

DC-NET: The Establishment of the Digital Cultural Heritage Network

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Abstract

Core concern of the DC-NET project is to develop and to strengthen the coordination of public research programmes in the sector of Digital Cultural Heritage across Europe and to raise awareness of the possibilities offered by e-Infrastructures to help carry out advanced research programmes. The Network of Common Interest established by DC-NET will provide the forum for coordination. DC-NET Network will agree a set of common priorities for digital cultural heritage research and will work with e-Infrastructures providers to identify how best to carry out this research using the National Research and Education Networks, GRID and other e-Infrastructures. A Joint Activities Plan for e-Infrastructure-enabled research in digital cultural heritage will be generated and initiated. This work will pave the way to a series of innovative initiatives and the creation of Virtual Research Communities active in the digital cultural heritage research, powered by access to e-Infrastructures.

Categories and Subject Descriptors (according to ACM CCS): I.3.3 [Computer Graphics]: Picture/Image Generation—Line and curve generation

1. The DC-NET project

The cultural sector demonstrates interest and capacity to engage with ICT in order to pursue the own missions, resulting in projects, platforms, services for the digitisation, preservation, online access, communication, manipulation, enhancement, contextualisation, semantic interconnection of cultural and scientific resources, and in the generation of innovative learning and educational products. Nevertheless, there are still constraints on the adoption of ICT by the cultural heritage community; The solutions adopted are often driven by available commercial offering rather than by cutting-edge ICT research. The use of the e-Infrastructures is modest .

DC-NET project [dc-10] seeks to step up the cooperation and coordination, across and within the participating countries, of research activities carried out by cultural Ministries and research organisations in the field of digital technologies applied to cultural heritage and information, enhanced by the informed cooperation with the national and international e-Infrastructures, together with the expertise and practical experience of the cultural institutions (in particular, but not limited to, the LAM and the audiovisual archives) in the implementation and running of digital cultural services and activities.

More in detail, the objectives of DC-NET are:

- The establishment of an ongoing forum for the dialogue between the community of the digital cultural heritage research and the e-Infrastructures;
- The generation of a common awareness of the reciprocal research focuses, identification of communalities, awareness of existing projects, exchange of good practices, harmonisation of national programmes;
- The involvement of all relevant stakeholders within each country, bringing together Cultural Ministries, Research organisations, e-Infrastructures, Cultural institutions in the framework of the National DC-NET Working Groups;
- The enlargement of the network to all the European countries willing to join, EU member states, associated countries or third countries;
- The agreement on a Joint Activities Plan based upon a common research agenda and the creation of a joint commitment among the participating countries to initiate the implementation of the Joint Activities Plan.

The project will coordinate the manner in which cultural actors can and should engage with national and European e-Infrastructures to design and implement innovative services, tools and data sets to support the research of multi-

disciplinary communities. DC-NET aims at addressing the needs of the ministries, cultural heritage professionals and researchers with a multidisciplinary, cross sector approach.

Main final objective of DC-NET is to reach an agreement on a comprehensive plan for the implementation of a new data and service e-Infrastructure for the Digital Cultural Heritage (Figure 1). The new DCH e-Infrastructure will design a wide range of end-to-end services and tools facilitating integration and increasing the research capacities in the DCH sector. This will build upon the experience that the main DC-NET partners Shared in the framework of MICHAEL [mic10], the Multilingual inventory of Cultural Heritage in Europe, a project aimed at giving integrated access to digital cultural collections based on a distributed architecture both at organisational and technical level. The new e-Infrastructure will be targeted towards multidisciplinary virtual research community on digital cultural heritage, which is demanding more and more empowered functions (access, storage, preservation, usability, manipulation etc.) to improve their scientific collaboration and deploy innovative services for the professional users. MICHAEL will provide to DC-NET a well established network of thousands of trans-European cultural institution and an organisational background, allowing to better focus the real needs for research in the field of digital cultural heritage in the short and medium term; Moreover, MICHAEL platform and data will offer a starting point and a test-bed for the innovative digital services to be jointly designed by the DC-NET partners.

The overall activities of DC-NET will support and contribute to the Joint programming initiative "Cultural Heritage and Global Change: a new challenge for Europe" launched by a Commission Recommendation [20110] and [COM10] in April 2010.

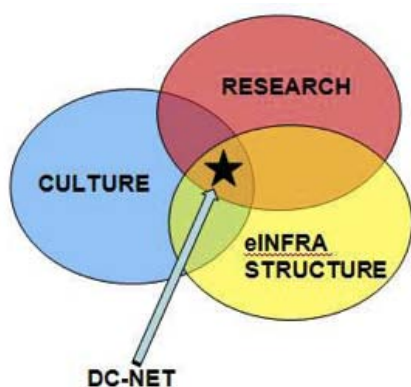


Figure 1: DC-NET fosters cooperation and coordination among three sectors (cultural ministries/institutions, research organisations, providers of e-Infrastructure) focusing on the research and implementation of digital cultural services.

DC-NET (Digital Cultural heritage NETWORK - ERA-NET supporting cooperation for research infrastructure in the digital cultural heritage field) is an ERA-NET Coordination and Support Action contributing to the European Research Area Network in the field of e-Infrastructures for the digital cultural heritage. ERA-NETs [ERA10b] [era10a] are networks which coordinate regional and national research activities in a given domain. They typically involve programme owners and managers, those bodies responsible for planning, managing and coordinating research programmes in their own nations: Ministries and government agencies are usual ERA stakeholders, however other research organisations are also often involved.

DC-NET is funded by the FP7 Infrastructure programme for the duration of 24 months, starting December 2009. The project website spreads information on the progress of the project, its network and working groups to the general public and the professional audience.

2. Partnership and enlargement

Eight ministries and agencies responsible for cultural policy and programmes participate to DC-NET already. They are the Ministries of Culture of Estonia, France, Greece, Hungary, Italy, Slovenia, Sweden and the Scientific and Technical Information Service of the Belgium Federal Science Policy Office.

The list of DC-NET partners at the project's starting point is the following:

- Italy (Coordinator), Ministero per beni e le attività culturali. Istituto Centrale per il Catalogo Unico delle biblioteche italiane, ICCU;
- Belgium, Politique scientifique fédérale/Federaal Wetenschapsbeleid - STIS (Scientific and Technical Information Service), STIS;
- Estonia, Eesti Vabariigi Kultuuriministerium, EVKM;
- France, Ministère de la Culture e la Communication - Mission de la Recherche, MCC;
- Greece, Hellenic Ministry of Culture, HMC;
- Hungary, Oktatási Kulturális Minisztérium, OKM;
- Slovenia, Ministrstvo za Kulturo, MKRS;
- Sweden, Kulturdepartementet - Riksarchivet, RA.

Organisations and programme owners from Member States and Associated Countries already expressed their interest to join the network, and will be able to formalize their participation by signing either a Membership Agreement or a Cooperation agreement.

The Network of Common Interest established by DC-NET is intended to be open to the participation of new countries in addition to the partners of DC-NET. The recruitment of other countries is foreseen since the earliest stage of the project. It will strengthen the network and enhance its impact. Experts and representatives of the countries joining the

network might be involved in project activities, as a result of the enlargement of the network.

3. The DC-NET Network of Common Interest

As an ERA-NET coordination action, the main activity of the DC-NET project is to bring relevant people together, to explore how e-Infrastructures can enhance the research in the cultural heritage sector and to pool programmes and resources to sustain the envisaged research and development. A Network of Common Interest is being established in order to enable the cooperation and coordination among the main actors involved (ministries and funding agencies, research organisations, e-Infrastructures, cultural institutions).

DC-NET aims at combining networking at international and at national level and will complement a bottom-up with a top-down approach. This will be achieved through a mechanism of national and international working groups, cooperating to fulfil the aims and tasks of DC-NET, and also contributing to the establishment of an ongoing forum for coordination of European research in the field of digital technologies applied to cultural heritage. The Network's activity won't be limited to the achievement of the project objectives and will remain active well beyond the end of the DC-NET project.

The aim of DC-NET project is to increase cooperation and coordination between three stakeholder groups, cultural institutions, ICT and Digital Cultural Heritage research organisations and e-Infrastructure providers (GRID, NREN, etc.) in order to establish good quality communication, knowledge and practice exchange, and to enable the use of e-Infrastructures in enhanced cultural heritage services. The DC-NET working groups are the key mechanism for delivering this cooperation and coordination; Each working group consists of members of the three stakeholder communities, working together.

National working groups are typically large groups of experts from a variety of disciplines, working to provide a national perspective to DC-NET related issues; These groups are long-term, and frequently build upon existing partnerships and collaborations. International working groups are "virtual" groups of experts, most of whom active in their respective national working groups, who work together to address a specific issue relevant in the framework of DC-NET project (Figure 2).

The Network of Common Interest will improve the coherence and coordination of DCH research programmes across Europe with the development of a Joint Research Agenda, resulting in the effective coordination of research agendas, policies and programmes. The ongoing coordination and the Joint Research Agenda will enable national systems to perform activities in cooperation, which they would not have been able to tackle individually. Moreover, the DC-NET Network will initiate a Virtual Research Community which

will carry on coordinated research and will work towards a data and service infrastructure for digital cultural heritage research. DC-NET service infrastructure will be an evolution of the MICHAEL approach, community and service.

The achievement of all the mentioned results requires a progressive approach, a remarkable engagement of the three communities, a substantial involvement of all relevant stakeholders, included, in the latest stage, the technology providers. The key asset to reach the objectives is the establishment and the smooth running of national and international cross-domain working groups, building the first core of the Forum for coordination of European research and of the Virtual Research Community in the field of technologies applied to cultural heritage.

The mutual interaction and feedback of the national and international levels will foster the engagement and the active contribution of the relevant stakeholders, and the achievement of an optimal coordination across the three main fields DC-NET is concerned with, while at the same time covering the widest range of inputs, issues, requirements, competences, demands, knowledge and proposals.

The good working group mechanism will establish the Network of Common Interest as an open structure, resulting in the improvement of the coherence and coordination of research programmes across Europe through the development of the Joint Research Agenda and the deployment of a Joint Activities Plan. The Network will begin to implement the Joint Activities Plan already during the project lifetime; However the Joint Activities Plan will be looking well beyond the project's end, as it will represent the starting point of a the new phase of integrated research, shared policies and high quality implementations.

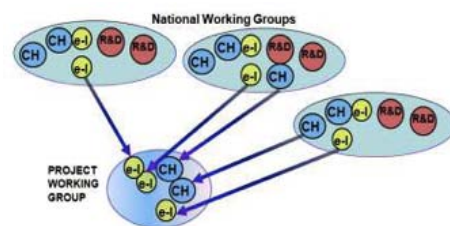


Figure 2: DC-NET National working groups provide experts to the Project working groups.

3.1. The DC-NET National Working Groups

The DC-NET National Working Groups are the mesh of the Network, its engine and the forum where each task foreseen by the project takes shape. They provide the bottom-up approach to the ongoing forum for coordination by bringing the relevant experts together, establishing the community of common interest, fostering the long term commitment of all relevant stakeholders, supporting the projects activities and

contributing to the production of the Joint Activities Plan endorsed by the relevant ministries of each Member State.

Their main focus will be the digital cultural heritage, intended mainly as ICT applied to cultural heritage research and digital services for the access, creation, communication of cultural resources. Issues such as the long term preservation of digital objects, institutional repositories, intellectual property rights, the needs for the training of new professionals will be also taken into account. According to the project aims, the National Working Groups activity will have four main focuses:

- The integration and enhancement of the research;
- The refocusing of the research priorities;
- The co-ordination of national and European programmes;
- The development of a plan of joint activities and the commitment of the partners to carry it out.

DC-NET National Working Groups are a new breeding ground fully interdisciplinary cross-domain community, and will be the core of the Virtual Research Community on Digital Cultural Heritage initiated by DC-NET.

The following types of organisations are represented in DC-NET National Working Groups:

- Ministry or other national Agency responsible for the cultural policy and cultural affairs (or institution mandated by them);
- Local authorities dealing with cultural policies;
- Main cultural institutions engaged with digital services;
- Research organisations (University Departments; Research Centres);
- NREN, GRID and other infrastructures, of interest for the cultural sector for their provision of technologies and computing services;
- Other outstanding cultural, scientific or technology organisations.

A set of Terms of Reference defines the procedures to run the actual work in the network and provides guidance to the working groups with the aim to enable a consistent approach to the WG activity across the different countries, while preserving the diversity of each national organisation.

The National Referee, appointed by each participating country, is the junction between the national and the international levels of the network. National Referees establish the national working groups, coordinate and report about their activity and make sure that the national working group provides the contributions and feedbacks needed by the project at international level (Figure 3).

4. The DC-NET project activities

Besides the actual establishment of the network, coordinated by MiBAC/ICCU, DC-NET will develop over its two years duration the following activities:

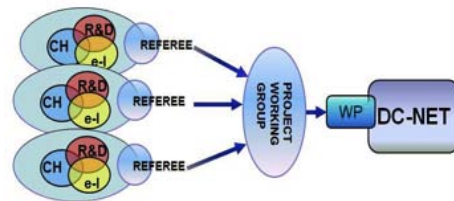


Figure 3: DC-NET National working groups provide input to the Project WPs through the National Referees.

- e-Infrastructure Awareness, coordinated by STIS, Belgium and EVKM, Estonia. Deep knowledge about national and international e-Infrastructures is lacking among the cultural heritage community, and raising awareness about them is among the main objectives of DC-NET. The project explores the e-Infrastructures available in each Member State and internationally, their technical features and mechanisms, policies, programmes and regulations governing their access. The expectation is that the mutual understanding between the digital cultural heritage and the e-Infrastructure community will lead to develop shared aims and objectives and thus outline ambitious projects basing on the potential that can reasonably be deployed. The main result of this activity will be the *e-Infrastructures Handbook*, gathering all relevant information about e-Infrastructure facilities, services, mechanisms and contacts in each participating country. The Handbook intends to provide a solid basis for the ongoing dialogue between digital cultural research and e-Infrastructures. An *International Concertation Seminar* will allow representatives of the cultural heritage, research actors and e-Infrastructure participating to the Working Groups to actively contribute to the establishment of common policies, programmes and rules to be applied to the interaction between digital cultural heritage and e-Infrastructures across Europe.
- New Service Priorities, led by MCC, France and RA Sweden. Through the combination of the priorities of the digital cultural heritage research with their new knowledge about e-Infrastructure capacities, new services will be identified and planned. The priorities of the Cultural Ministries and Agencies will be reviewed basing on the potential offered by the e-Infrastructures for the new services which they aim at delivering. The ambitions presented by the Ministries will be first discussed on the occasion of a Workshop targeted to the new services; they will then be further analysed and investigated, and a set common e-Infrastructure-enabled ambitions will be drafted. This process will rely also on the collection of information on best practices, offering concrete examples of good interaction between the DCH community and the e-Infrastructures one.

- Technical Validation, led by HMC, Greece and MKRS, Slovenia. It will be investigated in detail how e-Infrastructures will support the achievement of the new service priorities, by matching each ambition to available resources, services and e-Infrastructures in each Member State. The technical feasibility of each envisaged service will be validated; Other factors, such as the perceived value to the cultural heritage sector, the impact on e-Infrastructures and other users, the potential for international replication and collaboration will be taken into account.
- Dissemination, led by STIS, Belgium and OKM, Hungary. Since DC-NET project aims to increase the mutual knowledge of the digital cultural heritage community and the e-Infrastructures community and to enlarge the network to a fully European dimension, dissemination of the project aims, activities and findings is not an additional project task, but rather a dimension of the project itself. Dissemination activities will bring the new knowledge generated by DC-NET to a wider professional audience engaged with cultural heritage and new technologies in the participating, joining and third countries. Three main international public events are planned:
 - A mid term international conference which will take place under the Belgian Presidency of the EU (scheduled for October 29th 2010);
 - A second mid term international conference taking place under the Hungarian presidency of the EU, planned for the month of June 2011;
 - A final international conference announcing the ultimate achievements of the project, and launching its follow up, which will take place at the end of 2011 and has still to be planned in detail. The final project event will establish Europe-wide awareness at the appropriate government level of the potential which is unlocked by combining digital cultural heritage research and e-Infrastructures.

It could be emphasized that the working group members will have a crucial role individually, in disseminating the project results in any context they are active. Working groups experts will be able to liaise with the national and international projects they take part to, in order to foster the endorsement by a wide pool of stakeholders belonging to each segment of the three wider communities that are being brought together by DC-NET. To mention just an example, members of the Italian DC-NET Working Group are involved in international projects such as: ATHENA, CHAIN, D4Science, DL.org, DRIVER, EFG, EUMedGrid, EUAsiaGrid, EuropeanaConnect, Europeana V.1.0, HOPE, OpenAIRE, TELplus, TrebleClef; were involved in projects as MINERVA, MICHAEL, Caspar, Diligent, Delos, Bricks, Digital Preservation Europe, Imagination, Multimatch; run Regional programmes, National Research programmes and main initiatives such as CulturalItalia. The working group members are also in-

volved in the design and implementation of innovative and experimental digital library systems, among which DIRECT. Dissemination activities will involve a training programme, supported by training materials such as handbooks, best practice guides and other outputs from the project Work Packages. The aim of the training activities and materials is to equip cultural heritage bodies with the competences needed to engage with their national or regional e-Infrastructure providers for the delivery of innovative services, taking advantage of the new opportunities which e-Infrastructures bring to cultural heritage. National working group members will contribute to drawing up the training materials and will play an important role in the delivery of training events in the own country. The target audiences for these events will be mainly organisations (LAM, audiovisual archives, heritage preservation offices etc.), researchers, cultural ministries and agencies and other actors who could be responsible for digital cultural heritage initiatives. Representatives of the digital cultural heritage community from countries beyond the consortium might be invited to the training events.

- Joint Activities Plan, led by ICCU, Italy and MCC, France. Having agreed a common set of new services priorities and the validated these, the Consortium will then work on the Plan of Joint Activities for digital cultural heritage research using e-Infrastructures. The core of the Joint Activities Plan will be based on three main components:
 - The development of a range of guidelines and recommendations for the exploitation of the e-Infrastructures in the digital cultural heritage, based on the successful approach of MINERVA
 - The deployment of a data and services infrastructure. This e-infrastructure is an evolution of MICHAEL
 - The creation of a Multidisciplinary Virtual Research Community

The implementation of the activities planned will start already during the lifetime of the project.

5. Conclusions

The DC-NET project identifies and addresses the need to bring together the communities of Cultural Heritage, IT research and e-infrastructures, in order to achieve a coordination and enable the development of infrastructure-based services at the European level in response to the priorities of cultural heritage stakeholders. A further vehicle for the growth of DC-NET is the Joint programming initiative Cultural Heritage and Global Change, through which the European Commission encourages Member States to take concerted actions addressing coordination of cultural heritage research.

DC-NET will contribute to the coordination of the research priorities of Ministries of Culture, Agencies and other

cultural bodies across Europe in the area of digital cultural heritage research powered by the e-Infrastructures. The project will also stimulate an increased engagement and use of national and European e-infrastructures by the Cultural Heritage Community.

Its significant impact will result in a lasting co-ordination in the field of Digital Cultural Heritage research of relevant national ministries, funding agencies, the R&D community and e-infrastructure bodies at the European level.

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