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Context

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WPLeader	MCC
Task 6.3	Strategy and future plans workshop
Task Leader	MCC
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HISTORY

Version	Date	Author	Comments
1.0	27/09/2012	Claire Loucopoulos	This version covers only Part I
2.0	12/10/2012	Antonella Fresa	This version includes both Part I and Part II
3.0	5/11/2012	Antonella Fresa	Final version submitted to EC

Table of Contents

EXECUTIVE SUMMARY

This deliverable is divided in 2 parts: the first part presents the proceedings of the strategy and future plan workshop, while the second part deals with harmonized policy elements.

The Part I of the deliverable aims at presenting the workshop on *Strategy and future plans* (Task 6.3) held in Paris, on the 7th of June 2012, and Part II presents the harmonized policy elements (Tasks 6.2) for the access to e-Infrastructures from the cultural heritage, which have been identified and agreed across the consortium.

The Paris workshop took place at the Centre de Recherche et de Restauration des Musées de France (C2RMF). The aim of the workshop was to discuss how better contribute to the harmonization of policies, both across the EU and in other partner countries, especially from the Mediterranean area, for the access of DCH community to e-infrastructures. Particular attention was paid to the discussion about the need to create a permanent exchange mechanism between the DCH community and the e-infrastructure community, to identify best practice examples, and to international cooperation.
The workshop was targeting cultural institutions and e-infrastructures providers.

The Part I is composed by 6 Chapters:

Chapter 1 illustrates the scope of the workshop

Chapter 2 provides the agenda of the workshop

Chapter 3 provides the abstracts of the presentations delivered at the workshop

Chapter 4 discusses the conclusions of the workshop

Chapter 5 provides a short biography of the speakers who delivered a presentation at the workshop

Chapter 6 contains the list of the attendees to the workshop

The Part II of the deliverable is devoted to the presentation of the results achieved by the project on the strategic future of the initiative. It aims to contribute with some elements to the harmonization of the policies in Europe and in the Mediterranean region concerning the exploitation of the e-infrastructures for the research in the domain of the digital cultural heritage. Projects with high impact were identified and taken into account as examples of best practice.

The Part II is composed by 4 Chapters:

Chapter 7 introduces to the scope of the work done in INDICATE about policies and future work

Chapter 8 presents the Paris Declaration which is the main outcome of the WP6 Strategies and Future Plans, which has been endorsed by the participants to the Workshop in Paris, illustrated in the Part I of this deliverables

Chapter 9 provides a commentary to the Paris Declaration

Chapter 10 illustrates the future plans that are foreseen to be followed by the INDICATE partners.

At the end of the Part I and Part II, the deliverable includes a final session about the conclusions of the work done in the project in WP6 about the Strategies and Future Plans for the sustainability of INDICATE initiative.

All the partners have been involved in the elaboration of the results produced by WP6.

PART I: STRATEGY AND FUTURE PLANS WORKSHOP PROCEEDINGS

1 Scope of the workshop

The Paris workshop was organized in the framework of the Work Package 6, "Strategy and future plans".

The general objectives of this WP are as follow in the Description of work:

"To contribute to the harmonization of policy, both across the EU and in other partner countries, as it pertains to

- International e-Infrastructures collaboration
- Access to e-Infrastructures by AHSS and e-culture initiatives
- Long-term AHSS plans and projects for e-Infrastructures ("opportunity" projects)
- Shared research agendas, joint funding models and resource allocation"

The WP 6 is composed of 3 main tasks:

a) analyzing current national policies and the e-Infrastructures environment: a questionnaire on the state-of-the art of strategies and mechanisms concerning the DCH with regards to the access of cultural heritage sector to the e-infrastructures was answered by the partners, and the results were presented in the D6.1 Policy overview and country profiles
b) harmonizing policy in the Mediterranean region
c) carrying out strategy and future planning: this was achieved through the organization of the Paris workshop

The targets were professionals from cultural institutions, e-infrastructure and research. The Paris workshop had 3 main objectives:

1. To assess elements for policy Harmonization
2. To carry out strategy and future planning for collaboration between e-infrastructures and cultural institutions
3. To validate the Paris Declaration: this is a text elaborated by the partners, on the basis of the D6.1, in which they commit for the future. This text will be presented during the Indicate final conference.

The INDICATE Strategies and Future Plans workshop took place in Paris on the 7th and 8th of June 2012.

In order to answer to the goals of the WP6, the workshop was divided in 3 sessions:

I. Introduction to the project and workshop
   Objective: to present the scope and functioning of the workshop to the participants

II. Cooperation between DCH and e-infrastructures
Objective: to present best practices examples

III. Two parallel sessions: one session dedicated to “involve e-infrastructures in policy and implement key indicators for DCH and e-infrastructure” and another one to establish common priorities.
Objective: to discuss and validate the Paris Declaration

The following chapters illustrate the agenda, the abstracts of the presentations, the conclusions of the workshops, the biographies of the speakers and the list of attendees to who participated to the workshop.

2 Agenda

Introduction to the Indicate Paris workshop

14:00 – 14:15 Presentation of the Indicate project
Antonella Fresa, Technical coordinator

14:15 – 14:35 Objectives of the workshop and general overview of the countries policies
Christophe Dessaux, Ministry of Culture and Communication, France

14:35 – 14:55 Efficient strategies and mechanisms favouring the access of the CH sector to e-infrastructure
Rosella Caffo, Ministero per i Beni e le Attività Culturali - Istituto Centrale per il Catalogo Unico delle biblioteche italiane e per le informazioni bibliografiche, Italy

Cooperation between Digital Cultural Heritage and e-infrastructures

Chair: *Borje Justrell, Riksarchivet, Sweden*

14:55 – 15:15 MuseID Italia
Sara di Giorgio, Ministero per i beni e le attività culturali - Istituto centrale per il catalogo unico delle biblioteche, Italy

15:15 – 15:35 Best practice example on preservation: Manuscripts in Turkey
Erhan Erkan, Turkiye Cumhuriyeti Kultur ve Turizm Bakanligi, Turkey

15:35 – 15:55 From the point of view of e-infrastructure
Sabrina Tomassini, consortium GARR, Italy

15:55 – 16:15 Questions and answers

16:15 – 16:30 Coffee break

International cooperation projects

16:30 – 16:50 CHAIN
Federico Ruggieri

16:50 – 17:10 ASREN
Salem Al-Agtash

Parallel workshops

17:10 – 17:50 Workshop session (discussion in small groups)

- Involving e-infrastructures in policy and implementing key indicators for DCH and e-infrastructure

Chair : Bayadir Aydinonat, Turkiye Cumhuriyeti Kultur ve Turizm Bakanligi - Rapporteur : Roberto Barbera, Cometa

- Establishing common priorities
  Chair: Salem Al-Agtash, ASREN – Rapporteur : Borje Justrell, Riksarchivet

17:50 – 18:10 Restitution of the groups – Chairs and rapporteurs

18:10 – 18:20 Questions and answers

18:20 – 18:30 Conclusions for the Paris declaration – Christophe Dessaux

3 Abstracts of the presentations

This chapter gives a general overview of the workshop content by providing an abstract of the speakers' presentations. All their slides are downloadable on the Indicate project website: http://www.indicate-project.eu/index.php?en/22/events-archive/76/paris-strategy-and-future-plans-workshop

The first session of the workshop aimed at introducing the project, the workshop objectives and the conclusions of the D6.1 on Policy presentation and analysis.

Antonella Fresa, as technical coordinator of the project, presented the **general objectives of the Indicate project**: to bring closer the digital cultural heritage field and e-infrastructures, so that they both know the advantages of working together, and to favour the transfer of knowledge between countries which already have experience in the implementation of policies related to e-infrastructures and DCH and other, with a particular focus on the Mediterranean area.

Then, **Christophe Dessaux**, Head of the Research, High Education and Technology Department at the French Ministry of Culture presented the **main objectives of the workshop,** as well as the results of the policy analysis presented in D6.1. This deliverable highlighted a considerable variability between countries regarding existing strategies and mechanisms favouring the access of DCH to e-infrastructures. Thus, the Strategy and future planning for the Mediterranean region will need to be flexible enough to account for the varied national contexts. A standard set of key indicators would be useful to compare progress in the area of DCH and e-Infrastructures between countries in the Mediterranean region in the future, and does not exist at the moment. The study also stressed the need to continue sharing best practices, and to favour transfer of knowledge between experimented countries and others. It was also highlighted that common objectives and priorities should be set up. Finally, Christophe Dessaux presented the main points of the draft of the Paris Declaration, which were discussed in the parallel sessions: a Strategic commitment to dialogue and collaboration between cultural heritage, ICT and e-infrastructures stakeholders, as well as future plans and perspectives.

Rosella Caffo, the general coordinator of the Indicate project, presented some **efficient strategies and mechanisms favoring the access of the CH sector to e-infrastructure**. She highlighted that it is necessary to focus on the use of existing e-infrastructures as a channel for delivery, access and preservation of digital cultural heritage data. Storage, computing, connectivity together with authentication, authorisation and accounting mechanisms offered by the e-infrastructures can well serve the needs of the sector. She stressed the need to establish factual cooperation among the three sectors (the research, the cultural heritage and the e-infrastructures) that are not used to work together. Projects such as DC-NET - joint activities plan for DCH e-infrastructure implementation; Indicate - international cooperation, use case studies, pilots, policy harmonization; DCH-RP - developing and validating a Roadmap for digital preservation(preservation had been identified as the first priority for cultural content providers) favor these collaborations, as well as the Joint Programming Initiatives (JPI) on cultural heritage

and global change. These collaborations opened the gate for the work towards an Open Science Infrastructure for Digital Cultural Heritage in 2020.

Three presentations were made for the session dedicated to concrete examples of cooperation between DCH and e-infrastructures.

Sara Di Giorgio, from the Italian Ministry of Culture – ICCU, presented the example of **MuseiD Italia**, the digital library for museums in Italy. The objective is to create an integrated area in CulturaItalia portal where the users can search and compare works from the collections of several museums and find information about permanent and temporary exhibitions. It is based on FEDORA commons, an integrated digital repository-centered platform.

Erhan Erkan, from the Turkish Ministry of Culture and Tourism, General Directorate of Libraries and publications, presented a project dedicated to the **digitization of manuscripts in Turkey**. Several digitization phases were done since 2001, upgrading hardware and software equipments. More than 100 000 manuscripts have been digitized and are accessible to the public on line. Tubitak Ulakbim provides the network infrastructure for Turkish Institutions and researchers. Turkish National Library is a member of the Turkish NREN (Ulaknet) and it is connected with a 8 Mb/s bandwidth. NREN, Grid connection possibilities will be explored more deeply, in particular for the issue of preservation.

Sabrina Tomassini, from GARR, the Italian Research and Academic Network, made a presentation from the point of view of e-infrastructures, on the role of e-infrastructures providers in the collaboration with Cultural Institutions, and shared experiences and challenges. NRENs can play a key role in supporting digital cultural content: by improving connectivity relating to access to high quality digital data (images, documents, video, music, etc) for researchers; by linking to the international community, also supporting current and new collaborations with partners in other regions; by building bridges between all e-Infrastructure layers, from Network up to end users, to develop common solutions. She also presented 3 examples of projects in DCH using the resources offered by e-infrastructures: museo Galileo, live performances, ASTRA…

Two international cooperation projects were also presented.
Federico Ruggieri, project Director at INFN presented the **CHAIN Project**, Coordination and Harmonisation of Advanced e-Infrastructure, co-funded by the FP7 of the European Commission. The project aims at defining a strategy and a model for external collaboration, in close collaboration with EGI.eu which will enable operational and organisation interfacing of EGI and external e-Infrastructures. Its objective is also to validate this model, as a proof-of-principle, by supporting the extension and consolidation of worldwide Virtual Research Communities, and finally to explore and propose concrete steps forward towards the coordination with other projects and initiatives. A MoU has been signed with the Indicate project, opening to further collaborations.

Salem Al-Agtash presented **ASREN, the Arab Stated Research and Education Network**. It is the association of the Arab region National Research and Education Networks (NRENs) and strategic partners, that aims to implement, manage and extend sustainable Pan-Arab e-Infrastructures dedicated for the Research and Education communities and to boost scientific research and

cooperation in member countries through the provision of world-class e-Infrastructures and E-services.

The last session of the workshop was dedicated to the discussion on the Paris Declaration.
Participants were divided into 2 groups, focusing on specific topics of the declaration.

The first goup discussed on **Involving e-infrastructures in policy and implementing key indicators for DCH and e-infrastructure**. It was moderated by Roberto Barbera, from Cometa.
It highlighted important topics that needed to be in the Declaration:

- Importance of the adoption of standards (e.g., SAML)
- Importance of interoperability of DCH repositories
- Importance of training

Key indicators should measure:

- the number of repositories and contents stored on e-Infrastructures (EGI and NGIs)
- types of contents and the number of DCH areas
- NGIs and number of of sites providing resources to DCH
- Size of the resources (e.g., Terabytes)
- the number of IdPs in the DCH community (e.g., libraries)
- the number of users registered in the e-Culture Science Gateway
- the number of joint events per year and the number of their attendees
- the number of joint publications

The second group, animated by Borje Justrell from the Riksarchivet, the Swedish National Archives, focused on the issue of **establishing common priorities**. The vision is that in ten years Cutural heritage resources should be possible to access and use by all, for open and transparent use and Shared R&D.
Targets are Culture Heritage institutions, ICT, Humanities, Arts and other sciences including use in higher education and E-infrastructures.
The system needs to be a system :

- matrix with CH, ICT, Human Art, e-Infrastructure
- R&D
- Validation
- Innovation

4 Conclusions of the workshop

The workshop held in Paris was an important step for the sustainability of the cooperation launched through the Indicate project, to continue investigating how the digital cultural heritage can exploit the facilities and services offered by the research infrastructures

During the workshop, results of the policy analysis were presented, highlighting the considerable variability between countries regarding strategies and mechanisms for access to e-infrastructures by digital cultural heritage.

The Paris workshop also gave the opportunity to exchange on good practices and collaborations between the digital culture heritage sector and e-infrastructures, and to give common trails for further cooperation.

This workshop highlighted that digital cultural heritage sector and e-infrastructures have common interests in working closely together, in Europe and beyond. It generates positive impacts:

- for e-infrastructures: The adoption of the e-Infrastructures by the digital cultural heritage community will open new scenarios of use and exploitation
- for the DCH community: cultural managers will access services provided by e-infrastructures such as storage, preservation, access services for the cultural institutions, etc.
- for the research community: they will benefit from new advanced services and application
- for other related sectors: Digital cultural content will become more usable and re-usable for education, cultural tourism, long-life learning, non-professional cultural interests, creative industry, etc.

The Paris workshop pointed out the importance of fostering international cooperation between digital cultural heritage and e-infrastructures, and with other networks in target regions: the Mediterranean region (Egypt, Turkey and Jordan), China and South America.

The Paris workshop was the opportunity to discuss and validate the Paris Declaration. It is a legacy of the project, where the partners commit to support collaboration between cultural heritage, ICT and e-infrastructures stakeholders.

The Paris Declaration is presented in details in the second part of this deliverable, dedicated to harmonised policy elements.

5 Speakers' biographies

Antonella Fresa: technical coordinator of the Indicate project, she is an ICT expert, working on European cooperation projects and policy development frameworks. She is also technical Coordinator of DCH-RP, EuropeanaPhotography, Linked Heritage, DC-NET ERA-NET, MINERVA series and MICHAEL series. Since 2002 she is advisor of the Italian Ministry of Cultural Heritage and Activities. She was Project Officer at the European Commission between 1999 and 2002, and previously policy advisor for the High Technology Network of the Tuscany Region, advisor of Italian and European organizations in the area of electronic publishing, e-learning, online services and applications.
She was also product manager at Tower Tech. Researcher at Olivetti Pisa, Ivrea and at the Olivetti Advanced Technology Centre in Cupertino (California).

Rosella Caffo is the General coordinator of the Indicate project. She is the director of the Central Institute for the Unified Catalogue of the Italian Libraries (ICCU) in Rome, which is an Institute of the Italian Ministry for Cultural Heritage and Activities. It is in charge of issuing, translating and customising rules and regulations for cataloguing library materials of all types, from manuscripts to multimedia, and to provide libraries with information and guidelines related to library standards. ICCU manages SBN, the National Library Service and union catalogue contributed by over 4500 libraries, MANUS; the national catalogue of manuscripts held by Italian libraries, EDIT 16, the national catalogue books printed in the sixteenth century.
She coordinates major digital cultural heritage projects on the national level, for example, Internet Culturale, which developed an integrated access portal to the digital resources of Italian libraries, archives and other cultural institutes, and CulturaItalia, the national portal on cultural heritage, the main Italian contributor to Europeana.
At European level she was the coordinator of projects such as MINERVA, MICHAEL, ATHENA DC-net , and she is the coordinator of INDICATE and Linked Heritage.

Christophe Dessaux is a civil engineer. He works at the Directorate for Development and International Affairs (Secretariat General) in the Ministry of Culture and Communication, France, where he is responsible for the Department for Research and Technology. This department is in charge of the co-ordination of Research in the Ministry, of the implementation of

national digitisation plan of cultural heritage, and of the European development of these activities (Minerva, Michael, Europeana). Christophe Dessaux is the French representative in the Commission's Member State's Expert group on Digitisation.
Since 2007, he is also president of the association Michael Culture, which is in charge of the sustainability of the MICHAEL project, and member of the Executive Committee of the EDL Foundation.

Sara di Giorgio is the Technical coordinator of the Italian Culture Portal named CulturaItalia, <http://www.culturaitalia.it/> that is the national aggregator of resources toward Europeana, created by the Italian Ministry of Cultural Heritage and Activities.
She participated and she currently involved in the activities of various working groups related to European projects on digitization of cultural heritage funded by the European Commission (MINERVA and MINERVA Plus, MEDCULT, ATHENA, INDICATE, DCNet, Linked Heritage, EUROPEANA AWARENESS).

Erhan Erkan is Head of Strategic Management Department of the General Directorate of Libraries and Publications, Ministry of Culture and Tourism, Turkey. He is responsible for three directorates; Strategic Planning Directorate, Data Processing Directorate, Measurement and Evaluation Directorate. He has started to work as a librarian in the National Library in 1988 and he worked in several positions
until 2003. Since 2003 he is working for the General Directorate of Libraries and Publications. He participated in many projects and organizations in several positions. He received BA in Librarianship from Hacettepe University.

Sabrina Tomassini is an expert in network infrastructure design and she joined GARR in 2007 as Senior Network Engineer. She is part of the Network Planning and Engineering team, that collects the user community requests for connectivity and plans technical solutions to implement them. In the position, Sabrina is currently following initiatives connected to Humanities and Cultural Heritage communities. She is also involved in GARR member and partner relations.

Dr. Federico Ruggieri is an INFN senior physicist and Director of Research in the INFN Section of Roma Tre. He spent most of his professional life working on On-Line and Off-line Computing Systems for High Energy Physics

experiments at CERN (The European Particle Physics Laboratory) and at Frascati, INFN National Laboratory.
From 1992 to 1998 chairman of the INFN National Computing Committee and was member of the HEPCCC (senior director computing co-ordination committee within major HEP sites in Europe) from 1994 to 2004 and Chairman from 1998 to 2002.
During his chairmanship he promoted the first GRID project co-funded by the European Commission: DataGRID.
He was from 1998 to 2004 the Director of CNAF in Bologna, the INFN National centre responsible for Research and Development of Informatics and Telecommunication Technologies where he designed and started the LHC TIER1 for Italy. He also played an important role in the development of the Networks for Research in Italy like INFNet the INFN Wide area network, and GARR the National Research and Academic Network. He was since the beginning nominated, by the Ministry of University and Research, member of the Scientific and Technical Committee of GARR and from 2000 to 2006 he was member of the Scientific and Technical Advisory Committee of GARR.
Since 2004 he is member of the Scientific and Technical Committee of CASPUR a Consortium of Universities and a Computing Centre for High Performance Computing. Since 1997 he is qualified expert in Informatics for the Italian Ministry of University and Research (MiUR).
In 2005 he led two projects co-funded by the European Commission VI Framework Program EUChinaGRID and EUMEDGRID and he is presently the coordinator of EUMEDGRID-Support project.
Since 2005 he is professor of Data Acquisition and Control of Experiments in the Laurea Magistrale in Physics of the University of Roma TRE.
Dr. Ruggieri has a list of more than 340 articles and publications in the domains of Physics, Data Acquistion and Information and Computing Technology.

Salem Al-Agtash got his Ph.D. in Electrical Engineering from the University of Colorado at Boulder in 1998. He is now an associate professor of Computer Engineering at the German-Jordanian University and a Senior Advisor on ICT and Technology. His research interests are in the areas of electricity markets, agent based energy systems, education, innovation, e-Infrastructure, industrial linkages and international cooperation.
Beyond his academic work, he is a consultant and advisor on several technology and education related projects.
During his academic career, he served as a department chair, founding director, founding dean, and besides his academic career, he currently works for the Arab States Research and Education Network, GmbH, a non-profit institution responsible for developing a sustainable Pan-Arab e-Infrastructure dedicated for research and education and connecting the Arab Universities and research centres.

Börje Justrell is director and head of the Information and Communication technology (ICT) Department at the Swedish National Archives. Previously he worked as a record manager, but is since 1989 responsible for technical matters at the National Archives. Justrell has been teaching archival science at the University of Stockholm for a number of years and has also been a member of international committees within the archivists professional association ICA.
He has been representing Sweden in expert groups on digitisation and digital preservation within the European Commission and has also worked in several EU projects like Minerva, MinervaPlus, PROTAGE (as coordinator), DC-NET and Linked Heritage.
Justrell has published articles and books on archival science and technical issues in Sweden as well as internationally.

Prof. Roberto Barbera is graduated in Physics "cum laude" at the University of Catania in 1986 and since 1990 he holds a Ph.D. in Physics from the same University. Since beginning of 2005 he is Associated Professor at the Department of Physics and Astronomy of the Catania University. Since his graduation his main research activity has been done in the domains of Experimental Nuclear and Particle Physics. He has been involved in many experiments in France, Russia, United States and Sweden to study nuclear matter properties in heavy ion collisions at intermediate energies.
He is author of about 90 scientific papers published on international journals and more than 150 proceedings of international conferences.
He is editor of the International Journal of Distributed Systems and Technologies and referee of both Journal of Grid Computing and Future Generation Computer Systems.
Since 1997 he is involved in the NA57 Experiment at CERN SPS and in the ALICE Experiment at CERN LHC. Since late 1999 he is interested in Grid Computing. He is member of the Executive Board of the Italian INFN Grid Project, of the Executive Committee of the Italian Grid Infrastructure (the Italian National Grid Initiative) and of the Scientific & Technical Committee of GARR (the Italian National Research and Education Network). Between 2005 and 2009 he has been the Director of two big Grid Projects (TriGrid VL and PI2S2) funded by the Sicilian Regional Government and by the Ministry of University and Research, respectively. At European level, he has been involved with managerial duties in many EU funded projects and he is currently the Coordinator of the EPIKH project and the Technical Coordinator of the EELA-2 project. Since 2002 he is the responsible of the GENIUS Grid portal project and, in 2004, he created the international GILDA Grid infrastructure for training and dissemination that he coordinates since the beginning.

6 List of participants

NAME	STRUCTURE
AL-AGTASH Salem	ASREN
AYDINONAT Hasan Bahadir	Ministry of Culture and Tourism, Turkey
BARBERA Roberto	Cometa
CAFFO Rosella	MIBAC-ICCU
CAGNOT Stephane	Dedale
DESSAUX Christophe	Ministry of Culture and Communication, France
DI GIORGIO Sara	Museo di Italia
ERKAN Erhan	Ministry of Culture and Tourism, Turkey
FRESA Antonella	Promoter
JUSTRELL Borje	Riskarschivet
KHOURI Ayman	CultNat
LOUCOPOULOS Claire	Dedale
MARCHAND Gaëlle	Dedale
NATALE Maria Teresa	MIBAC-ICCU
OZLUK Hakan Koray	Ministry of Culture and Tourism, Turkey
PICCINNINO Marzia	MIBAC-ICCU
ROMIER Geneviève	France Grilles
RUGGIERI Federico	CHAIN
TOMASSINI Sabrina	GARR

PART II: HARMONISED POLICY ELEMENTS

7 Introduction

The workshop described in the previous section aimed to validate the policy elements elaborated by the WP6 of INDICATE.

These elements were aimed to identify a common denominator, shared by all the partners and by the external participants to the workshop, in order to be offered to the Digital Cultural Heritage community as a basis for future cooperation.

The Harmonised policy elements have been synthesised in the “Paris Declaration”, a policy paper discussed and approved at the INDICATE workshop held in Paris on 7-8 June 2012.

The following chapters provide the text of the Paris Declaration, its commentary and an overview of the future plans agreed by the partners.

The Paris Declaration is provided online on the project’s website and promoted to the whole international community for endorsement. This is the first action of the future plans, launched at the Final Conference of INDICATE held in Ankara on 15-16 October 2012.

The text of the Paris Declaration has been thoroughly discussed at the final conference in Ankara, the final round table chairs by the representative of MCC was devoted explicitly to the Paris Declaration and all the participants to the conference signed it during the two days of work.

8 Paris Declaration

The members of the International Network for a Digital Cultural Heritage e-Infrastructure (INDICATE) at the Strategy and Future Plans Workshop in Paris on 7 June 2012, **adopt** the present Declaration:

8.1 Strategic Commitment to Dialogue and Collaboration

Our shared vision is that in ten years' time, access and use of digital cultural heritage should be available to all and that collaboration with the e-Infrastructures community will facilitate realisation of this vision. Dialogue and collaboration between cultural heritage, ICT and e-Infrastructures stakeholders offer important benefits for all sectors. We commit ourselves to a **strategic focus** on such dialogue and collaboration, and declare as follows:

a. That **Europe, Mediterranean, Middle East and the whole world is particularly rich** in cultural heritage with a diverse range of materials, subjects and sources. That they should grasp the opportunity to capitalise upon this patrimony through education, research, creative re-use, tourism and other applications.

b. That **dialogue and best practice** enable stakeholders across the sector to benefit from the experience and expertise of their peers. Common approaches to common challenges offer long term benefits in terms of cost efficiency, reduced technical obstacles, simplified collaboration and future joint activities.

c. That **open sharing and publication** of best practice is the appropriate response to public and private support of digital cultural heritage; openness enables the maximum value to be derived from research and development in the sector.

d. That best practice initiatives and further research should be **international** in scope and **supported** at all political levels – regional, national and international -, by Ministries and Institutions, in Europe and globally.

e. That **systematic action** which brings together e-Infrastructures, digital cultural heritage and ICT actors is key to progress in the digital cultural heritage sector. That central to this is effective communication and collaboration between the relevant ministries and agencies.

f. That **communication** across sectoral (cultural heritage, ICT, e-Infrastructures) boundaries underpins a shared understanding and appreciation of priorities, capabilities and constraints and is **strategically essential** for the further development of digital cultural heritage.

g. That **end users** (the public, researchers, students and others) should be represented in the planning and delivery of new services initiatives. **Training** of such end users is essential to raise awareness of the applications for e-Infrastructures in the digital humanities and to effectively achieve the full potential of e-Infrastructures and digital humanities collaboration.

h. That the opportunities and challenges facing cultural heritage in the digital age are **relevant across the globe**.

i. That demonstration and validation through **joint implementations and pilots** serve to stimulate effective communication, verify feasibility and acceptability of nominated best practice, establish shared understanding and encourage cross-sectoral perspectives.

8.2 Future Plans and Perspectives

Recent work in digital cultural heritage all around the world has led to important advances, not least in the nurturing of relationships with new partners in ICT and e-Infrastructures. There is excellent potential to build on this work in the future. We commit ourselves to pursuing further progress in the following areas:

a- The identification of **common priorities** for shared R&D and validation, involving stakeholders from the cultural heritage, ICT and e-Infrastructures sectors. These priorities will inform joint action plans for research and validation. Possible example focus points include preservation, geo-enabled services, end-user interaction, annotation and content creation, and semantic enrichment.

b- **Standards** and mechanisms to ensure **interoperability** of digital cultural repositories will be agreed and developed to facilitate shared use of digital culture by users from around the globe.

c- Establishing **shared research agendas and action plans**, in order to reduce redundancy and maximise the efficient use of resources across the sectors, across national boundaries and across initiatives, while still **respecting individual national contexts,** in terms of legal, social, cultural and economic priorities and constraints which may impact on collaborations.

d- Evolving **from theory to practice** by shared validation activities, pilots and implementations.

e- Promoting **greater use of e-Infrastructure facilities** by cultural heritage. Digital humanities represent an important user base for e-Infrastructures, including the application of e-Culture Science Gateways, repositories, interfaces, and other facilities. This will underpin the exploitation of cultural heritage material as outlined in the *Riding the Wave*[1] report.

f- Taking into full consideration **related initiatives** at a national and international level, including Europeana and its ecosystem of projects, national cultural portals, other national and international research and innovation initiatives and also local and organisation-centred projects.

g- Developing the national and international **policy contexts** which facilitate the collaboration of digital humanities, ICT and e-Infrastructures stakeholders. This includes the recognition of the humanities as an important target for e-Infrastructures technology and services. The involvement of humanities stakeholders in setting out roadmaps for the development of e-Infrastructures is an important enabler in this context.

h- **Securing** our digital patrimony through research and validation in long term preservation, while **enhancing** social benefit through access, interaction and enrichment services.

i- Maintaining and stimulating the **growth of the International Network** by encouraging new members, demonstrating tangible benefits and proactively engaging with actors from all three key sectors.

j- Further development of **global relationships** through deeper engagement with existing partners in Africa, Asia and the Americas, as well as new outreach to cultural stakeholders across the globe. Our vision is of global shared activities and agendas in a manner similar to those developed within Europe.

[1] http://cordis.europa.eu/fp7/ict/e-infrastructure/docs/hlg-sdi-report.pdf

8.3 Measuring Progress to Ensure Success

As best practice evolves and demonstration and validation are achieved through joint implementations and pilots, we need to measure progress in key areas by implementing indicators, such as the growth of digital cultural heritage presence in e-Infrastructures, capabilities of e-Infrastructures to support digital cultural heritage, uptake of e-Infrastructures by digital cultural heritage end users and dissemination of the use of e-Infrastructures by the digital cultural heritage community**.**

8.4 Signatories

ICCU - Istituto Centrale per il Catalogo Unico delle biblioteche italiane e per le informazioni bibliografiche, Italy

GARR - CONSORTIUM GARR, Italy

COMETA - COMETA CONSORZIO MULTI ENTE PER LAPROMOZIONE E L'ADOZIONE DI TECNOLOGIE DI CALCOLO AVANZATO, Italy

MCC - MINISTERE DE LA CULTURE ET DE LA COMMUNICATION, France

NTUA - NATIONAL TECHNICAL UNIVERSITY OF ATHENS, Greece

I2CAT - FUNDACIO PRIVADA I2CAT, INTERNET I INNOVACIO DIGITAL A CATALUNYA, Spain

CULTNAT - CENTER FOR DOCUMENTATION OF CULTURAL AND NATURAL HERITAGE, Egypt

DOA - Department of Antiquities, Jordan

SGB - Türkiye Cumhuriyeti Kültür ve Turizm Bakanlığı, Turkey

AAS - AAS AVTORSKA AGENCIJA ZA SLOVENIJO DOO, Slovenia

9 Commentary to the Paris Declaration

Digital cultural heritage (DCH) is a powerful means to perpetuate the rich cultural heritage of Europe, and indeed globally, by preserving cultural content for future generations and removing barriers between cultural heritage and its varied users. However, there are many different challenges faced by DCH organisations, including the high cost of durable data storage for large repositories and effective searching of vast quantities of digital cultural content. e-Infrastructures can provide solutions for the array of challenges faced by the DCH community. However, many DCH organisations remain unaware of the services provided by existing e-Infrastructures.

9.1 Background

In 2001, experts and representatives of Member States of the European Union (EU) met to discuss the digitisation of cultural assets. The meeting resulted in the Lund Principles, which highlighted the **value and importance of digitised cultural content**, identified obstacles to realising the full potential of digitised cultural resources and recommended actions that should be taken by Member States and the European Commission to overcome these obstacles. The Lund Action Plan (2001-2005) detailed key activities to improve the digitisation of cultural content in Europe and to achieve the objectives laid out in the Lund Principles. The Dynamic Action Plan followed the Lund Action Plan in 2005. The Dynamic Action Plan reaffirmed the continued validity of the Lund Principles and identified actions to address key continued challenges in the DCH field.

Since initiation of the Lund Action Plan, DCH in Europe has been advanced by a number of projects and initiatives, including the MINERVA[2] project, started in 2002, which sought to establish recommendations and guidelines for the DCH community and the MICHAEL[3] project, started in 2005, which examined DCH data models, organisation and governance.

A key challenge in the DCH field is providing widespread access to digital content. The European Digital Library Network (EDLnet) project created a virtual European library with the aim of making European cultural heritage accessible to all. EDLnet produced a prototype digital library that proved to be enormously successful. A fully operational version of the EDLnet prototype was then developed through the Europeana version 1.0 project. The Europeana[4] portal was launched in 2009 and currently serves as a single access point for European digital culture, providing multi-lingual access to over 23 million objects from more than 2,200 institutions in 33 countries. Since the inception of Europeana, the ATHENA[5] project has focused on establishing standards and guidelines for harmonised access to digital content through Europeana. Currently, the Linked Heritage[6] project is facilitating the contribution of large quantities of new content to Europeana.

As the size of Europeana and other digital cultural heritage repositories has grown, challenges related to data processing, storage capabilities and cost have become more evident. e-Infrastructures, which have been widely used by other sectors such as the physical sciences, can provide solutions to these challenges and create opportunities for the generation of new knowledge.

e-Infrastructures support a *'new way of doing research'*[7] which enable researchers to tackle complex challenges and collaborate globally in innovative ways. High speed connectivity, Grid computing,

[2] www.minervaeurope.org
[3] www.michael-culture.org
[4] www.europeana.eu
[5] www.athenaeurope.org
[6] www.linkedheritage.eu
[7] http://www.beliefproject.org/about-e-infrastructures/what-are-e-infrastructures

supercomputing and global collaboration through virtual networks are all facilitated through e-Infrastructures. Within the Mediterranean and Middle East, network infrastructure is provided by EUMEDCONNECT. EUMEDCONNECT is connected to international counterparts, such as GÉANT2 in the EU, ALICE in Latin America and TEIN2 in the Asia-Pacific region, thereby allowing a truly global network for research. Users connect with EUMEDCONNECT through their local National Research and Education Network (NREN), which are specialised providers dedicated to meeting the needs of national research and education communities.

The relationships between DCH and e-Infrastructures have been explored by two sister projects: Digital Cultural heritage NETWORK (DC-NET) [8] and International Network for a Digital Cultural Heritage e-Infrastructure (INDICATE).[9] The goal of the INDICATE project was to coordinate policy and best practices for the use of e-Infrastructures by the DCH community in the Mediterranean region. A network of common interest composed of experts and researchers from e-Infrastructures, DCH and ICT domains was established to share experience, promote standards and guidelines, seek best practices and policy harmonisation, and to transfer knowledge from DCH organisations experienced with the use of e-Infrastructures to those with less experience. INDICATE also carried out practical experimentation through pilots and use case studies using the policies and best practices identified by DC-NET, which explored the available e-Infrastructures in Europe, described the policies, programmes and regulations related to e-Infrastructures, as well as the current standards in the area. The Paris Declaration, adopted by the INDICATE partners on 07 June 2012 at the Strategy and Future Plans Workshop, details the future priorities and commitments of the network beyond the lifetime of INDICATE. The shared vision of the INDICATE network is that in ten years' time, access and use of digital cultural heritage will be available to all and that collaboration with the e-Infrastructures community will facilitate realisation of this vision.

There are a number of key stakeholders in the area, from both DCH and e-Infrastructures spheres, including:

- Policy makers - ministries responsible for DCH and e-Infrastructures policy, national/European/international policy groups (e-Infrastructure Reflection Group (e-IRG), [10] European Strategy Forum on Research Infrastructures (ESFRI), [11] etc.);
- Memory institutions - museums, archives, libraries, galleries, etc.;
- End-users - educators, researchers, members of the tourism and creative industries, "citizen scientists".

Over the course of the INDICATE project, current best practices have been identified through pilots and use case studies, and disseminated to the larger DCH community. However, the work of INDICATE will continue beyond the project lifetime as outlined in the Paris Declaration. The INDICATE network of common interest has identified a number of key areas for future dialogue and strategic development in the area of access and use of digital cultural heritage through collaborations with the e-Infrastructures community, and has declared its commitment to pursue further progress in a number of key areas through dialogue and collaboration between cultural heritage, ICT and e-Infrastructures stakeholders, as outlined in the following sections.

[8] www.dc-net.org
[9] www.indicate-project.eu/
[10] http://www.e-irg.eu/
[11] http://ec.europa.eu/research/infrastructures/index_en.cfm?pg=esfri

9.2 Advancing and Preserving European Cultural Heritage

Europe is particularly rich in cultural heritage with a diverse range of materials, subjects and sources. In Germany, France, Spain, Switzerland and the United Kingdom alone there are over 11,800 museums.[12] Europeana currently contains content from over 2,200 institutions. Furthermore, Europe is home to areas of particular cultural richness, such as Paris, Rome and Athens. Europe should grasp the opportunity to capitalise upon this patrimony through the following applications, among others:

- **education** - educators can access a much broader range of cultural heritage from DCH sources than what may be accessible locally by non-digital means and build learning resources tailored to their individual curricula and learner base; the digital nature of the cultural materials means that they can be easily re-purposed by educators for a variety of audiences;
- **research** - researchers in the Humanities can benefit from easier access to materials related to their research interests from across Europe and discover new cultural information using digital-based tools, such as semantic search of large digital repositories; digital manipulation allows large, complex collections to be effectively visualized; virtual exhibitions bring related cultural material from different geographical locations together to facilitate comparison and analysis; virtual research communities can be created to combine annotation, discussions, social networking and digitisation;[13]
- **creative re-use** - the creative industry can re-use digital cultural content in a variety of different ways, including applications as diverse as using 3-D renditions of historic ruins for creating film sets to costume design for re-enactments;
- **tourism** – *"culture and tourism have a mutually beneficial relationship which can strengthen the attractiveness and competitiveness of destinations, regions and countries"*[14]; tourists and tourism promoters can derive value from digital cultural resources, such as the provision of geo-coded cultural information through tourism portals and virtual exhibitions to reduce barriers of access for those unable to travel,

Long-term preservation of European cultural heritage is another key aspect of digital cultural heritage and was the focus of an INDICATE case study. Long-term preservation will ensure that digitised cultural content will remain accessible to future generations. Digital obsolescence is a key challenge for long-term preservation. As digital technology evolves and existing software or decoding technology is abandoned or hardware devices are no longer in production, records created with these obsolete technologies can be lost, simply because they are no longer accessible. To avoid the need to repeatedly digitise content, long-term preservation of digital cultural data is essential.

Digitisation is also a way to preserve records of vulnerable cultural materials, such as ancient texts and textiles. Digitisation not only preserves a digital representation of the content, it also allows a wider access and use of the material today than would otherwise be possible due to measures required to preserve the fragile materials. Protection and access of digital cultural content through agreed standards, federated

[12] www.egmus.eu
[13] Such as those being developed in the CULTURA project (Cultivating Understanding and Research through Adaptivity) - http://www.cultura-strep.eu/
[14] The Impact of Culture on Tourism - http://www.em.gov.lv/images/modules/items/OECD_Tourism_Culture.pdf

approaches, and high-performance scalable computing infrastructures will **ensure long-term access to digital resources for researchers, educators and citizens**.

9.3 Open International Dialogue

The INDICATE network of common interest believes that **dialogue and sharing best practices** will enable stakeholders across the sector, both within Europe and around the world, to benefit from the experience and expertise of their peers. During the INDICATE project, a number of common challenges, such as a lack of global long-term preservation policies and security for the protection of digital repositories, were identified. In some countries, effective approaches to address such challenges had been identified and implemented, while in others the challenges still remained unaddressed. Open dialogue and sharing best practices is an effective way to identify common approaches to common challenges and offers long term benefits in terms of cost efficiency, reduced technical obstacles and access to e-infrastructures for non-expert users, simplified collaboration and future joint activities.

One of the benefits for cultural institutions of engaging with other European and global DCH partners, is the possibility of sharing digital content. For example, sharing digital content can help cultural institutions to better fulfil their research goals or "complete" collections with missing cultural content. **Interoperability is key for aggregation of content from diverse sources**. There is a risk that proprietary and/or national standards can prevent interoperability and negatively impact the aggregation of digital cultural content. This is especially evident in the case of Europeana, where significant effort is required to extract and harmonise metadata from the many different content systems that contribute to the portal. Open technologies that are available to users around the globe and support durable and persistent access to digital data, such as DSpace and FedoraCommons from DuraSpace,[15] are well positioned to ensure current and future access to our shared digital cultural patrimony. Identifying and supporting systems with international and inter-institutional interoperability is therefore essential in the context of global DCH initiatives, and will be a particular focus of international dialogue facilitated by the INDICATE network in the future.

Furthermore, funding for digital cultural heritage arises from a number of sources, both public and private. Therefore, **open sharing and publication** of best practices and digital cultural content is also appropriate. Openness also enables the maximum value to be derived from research and development in the sector and will protect cultural content for future generations.

While INDICATE focused on establishing a dialogue within the Mediterranean region, it is envisioned that the network of common interest established during the project will be sustained and expanded to include other European and international members in the future, allowing a wider dialogue and stronger global cooperation. Strong collaborative links have already been forged with members of the DC-NET[8] consortium, a sister project to INDICATE involving partners from complementary European countries. Further development of **global relationships** will be achieved through deeper engagement with existing partners in Africa, Asia and the Americas, as well as engagement with new cultural stakeholders across the globe. **Related initiatives** will be considered at a national and international level to better inform researchers, educators and citizens on a global scale. Initiatives include Europeana and its ecosystem of projects, national cultural portals, and other local, organisation-centered innovation initiatives. This means that

[15] www.duraspace.org

future research and new best practice initiatives can be **international** in scope and will be **supported** both by Member states and at the European level.

Our vision is of global shared activities and agendas similar to those developed within Europe to address issues such as training, copyright, sustainability, storage, data integrity, descriptive standards, accession, etc. In addition to identifying current best practice, dialogue and interactions between members of the DCH, e-Infrastructures and ICT communities will serve as stimuli for the formulation of new ideas and drive innovative research. Such interactions are also a potential source of new collaborations between partners who would not have met otherwise. Key to this communication is the establishment of **shared research agendas and action plans** in order to work efficiently across national boundaries and across initiatives. This will reduce redundancy in research projects and maximise the use of the best practices and resources across the sectors. It will be important to **respect individual national contexts**; in particular, legal, social, cultural and economic priorities and constraints will need to be respected.

9.4 National and European Support

In the European arena, DCH is seen to add value in a number of contexts. Digitisation turns cultural material *"into a formidable asset for the individual user and an important building block for the digital economy."*[16] The potential areas for economic growth in related industries are broad, ranging from the development and provision of new digitisation technologies to the generation of innovative applications in the tourism and creative industries. DCH also enhances the quality of life of Europeans in a myriad of ways, such as contributing to education, linking the past to the present and enabling citizens to appreciate their rich and diverse common heritage. Ultimately, a concerted European approach is needed as the challenges faced by DCH are common across Europe. There is significant European support for DCH as a result of the economic opportunities it creates and potential enhancements to the quality of life of citizens. For example, DCH, e-Infrastructures and related ICT research and best practice network projects (Linked Heritage, INDICATE, DC-NET, CULTURA, etc.) are currently supported by the EU through Framework 7 Programme funding. In addition, there are a number of EU initiatives (e.g. Joint Programming Initiative on Cultural Heritage) and policies (e.g. Digital Agenda, etc.) which support and promote DCH. There is also support at the national level, though a variety of initiatives and policies, such as the Austrian Digital Heritage Initiative.[17]

Furthermore, there is significant support for establishing best practices for the use of e-Infrastructure for DCH, at national and European levels. Sharing best practice reduces the cost of initiatives as it eliminates duplication of effort and allows for replication of success across Europe. In the case of establishing best practices, larger networks that encompass more countries increase the potential quality and applicability of the identified practices. Therefore, expanding the INDICATE network beyond Europe will only increase the benefits of sharing best practice.

9.5 Ensure Progress by Systematic Action

Increased, strategic use of e-Infrastructures by the DCH sector will be best promoted and supported by **systematic actions** that bring together e-Infrastructures, DCH and ICT domains. Communication across the

[16] The New Renaissance, Report of the Comité de Sages - http://ec.europa.eu/information_society/activities/digital_libraries/comite_des_sages/index_en.htm

[17] www.digital-heritage.at

boundaries of cultural heritage, ICT and e-Infrastructures sectors should establish a **shared understanding** and appreciation of the priorities, capabilities and constraints of each group so that the actions proposed and enacted are effective. For example, the e-Collaborative Digital Archives pilot carried out during INDICATE managed the level of access control and rights management required in the e-CSG DCH archive applications by harnessing standard ICT authentication and authorization approaches. In addition, the requirements of the DCH community are likely to be different than traditional e-Infrastructures users. For example, users from the physical sciences, such as physics and biology, primarily exploit the processing power of e-Infrastructures without a significant need for long-term storage of data. In contrast, many DCH applications will require long-term preservation of large repositories of cultural data. These unique requirements will pose challenges for e-Infrastructure providers, but will also create opportunities to develop new services and products.

The Humanities are an important target for e-Infrastructures technologies and services. Dialogue and collaborative efforts between these domains must further be supported by effective communication and collaboration between the relevant ministries and agencies, so that policy and funding initiatives can be aligned with the identified needs of each sector and for the greater public benefit. At present, there are opportunities to improve strategies and policies to ensure a cohesive approach for the use of e-Infrastructures by the DCH community. We will **communicate** further with stakeholders from cultural heritage, ICT and e-Infrastructures sectors to establish standards and policies on a global scale that address issues related to long-term preservation. The identification of **common priorities** for shared R&D and validation will inform joint action plans for research and validation. This is **strategically essential** to address current challenges in areas such as preservation, geo-enabled services, end-user interaction, annotation and content creation, and semantic enrichment. By actively engaging in the development of the national and international **policy contexts,** which facilitate the collaboration of these stakeholders, we will ensure that humanities stakeholders are involved in setting out the roadmaps for the development of new technologies and technological standards that better suit the needs of DCH.

At present, cohesive strategies and policies are generally lacking for the application of e-Infrastructures to DCH, notably in the area of long-term preservation, as revealed during the INDICATE Long-Term Digital Preservation case study. However, some individual institutions were found to have detailed strategies that could be leveraged by others in the network through best practices communications to ensure that key issues, such as training, interoperability and financial viability, are consistently addressed. The FP7-funded coordinating action Digital Cultural Heritage Roadmap for Preservation (DCH-RP)[18] is an example of such a strategy.

Joint action plans and joint research plans across national boundaries within Europe and globally will ensure that research efforts are not duplicated and that financial resources are used efficiently. There is no added value to funding being used to research the same topics in different countries. Overlapping research can be avoided by agreeing common joint action plans and research plans. For example, the Joint Programming Initiative on Cultural Heritage[19] is a concerted research effort which aims to protect, strengthen and adapt Europe's cultural heritage in the face of continuous decay, that has recognized the need to align national and European research programmes in order to efficiently use financial resources, avoid overlapping research and maximize potential synergies.

[18] http://www.promoter.it/dch-rp
[19] http://www.jpi-culturalheritage.eu/

9.6 Represent and Train End Users

DCH initiatives should serve those who will ultimately access and use the cultural content. Therefore, **end users**, including the public, researchers, students and others, should be represented in the planning and delivery of new services and initiatives in order to ensure that their needs are fulfilled. Such representation can be achieved in a number of ways, including surveys, feedback from pilot initiatives and public consultations. Best practice for the recruitment, selection and debriefing of pilot user groups also needs to be identified and disseminated. For example, it is important that pilot user groups adequately represent the many different backgrounds and technical expertise of end users, from professional DCH researchers to students to amateur "citizen scientists". While they are not strictly end users, it is important to also solicit input from agencies and funding bodies, as well as from other initiatives in the area, to ensure that new services and initiatives effectively align with both existing initiatives and future policy landscapes.

Training of end users is also essential to raise awareness of the applications for e-Infrastructures in the digital humanities and to effectively achieve the full potential of e-Infrastructures and digital humanities collaboration. The development of e-Infrastructures that are accessible by non-IT experts will mean that a wider audience can engage with DCH collections. Barriers to engagement of users with DCH, such as geographical location, language, or lack of expertise, can be minimized and eliminated through the use of innovative e-Infrastructures and virtual exhibitions. It will also mean that training needs to be made simple and accessible to non-IT experts. Context sensitive help systems embedded in applications and goal-oriented training are essential mechanisms for ensuring that training meets the needs of users. Given the virtual nature of user engagement with DCH material, online discussion forums and training environments where users can train one another and share solutions to common problems would be suitable training approaches. Interoperability also has key benefits for training as there is a greater chance that training materials and discussion forums from one country will be applicable in another, thereby eliminating duplication of effort.

9.7 Pilots, Case Studies and Joint Implementations

Much of the strategic work carried out during INDICATE was based on pilots and case studies, supporting the evolution of **theory to practice**. These approaches proved to be effective means of identifying best practices and establishing areas of opportunity for future joint implementations. In particular, the analysis of data collected through case studies by workshops involving the network of common interest stimulated effective communication and collaborative dialogue. Pilots were found to be especially effective for verifying the feasibility and acceptability of best practices, encouraging cross-sectoral interactions between the DCH and e-Infrastructures communities, as well as validating the predicted usefulness of e-Infrastructures for DCH applications.

Europeana itself can be considered a large-scale shared pilot, with actors from across the European stage. Many important lessons have been learned that would be useful for DCH communities planning to develop a similar portal. For example, the process of aggregating content from a wide range of content providers has highlighted the need for interoperability and the challenges faced when ingesting content from different systems. Recently, Europeana has also addressed issues relating to ownership and copyright of content provided to the portal in its Data Exchange Agreement. Under this agreement, metadata contributed to Europeana will be published under CCO licence, so that the content provider is essentially

waiving all rights to the metadata worldwide so that any user can copy, modify, distribute them, even for commercial purposes, all without asking permission. This level of copyright may reduce the quantity and quality of metadata submitted to Europeana as content providers may choose to protect ownership of their own metadata, and may inform decisions about copyright agreements for other aggregating portals globally.

Pilots, case studies and joint implementations have also been carried out in other countries worldwide. For example, in the United States, the Library of Congress launched a five-year pilot project in 1995 to digitize archive materials, which was the beginning of the National Digital Library Program (NDLP).[20] The NDLP supports research into American history and culture through digitised records of primary source materials. Common challenges encountered by the NDLP, such as interoperability, intellectual property rights and ensuring effective access, are also faced by similar European initiatives, such as Europeana. Sharing the lessons learned from pilots, case studies and joint implementations from around the globe will allow a more efficient and synergistic advancement in the application of e-Infrastructures to DCH. It will also allow countries new to the area of DCH, such as Egypt and Jordan, to replicate the successes and avoid the failures of more experienced countries, such as Italy and France.

[20] http://memory.loc.gov/ammem/dli2/html/lcndlp.html

10 Future Plans And Perspectives

The INDICATE consortium are committed to maintaining and growing the network of common interest. As the network grows, it is envisioned that countries with significant experience of applying e-Infrastructures to DCH will share their knowledge and expertise with those novice countries that are only beginning work in the area. This knowledge transfer will lead to more efficient use of resources as novice countries will be able to adopt the best practices identified by previous initiatives, such as INDICATE and DC-NET. At the same time, these leading countries will work together to further common priorities for advancing work in the e-Infrastructures and DCH domains, such as developing advanced new services, improving annotation approaches and advancing the state of the art in visualisations.

10.1 Pilots and Case Studies

INDICATE has shown that pilots and case studies are effective ways to validate policy and best practices. For example, an initial common priority in DCH was long-term digital preservation. The INDICATE long-term digital preservation case study examined cases from across the Mediterranean region and successfully identified challenges in the area, as well as existing best practices, including ensuring long-term access to digital data and exploiting the potential of e-Infrastructures. In the future, the INDICATE network is committed to identifying **common priorities** for shared research and validation through further pilots and case studies carried out under joint action plans. Identification of these priorities will involve key stakeholders from the cultural heritage, ICT and e-Infrastructures sectors. Some example focus points include preservation, geo-enabled services, end-user interaction, annotation and content creation, and semantic enrichment. The research and validation findings will be used to inform the establishment of new and evolution of existing best practices, as well as to support the establishment of global strategies and policies.

10.2 Promote and Support Interoperability

Maximizing the impact of digital cultural heritage initiatives depends on **interoperability**, especially in the context of international collaboration and cooperation. Interoperability is essential in a number of areas, including technology, legal and access domains.

The importance of **technological interoperability** was highlighted in a number of the pilots and use cases undertaken during INDICATE. For example, the e-Collaborative Digital Archives pilot found that adhering to state of the art authentication and authorization standards was essential for protecting digital content. The Geo-coded Digital Cultural Content case study highlighted the importance of adopting standards from the digital geographic information field. Geo-coding digital cultural content that uses best practice from the Technical Committee 211 of the International Organization for Standardization, Open Geospatial Consortium, Infrastructure for Spatial Information in the European Community (INSPIRE) Directive and European Terrestrial Reference System 1989 (ETRS89) can ensure that accurate, consistent and usable geographic information is defined and developed. The INDICATE network will work to develop standards and other mechanisms to support global interoperability that specifically benefits digital cultural repositories.

Legal interoperability will also be a key issue in DCH as the re-use of digital material by different industries for commercial gain increases. Europeana has recently adopted a standard "public domain" model, where all material available through Europeana can be re-purposed and re-used without restriction. When contributing to Europeana, content providers must agree to this model and waive all rights to the meta-data they provide. While this offers the greatest flexibility to DCH users with interest in re-using digital cultural data, many cultural institutions are reluctant to surrender all rights to their meta-data. As a result, content providers may choose to provide minimal, limited meta-data to Europeana, which would reduce the potential for more powerful applications of e-Infrastructures for DCH, such as semantic search. For this reason, other access and re-use frameworks where the owners of digital cultural content could retain the rights their material and require payment for re-use if desired merit further exploration. Individual management of rights may not be practical, especially in the case of large digital repositories, as cultural institutions are unlikely to have the resources and expertise to monitor re-use of their content or negotiate licenses and remuneration for re-use. Suitable solutions to these problems may be found by examining the feasibility of establishing collective rights organizations for digital cultural material. Collective right organizations with successful payment models and access technologies have been used by the music industry for many years. Similarly, photography and imagery banks, such as Getty Images[21] and Corbis Images,[22] have proven, effective solutions for providing digital material for re-use that could inform best practices for re-use of DCH materials. Also, collective rights organisations have recognised both the potential of distributing of digital material online and related challenges, such as the conditions of protection and enforcement of rights. In response, these organisations have developed digital information systems, which are used to licence and monitor use of digital content. Cultural organisations reluctant to surrender all rights without payment could use similar frameworks to allow access to valuable digital cultural content and rich metadata for a fee or to waive rights and allow free re-use. The consequences of applying these different models should be examined and used to inform future best practices for digital cultural repositories.

Another key aspect of interoperability is the different national contexts and how they will impact on international best practice. Shared research agendas and action plans must account for differences in these contexts.

Interoperability is key for the re-use of digital cultural content, which has been promoted as one of the potential benefits of digitisation. However, such re-use has been limited to this point and the practicalities of re-using digital cultural data remain largely unexplored. INDICATE has shown that the use of pilots is especially effective in assessing novel applications of e-Infrastructure in the DCH domain. Pilots based on joint activity plans would be especially useful in the area of interoperability, both technological and legal. Such pilots should include members of the DCH, e-Infrastructures and ICT communities, as well as the creative and tourism industries, and "citizen scientists".

10.3 Promote Greater Use of e-Infrastructures by DCH

In October 2010, the High Level Expert Group on Scientific Data published the *Riding the Wave*[23] report detailing the **potential of e-Infrastructures to revolutionize how humankind generates, interacts with and**

[21] http://www.gettyimages.ie/
[22] www.corbisimages.com/
[23] http://cordis.europa.eu/fp7/ict/e-infrastructure/docs/hlg-sdi-report.pdf

exploits scientific data. Many of the benefits highlighted by the report can be achieved by the DCH community:

- researchers from different fields and in different locations can collaborate on common data sets to generate new knowledge;
- data can be used, re-used and combined to increase productivity;
- new knowledge can be generated by applying computationally powerful processes made possible through the use e-Infrastructures to large datasets;
- members of the public can access and contribute to the wealth of available data.

Awareness of these benefits should be used to drive greater use of e-Infrastructures by DCH. The report also identified key challenges which must be addressed to fully realize the potential of e-Infrastructures, including preservation of data, interoperability, data integrity, ownership, privacy, ensuring data providers can trust the system and the significant cost of providing and maintaining the infrastructures. These challenges must be addressed by the European and international communities in order to support further uptake of e-Infrastructures by DCH.

Digital humanities has an important user base who will benefit from the adaptation of e-Infrastructures, including the application of the e-Culture Science Gateways, repositories, easy to use graphical interfaces, social networks and other facilities. This will underpin the exploitation of cultural heritage material as outlined in the *Riding the Wave*[23] report. Target audiences for the promotion of DCH and its applications are varied and include museums, libraries and other cultural institutions, cultural agencies and ministries, ICT/e-infrastructures/DCH researchers, educators, industries that may re-use digital cultural content and "citizen scientists". In order to ensure maximum uptake of and support for e-Infrastructures by DCH, promotion should focus not on what is technically feasible but on the benefits of e-Infrastructures, such as reliable environments that are able to **provide new services and reach new users at lower cost than alternative approaches**. DCH is also inclusive as geographical, language and mobility constraints are removed and access to cultural material is improved. Many of these benefits can be easily accrued using existing technology and support systems, a reality which should be capitalized upon by the DCH community.

One of the goals of DCH is to **enhance user interaction with cultural content**. Indeed, public contribution and enrichment of data stores are a key element of the vision presented in the *Riding the Wave*[Errore. Il segnalibro non è definito.] report. In order for this type of interaction to occur, both technical and non-technical users must be able to easily access DCH material. The e-Collaborative Digital Archives Research pilot study undertaken during INDICATE highlighted the benefits of facilitating easy access to and use of e-Infrastructures for non-expert users. Simplified user access was achieved by creating portlets with accessible front-ends for discovering, finding and retrieving across multiple numerous digital archives. Similar pilots are needed to develop and test systems to facilitate user interaction with digital cultural data and allow contributions from a wide range of users, from DCH researchers to "citizen scientists". For example, applications for allowing user-generated content and user-annotated content to be added to digital cultural repositories could be used to promote user interactions.

There are a number of initiatives related to INDICATE, many with common partners, which are a source of useful information and expertise:

- **DC-NET** (www.dc-net.org) - ERA-NET scheme supporting cooperation in the field of e-Infrastructures as applied to DCH;
- **EGI-inSPIRE** (European Grid Infrastructure-Integrated Sustainable Pan-European Infrastructure for Researchers in Europe, www.egi.eu/projects/egi-inspire) - a collaborative project involving more than 40 countries that seeks to establish a sustainable European Grid Infrastructure;
- **EUMEDGrid-Support** (www.eumedgrid.eu) - an FP7 funded Infrastructure project that is working to facilitate the adoption of sustainable service provision models and to expand the pilot Grid Infrastructure developed during the EUMEDGRID project, generating a larger, production quality e-Infrastructure;
- **EPIKH** (Exchange Program to Advance e-Infrastructure Know-How, www.epikh.eu) - an FP7 funded project to support the effective usage of e-Infrastructures through knowledge transfer, dissemination and training;
- **CHAIN** (Coordination and Harmonisation of Advanced e-Infrastructures, www.chain-project.eu) - an FP7 funded project to ensure coordination and interoperation of EGIs and external e-Infrastructures;
- **Linked Heritage** (www.linkedheritage.eu) – an FP7 funded project which aims to contribute large quantities of new content to Europeana;
- **STACHEM** – (htttp://starc.cyi.ac.cy/stachem/stachem) – an FP7 funded Capacities project to support the development of a regional strategic plan for the Eastern Mediterranean region to develop and support research infrastructures for the archaeological sciences and digital heritage.

Engagement and collaboration with these related initiatives is essential to maximize their collective impact in the area of DCH. Similarly, it is essential that networks of common interest are maintained and expanded after projects are completed, wherever possible, so that the channels for collaboration and dialogue remain open as DCH continues to evolve.

The use of e-Infrastructures by DCH can also be **promoted through policy**. DCH stakeholders should engage with e-Infrastructures policy makers so that the requirements and priorities of DCH are represented in policy, future plans and roadmaps. This is crucial as the needs of DCH are different than traditional users of e-Infrastructures, such as the physical sciences. For example, DCH applications will require durable, long-term data storage not typically required by the physical sciences. Also, as it includes the general public alongside cultural institutions and researchers, the user base for DCH will generally be much larger and more diverse than current user bases.

10.4 Long Term Preservation

The INDICATE network will continue to pursue research and validation activities in order to **secure** the long term preservation of the digital patrimony of Europe, while seeking to **enhance** social benefit through access, interaction and enrichment services. Greater re-use of digital cultural content and promotion of DCH to encourage wider usage of the available materials is key to achieving social benefit.

Relevant to this regard is the new DCH-RP Coordination Action devoted to the development and validation of a Roadmap for Digital Preservation of cultural heritage content. DCH-RP will capitalise the results of INDICATE.

10.5 Growing Networks and Global Relationships

Europe is not the only region in the world with a vibrant cultural heritage, nor is it the only region engaged in DCH activities. As in Europe, there are many countries actively leading progress in the DCH field, as well as many novice countries embarking upon DCH journeys. The INDICATE network is committed to growing networks and global relationships in the future to **establish global best practices and collaboratively advance the state of the art**. Through these networks and relationships, knowledge transfer between leading and novice nations on a global scale will enable those new to DCH to replicate the successes and avoid the pitfalls of previous DCH endeavours. The networks and relationships will be expanded by leveraging the existing relationships of the INDICATE partners. For example, a number of INDICATE partners are also involved in the EGI-inSPIRE project (Italy, Greece, Spain, France, Slovenia, Turkey) which has a number of partners from the Asia-Pacific region, such as Taiwan.

The networks and relationships that will be established will also allow collaboration between leading countries, especially through joint global pilots and global case studies. A number of collaborative projects between European nations and the rest of the world are already in existence. For example, the Library of Congress in the United States has collaborated with the French National Library, the Bibliothèque nationale de France, to create a bilingual digital library about *France in America* and with the National Library of the Netherlands, other leading Dutch libraries, museums and archives on *The Atlantic World: America and the Netherlands* project.[24]

10.6 Measuring Progress to Ensure International Success

Measuring progress within the DCH sector has come to the forefront in recent years. As best practice evolves and demonstration and validation are achieved through joint implementations and pilots, we need to measure progress in key areas by implementing measureable indicators that reflect the impact of the activities. These indicators are also important for justifying public and private funding of DCH initiatives, and for illustrating alignment of DCH initiatives with strategic policies. Where possible, indicators should be standardised to allow international benchmarking. However, individual cultural institutions should also be free to use additional indicators that may reflect unique aspects of their collections or activities. Most importantly, **key performance indicators should reflect the benefi**t of the joint activities, and may include metrics such as:

- Diversity of audiences attending exhibitions (age, language, country of origin, etc.);
- Economic benefits of DCH (increase in revenue, etc.);
- Growth of digital cultural heritage presence in e-Infrastructures (virtual exhibitions, etc.);
- Uptake of e-Infrastructures by digital cultural heritage end users;
- Capabilities of e-Infrastructures to support digital cultural heritage (DCH specific applications, services, etc.).

Selecting and designing methodology to measure key performance indicators which accurately reflect the status quo of DCH initiatives is challenging. A number of projects are currently investigating how to measure DCH performance,[25] and will provide information to inform best practices. Therefore, the INDICATE network will monitor on-going research in the area, specifically in the digital domain, to ensure that best practices reflect evolving international benchmarks, and work to promote measuring progress to ensure international success.

[24] http://international.loc.gov/intldl/find/digital_collaborations.html
[25] http://www.museumkompas.nl/; http://www.promise-noe.eu/unlocking-culture

CONCLUSIONS OF THE WORK OF WP6

The WP6 Strategies and Future Plans of the INDICATE project led successfully 2 main actions:

- an exploration of the current programmes, policies, priorities and plans in the digital cultural heritage domain (both e-culture and e-Infrastructures), presented in the D6.1.
- the identification of opportunities for policy harmonization in the Mediterranean region and beyond.

This deliverable D6.2 refers to the results achieved in the second action.

Experts from the cultural heritage sector and from the e-Infrastructures, from the European and the Mediterranean countries explored existing programmes, policies and plans, in their respective countries, with the aim to discover similarities and discontinuitis, both in positive and negative terms. Opportunities of harmonisation were discussed and identified.

The Paris Declaration will be an important tool for the future: it has already been signed by the project partners, and is now opened to all institutions in cultural, research and e-infrastructure fields, who want also to commit in developing further collaboration.

The Paris Declaration will remain accessible online on the project website even beyond the EC funding period. In this sense, its promotion and dissemination is planned continue towards the main European policy groups, such as the e-IRG, ESFRI and e-IPF.