Vision for Norwich is set out in the Sustainable Community Strategy for the city prepared by the City of Norwich Partnership. The overarching vision is: 'To make Norwich a world-class city in which to live, work, learn and play.'

## **Strategic Objectives**

The vision is structure into the following strategic objectives and themes:

### **Theme 1: City of Economic Growth and Enterprise**

- To help enterprise flourish
- To raise aspirations, skills and achievement
- To develop the right infrastructure for business

### **Theme 2: City of Environmental Excellence**

- To become a low-carbon city
- To minimise our use of global resources
- To become a model city for the management of the natural and historic environments
- To raise Norwich's profile

### **Theme 3: City of Culture and Creativity**

- To inspire people
- To create an environment where things can happen
- To improve quality of life
- To promote Norwich as a city of culture

### **Theme 4: City of Safe and Strong Communities**

- To reduce crime and anti-social behaviour
- To support families in crisis
- To reduce harm caused by alcohol
- To improve neighbourhood engagement

### **Theme 5: City of Health and Well-being**

- To reduce poverty and disadvantage
- To reduce the incidence of mental health problems
- To reduce health inequalities

### **Theme 6: City of Learning and Personal Development**

- To improve levels of educational attainment
- To boost aspirations of and opportunities for people of all ages

## **Analysis**

The city has a 'draft' new comprehensive vision that sets out its strategic direction up to 2020. It fully embraces the principles of sustainability and breaks the strategy down into manageable themes capable of delivery. The vision has been prepared by the 'Norwich Partnership' thereby involving not only the Local Authority but the full range of key

stakeholders across the private, public and voluntary sectors - supported by a series of 'round table' forums that provide further representative depth to the policy development process.

At the headline level, however, the themes and objectives do not explicitly reflect the central importance of cultural heritage to the city's identity and future prosperity or the importance of Norwich as an international, national or regional visitor destination. The detailed strategy does recognise the contribution heritage makes to the character of Norwich but makes no reference to the social or economic benefits of heritage led regeneration and treats heritage separately from culture. At a pragmatic level interviewees felt that there was sufficient 'hooks' to enable progress to be made and specific initiatives to be interpreted as falling within the umbrella of the strategy e.g. within the environmental objective 'To become a model city for the management of the natural and historic environments.

## **Governance**

Norwich City Council has a long tradition of providing effective civic leadership as the only elected body solely representing Norwich and has been instrumental in leading a number of innovative strategic partnership initiatives.

Within the context of government policy the Norwich Partnership has been established as a Local Strategic Partnership (LSP) representing all sectors and producing a new vision for Norwich – The Sustainable Communities Strategy –outlined above. This is currently a draft for community consultation.

Two delivery partnerships, relevant to this pilot study, have also been established. Firstly HEART, the Norwich Heritage Economic and Regeneration Trust and secondly, in partnership with other local authorities in the greater Norwich area, Visit Norwich –an agency established to promote Norwich as a visitor destination. Both of these organisations have a wide range of stakeholders involved in their respective governance arrangements.

## ***Delivery Agencies – Strategies and Activities***

### **Cultural Services – Norwich City Council**

Culture is treated as a key theme in the Sustainable Communities Strategy and the City Council has a lead department focusing on culture reflecting its priority within the council and wider community. Strategically the Council is represented on the national 'Cultural Cities Network' and regionally on 'Regional Cities East'.

Culture is defined by the city council as embracing heritage although the activities of the department do not include heritage buildings as a consequence of these functions having been 'outsourced' to a separate delivery agency. The concept of cultural heritage is seen as both the heritage of people as well the heritage of place.

A main focus of the department is promoting and organising events. The Event Team's role is to manage and develop a programme of community events and festivals and provide advice and support for the community and organisations that wish to organise events. The team also administers and oversees the hiring out of parks and open spaces within the city both for community and commercial activities. The 2009 programme covers a wide range of seasonal events throughout Spring, Summer, Autumn and Christmas including Art on the Railings, a

French Market, Lord Mayor's Celebration, Speciality Craft Market, Christmas Lights 'Switch On', Ice Sculpture Trail and New Year Firework Display

## **HEART**

The Norwich Heritage Economic and Regeneration Trust (HEART) was founded in 2004 by Norwich City Council. It is a private, charitable company set up to plan, regenerate, manage and promote the heritage resources in Norwich. The aims of HEART are to:

- To establish Norwich as the UK's premiere heritage city by 2012 and to achieve its recognition as an asset of universal value
- To establish HEART as an international leader in heritage-led regeneration by 2010

The Development Plan is the cornerstone of the HEART process since it is essentially about creating and developing the product. Without its integrated approach which changes the way the City's vast array of outstanding but fragmented and broadly unintelligible heritage resources are used and viewed, the other components of the HEART mission will not be deliverable. In essence the Development Plan aims to deliver:

- A unified product with mutually supporting components which can be marketed to a range of local, regional, national and international audiences for a variety of purposes – tourism, leisure, education, business/conferences.
- A rational device to co-ordinate and maximise the investment value of resources from supporting partner organisations (local, regional, national, international funders) and demonstrate tangible outcomes.
- A much more effective use of public space and heritage resources to deliver benefit to local people and support to the local economy by transforming a set of costly maintained liabilities into self sustaining assets.

## **The elements**

The HEART Management Plan established the principle of grouping heritage assets into three broad categories to facilitate better understanding of the overall resource and to enable more effective development of the potential products. The provisional categories were:

- **The Great and the Good** – Norwich's 12 most outstanding buildings representing a thousand years of urban development. These individually important but collectively unique buildings form the 'flagship' of the city's heritage offer.
- **The Strings of Pearls** – outstanding, thematic sets of heritage assets allied to significant themes in England's urban evolution. This concept allows the presentation of heritage assets in terms of people as well as themes such as heritage relating to belief – the 32 pre-reformation churches or to, for example, industrial heritage
- **Time and Space** – the evolution of the urban spatial network and specifically, a remarkable collection of heritage public spaces. This aspect of the plan reflects the importance of historic spaces both in terms of binding together otherwise disparate assets and the stage on which to develop outside urban activity.

HEART coordinates the Heritage 'Open Days' in the city where over 200 heritage assets are open to the public. The event is run nationally by the Civic Trust and English Heritage and the Norwich event currently holds the record for achieving the largest number of buildings open in England and Wales.

## **Visit Norwich**

Visit Norwich is the destination management organisation for the Norwich area (the administrative areas of Norwich, Broadland and South Norfolk), seeking to grow the visitor economy and build the profile and reputation of the destination. A private-public sector partnership, it started trading as a company limited by guarantee on 1<sup>st</sup> April 2005. VisitNorwich is essentially a membership organisation representing the interests of businesses both large and small across the visitor economy, and working on behalf of its members and stakeholders.

The VisitNorwich mission is:

- To make the Norwich area a competitive city area destination in domestic and international markets by developing, integrating and supporting all aspects of the visitor economy and attracting new investment, more visitors and increased spend; and
- To provide a resource to stakeholders for promoting and developing the tourism product and opportunities of the destination area:

VisitNorwich aims to make Norwich a competitive and compelling city area destination by focusing on:

- increasing staying visitors
- capitalising on assets
- engaging local residents
- developing year-round business

## **Tourism Strategy – Four Pillars**

The strategy for the Norwich area is based on four key pillars. These are:

### **Tourism – A Key Economic Driver**

This Pillar addresses how to support tourism enterprises as key growth platforms for Norwich and the surrounding area. The objective is to identify and support those businesses and business clusters that have the capability to succeed in terms of growth potential, quality and competitiveness; to integrate the City tourism offer with the sub regional offer, and to support inward investment.

### **Destination Making**

This Pillar addresses the “attractors”, infrastructure and services which the destination offers. The objective is to integrate these three areas into the overall offer to draw the market.

“Attractors” - The objective is to invest in excellence in those attractors that relate to the lifestyles of contemporary visitors and thus are capable of attracting high value visitors.

Infrastructure - The objective is to ensure that consumers and businesses have positive experience and that the city is accessible across information services, transport, and signage.

Services – the objective is to support those partnerships which will deliver a competent destination and boost visitor spending.

## **Brand and Marketing**

This Pillar addresses how a compelling brand and skilful and integrated marketing will ensure that Norwich and the surrounding area is a great place to live, work and invest – and to visit. The objectives of the City Destination Strategy are to define and build a powerful destination brand for the City, and to rationalise and harness integrated marketing using new media techniques, matching product offers and experiences to appeal to clearly defined customer segments.

## **A Skilled Community for the Visitor Economy**

This Pillar addresses tourism as a career, the professionalism of the industry, quality assurance and business skills and training. The objective is to encourage businesses that are capable of flourishing in the changing tourism environment and help to ensure that the skills that they need are readily available. This Pillar also addresses Performance Measurement. The objective is to set up systems for comprehensively and reliably measuring and assessing the performance of the tourism industry to the benefit of both operators and public sector agencies.

### **Analysis**

Norwich has established an innovative delivery infrastructure to nurture and promote its cultural and heritage assets and to develop its potential as a visitor destination locally, nationally and internationally. The approach adopted of creating ‘arms length’ agencies offers advantages in terms of access to funding sources, stakeholder engagement and expertise not necessarily available within more traditional delivery models.

While each individual strategy is strong in its own terms, however, there is little explicit integration in terms of how they each relate to the overall vision – the Sustainable Communities Strategy and to each other. The delivery inter-relationships between the three principle agencies is complex and overlapping to an extent in terms of responsibilities, for example in relation to developing the ‘product’, enhancing and managing the visitor’s experience, management of events and in improving infrastructure such as signage.

The ‘city model’ approach in facilitating a comparative analysis does show that cultural heritage could be more explicitly recognised and exploited at the wider strategic level by the principle agencies in Norwich in a more integrated way as a key asset and potential driver of social and economic benefit.

## ***Cultural Technology Strategy***

### **Heritage Interpretation**

The enhancement of the visitor experience is seen as a primary role of both the City Council and HEART partly through improved heritage interpretation. The City Council and HEART have been respectively successful in securing European funding from Interreg IIIB as part of the Spatial Metro project and from EEDA the Regional Development Agency.

The potential of technology is being fully realised through two innovative applications funded from Spatial Metro, the EEDA and HEART. Firstly the Urban Modelling Group at the University of East Anglia have been commissioned to develop extensive virtual reality

models of both the overall historic centre and individual heritage buildings relating to the ‘Great and the Good’ referred to above.

This work is nearing completion and will be made available in a number of outlets including web sites, visitor attractions and ‘smart’ interpretation signs. The aim is to better inform both the visitor and local community about the heritage assets of the city particularly where buildings are not physically open or accessible on a regular basis. The models have a wide range of potential applications including historic reconstruction of specialist interest to historians and academics and, linked to architectural CAD systems, as an aid to adaptation of historic buildings to sustainable new uses.

A set of twelve ‘smart’ interpretation signs relating to the twelve ‘Great and the Good’ buildings in Norwich are to be installed across the city centre in March 2008. These signs each include a hyper tag which can be swiped by mobile phone or PDA allowing access to interpretative information about each of the buildings. The sign for Norwich Castle is shown below.



## Visitor Management

VisitNorwich employs full use of web technology in fulfilling its visitor management functions. This includes promotion of a series of seasonal web-campaigns (Christmas, January Sales, St Valentine’s, half term, Easter, etc). It proposes the creation of a web development strategy to focus on search engine optimisation, web sales and revenue generation, content development and data capture.

## Analysis

Norwich is particularly advanced in exploring the benefits of technology relating to heritage interpretation at the city level. The two examples highlighted are about to be implemented and represent important and innovative developments in this field with considerable potential for wider application in historic cities across Europe.

## ***Impact and Evaluation***

The HEART Development Plan states that “unless we can show that heritage led regeneration is delivering serious benefits that are valued; heritage will continue to be regarded as a marginal issue”.

HEART has established key principles for developing a holistic approach to assessing the impacts of heritage led regeneration activity. While the “toolkit” that it has developed is intended as a guide for measurement, every situation will differ and to be effective, actual measures need to be customized to specific objectives of particular regeneration strategies. HEART also recognises that benefits flowing from the regeneration process will, in reality, not be capable of being allocated to just one category in most cases and a success in one category will inevitable result in successes in one or more others. HEART proposes to establish robust and measurable baselines which will then be advanced on an annual basis as appropriate.

The HEART Development Plan includes a range of objectives in terms of desired impacts with a number of detailed metrics proposed. At the higher level the outcomes desired include:

- More heritage information in a range of media
- More involvement in heritage activity
- More education/skills related activity
- Additional facilities available
- Additional economic activity
- More assets regenerated
- More visitors/spend
- More jobs created/sustained
- More festival activity
- More investment in the City
- Enhanced rentals
- Enhanced local awareness/ownership/citizenship
- Enhanced national/international visitor profile
- Enhanced profile in national/international media
- Influencing heritage regeneration internationally

Some innovative work is in the process of being completed relating measurement of the potential impact of the HEART Development Plan funded by the EEDA and commissioned from the New Economic Foundation. The approach taken has been to build on standard economic assessment by, for example, applying value to social benefit including factors such as local retention of tourism spend.

### **Visit Norwich Research**

Visit Norwich commission a range of market research including: Volume and Value 2004; county-wide ‘How’s business’ tourism survey’ Visitor Survey and Benchmarking research, Visitor Segmentation and customer origin analysis; Analysis of questionnaire in accommodation guide; benchmarking through Destination Performance UK Historic Cities Group.

## **Analysis**

The INHERIT project which examined good practice in heritage led regeneration across Europe found few examples in practice of local authorities monitoring results and/or quantifying the environmental, social and economic benefits of major heritage investment - although many fully recognise the need. The notable exceptions in the U.K. include the Grainger Town case study in Newcastle and the work of English Heritage in relation to heritage investment outlined both of which set targets and measure achievements. These correlate fairly closely to the metrics proposed by HEART, for example relating to:

- Jobs created and safeguarded
- Training programmes provided
- New business start ups
- Impact on visitor numbers and tourism spend
- Area of new/improved floor space
- Buildings improved and brought back into use
- New dwellings created
- Private and public investment attracted
- Amount of public realm improved.

The Norwich case study shows that the issues are being thought about and potentially addressed at the strategic level in terms of the work of HEART. All interviewees in Norwich expressed a common view that outcomes should form the basis of evaluating the impact of cultural heritage investment. In this context The New work Foundation research commissioned in Norwich, although not yet in the public domain, promises to contribute to the increasingly important area of developing a strategic ‘holistic’ methodology for evaluating the socio –economic benefits of heritage led regeneration.

## **Conclusions and future directions**

*This proto-type city model when applied to Norwich has consistently reinforced the positive aspects of the City’s innovative and creative approach to regenerating and promoting the city through extensive partnership arrangements engaging with a wide range of key stakeholders. It has also shown that there are issues that merit consideration in terms of refinement by the city’s leadership. For example there would appear to be a case for:*

- Reviewing roles and coordination mechanisms in developing and delivering cultural heritage led regeneration and destination management
- Looking at some rationalization and more integration and consistency in policy development and published strategies
- Aiming for unified and simplified benefit realisation outcomes ‘owned’ across the board extending beyond the work of HEART alone.

*The concept of the city ‘evaluation’ model when fully developed presents local authorities and other key stakeholders with a practical mechanism to stand back and re-assess where a city’s overall policy making and delivery processes are at a point in time - particularly in terms of whether desired or unexpected impacts are being realised in practice.*

EAHTR is convinced of the need to demonstrate in depth the value cultural heritage can make to deliver social, economic and environmental benefit and as such contribute positively

to the EU's primary objectives for 2008-2013 in relation to the Lisbon and Göteborg agendas on competitiveness and sustainability.

We see considerable potential, therefore, in further development of this model, as part of a package of measures aimed at redressing the relatively low priority and recognition given to the contribution cultural heritage can, and is making, to delivering the EU's strategic priorities. We are therefore actively considering options for building on this initial work, developed through EPOCH, including the submission of a Regional Initiative Project under the Interreg 4c programme 2<sup>nd</sup> call later in 2008.

## Appendix 2: Adoptions and applications of the model<sup>4</sup>

The final year of activity in Work Package 2.6 has focused on dissemination and training. The models developed by EPOCH have always been designed to be used by practitioners in the heritage sector. It is therefore reassuring that heritage site practitioners and managers are applying the EPOCH models. Such applications have been widespread and far beyond the original sites of development. They have come about as a by-product of the dissemination of the model through EPOCH publications and an extensive programme of conference presentations. Interestingly, it is noticeable that there is an increase in the applications of the model in the New World.

### ***Applications in Europe***

There have been the following known adoptions in Europe:

- The model was incorporated into a consultancy report for the Comunidad de Valencia which looked at the socio-economic impact of the CAC.
- Also, the model is being used in a Ph.D. thesis in the department of economics in the Universidad Politécnica de Valencia y Universidad de Las Palmas de Gran Canaria entitled: “Conservación de museos. Museología y cultura contemporánea” y convalidado de “turismo sostenible cultural: patrimonio tangible e intangible.”
- Most importantly, the model is one of the foundations for the new UNESCO high level network on socio-economic impact, the next meeting of which will be in October/November 2008. It is planned to co-develop a model with UNESCO that will assess the impact of World Heritage Sites.

### ***Applications outside Europe***

- Cleveland Museum of Art – are using the model to guide an IT deployment at the museum.
- University of Queensland – have used the model as the foundation for funding bid.

### ***Taught courses known to include the model***

- The model is planned to be taught in the University of Turino, as part of their new World Heritage masters level degree course. This was based on a recommendation from UNESCO stemming from the joint EPOCH/UNESCO roundtable in Paris (17-18 January, 2008).
- The model has been used as part of the “Planning and Management in Tourism” masters course by University of Valencia and the Spanish Network of Universities INTUR (the first course with the holistic site model took place on 14 February 2008).

### ***Other applications***

- *The SIMPLE Methodology*: The holistic site model has been adapted to form the basis of an impact assessment methodology for the social enterprise sector in the UK (called the SIMPLE methodology – Socio-economic IMPact on the Local Economy). One of the members of the activity 2.6 impact assessment team will be working with the SIMPLE model in the social enterprise sector in the 6 months after the close of EPOCH.

---

<sup>4</sup> These are applications of the model that are known to the authors, it is probable that the model is being applied in instances where it is not known to the authors.

The wide spread use of the models suggests that the structural principals of the models hold up to scrutiny. The range of different countries in which the models have been applied also indicate that the models are academically sound and are not limited by cultural differences.

## Appendix 3: Dissemination of socio-economic impact modelling through conferences

The final year of EPOCH has seen an extensive program of dissemination on two continents.

Date	Conference name	Location	Presentation	Speaker
<b>Forthcoming July 2008</b>	ATLAS annual conference 2008	Brighton, UK	City model	Presentation JM
<b>Forthcoming July 2008</b>	ATLAS annual conference 2008	Brighton, UK	Holistic model	Presentation BS
<b>Forthcoming July 2008</b>	ATLAS annual conference 2008	Brighton, UK	ICT model	Presentation JK (Chair)
February 2008	EPOCH	Rome, Italy	City model	Presentation JM
January 2008	UNESCO. The socio-economic impact of heritage: strategic planning, modeling and measurement,	Paris, France	Holistic model, HIT Model, ICT model	Presentation JM, JK, BS
November 2007	VAST 2007: The 8th International Symposium on Virtual Reality, Archaeology and Cultural Heritage	Brighton, UK	Monetising the value of the internet	Presentation JK
November 2007	VAST 2007: The 8th International Symposium on Virtual Reality, Archaeology and Cultural Heritage	Brighton, UK	HIT Model Training	Training JM, BS and JK
November 2007	Museums and the web	Chicago, USA	ICT model	Presentation JK
October 2007	International Cultural Heritage Informatics (ICHIM07)	Toronto, Canada	ICT model	Presentation JK
July 2007	The fourth international conference of science and technology in archaeology and conservation	Baeza, Spain	Holistic model	Presentation JM and JK
June 2007	Heritage Impact 2007	Brighton, UK	ICT model	Presentation JK
June 2007	Heritage Impact 2007	Brighton, UK	HIT Model Training	Training JM, BS and JK
May 2007	The evaluation of ICT applications in Cultural Heritage: Issues Methods and approaches	Mytilene, Greece	ICT model	Training/presentation JK

## **Appendix 4: Summary of feedback from the UNESCO/EPOCH socio-economic impact symposium, Paris, 17-18 January 2008**

UNESCO personnel:

“It was a great pleasure to meet you all and have these discussions. We would be pleased to have a follow-up and an integrated approach between your work on our work on economic impacts.”

*Dr. Mechtild Rössler, Chief, Europe & North America, UNESCO World Heritage Centre*

“I will keep in touch as I think there is a real need to seriously address these issues and bring them to a wide audience. I am now developing a proposal concept for a focused study. I have at the moment funding, but the caveat is that this funding would need to have a one to one match. Happy to brain storm with you on a strategy.”

*Art Pedersen, Head of Sustainable Tourism, UNESCO World Heritage Centre*

“It has been a pleasure for me to meet with you and your colleagues, and also to participate in such an interesting discussion ... Please do keep me informed of new initiatives on the same theme.”

*Giovanni Boccardi, Chief, East Asia and Pacific Unit, UNESCO World Heritage Centre*

“I was most happy about the 2-day meeting we had with EPOCH Specialists at UNESCO WHC last week. It is really very inspiring for WHC staff to listen about new ideas for our future work perspectives ... I thank you again for the valuable input EPOCH provided us on socio-economic impact.”

*Marielle Richon, Programme Specialist, Focal Point for Universities, UNESCO World Heritage Centre*

“It was a great pleasure to meet you on occasion of the very interesting meeting we had, and I confirm the interest of the Torino people to establish a contact with the EPOCH network. We are working on the launch of the Masters programme “World Heritage at risk” and in the coming days I shall send to all of you the contact details of the people in charge and information brochure of the draft course we are formalizing under UNESCO auspices, in the view of a meeting in Torino or Paris.”

*Dr Lodovico Folin Calabi, Associate Expert, Policy and Statutory Implementation Unit, UNESCO World Heritage Centre*