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SCIENCE POLICY BRIEFING ON RESEARCH INFRASTRUCTURES IN THE DIGITAL HUMANITIES: LANDSCAPES, ECOSYSTEM AND CULTURES

ABSTRACT: On September 2011 the European Science Foundation (ESF) published a so called Science Policy Briefing (SPB) on *Research Infrastructures in the Digital Humanities*,¹ the first ESF publication of this type entirely commissioned by the scientific governance representing the Humanities – a unique body in Europe: the Standing Committee for the Humanities (SCH), chaired by Professor Milena Žic Fuchs. The report aims both at serving a research community that is expanding and eager to see its efforts of engaging with computational modelling recognised as authoritative research in need of adequate research infrastructures, and the policy makers arena, where strategies on research infrastructures for the humanities are rarely shared at the international or national level. The research community and information professionals – involved in various fashions in the development of this ESF publication as workshop participants, authors,² reviewers,³ commentators – can make and are making use of this

¹ The report is available in PDF at <http://www.esf.org/publications.html>. Recommendations are collected at the end of the report but also appeared in a separate leaflet, the executive summary, also available at the same link. The ESF is an umbrella organisation representing national research performing and funding organisations from 30 European countries. Since its funding in 1974, it has been active in directing research policy in Europe by, amongst other actions, publishing many such policy reports. Note that the ESF is undergoing a major restructuring phase; for more information, see: <http://www.esf.org/esf-today/recent-developments.html>

² The expert group of authors was chaired by Professor Claudine Moulin and besides the authors of this paper includes: Professors Margaret Kelleher, Elmar Mittler, Marko Tadić, Maria Ågren, Andrea Bozzi, and Kristin Kuutma.

³ The report was peer-reviewed by international experts.

report to legitimise their research questions and funding requests, while policy makers – from research funders to University deans – will also find strategic directions to be taken on or be inspired by.

KEYWORDS: Digital Humanities; Europe; Research Infrastructures; Research Policy

RESEARCH INFRASTRUCTURES ORIENTEERING

1. *The Humanities back in the picture*

The topic of research infrastructures – their management structures, funding, sustainability, evaluation – has received lots of attention at the international level in recent years with major budgets being released to build anew or to refurbish existing facilities for research in Europe and beyond. However, such debates and associated investments have traditionally excluded or have only marginally touched the Humanities.

The introductory section of the ESF SCH report on *Research Infrastructures in the Digital Humanities* reminds its readers that research infrastructures as major efforts to organise knowledge have a long history at the heart of humanistic endeavours. Nevertheless, the SCH intention with the publication of this report was to bring the Humanities back into the picture by focusing on the present and by advising on how best to shape the future. Indeed, as the authors state in the report, to bridge physical and digital research infrastructures by providing “greater access to a culturally broader and more varied set of empirical data” (p. 9) is a question of survival for the Humanities and an unprecedented opportunity to contribute to the grand challenges of our time. In particular, the focus of this publication is on the relatively recent developments in the Digital Humanities⁴ and on what these mean for

⁴ Quoting the definition as given in the report (p. 9, note 19): “The field now known as *Digital Humanities* aims to use information technology to illuminate the human record, and [bring] an understanding of the human record to bear on the development and use of information technology”. Traditionally, it traces its most immediate origins back to 1949, when Father Roberto Busa started the electronic processing of the complete work of St Thomas Aquinas in order to produce an exhaustive index of the lemmatised words. See also: S. Schreibman-R. Siemens-J. Unsworth, *The Digital Humanities and Humanities Computing: An Introduction*, in Schreibman et alii (eds), *A Companion to Digital Humanities*, Oxford, Blackwell, 2004, p. xviii ff.

research and research policy in the Human sciences as a whole. By synthesising the research literature and drawing on a series of specially commissioned case studies, the report attempts to provide a theoretical and pragmatic context for recent developments in the digital humanities, while at the same time sketching a framework where relevant research infrastructures can be understood, defined and improved.

2. *A hybrid landscape*

Data and access are the keywords around which the report defines research infrastructures in the digital humanities. Infrastructures traditionally associated with research in the Humanities – such as libraries, archives and museums – as well as newly established settings – such as virtual competence centres – find their place on the map. The map is argued to be dynamic and its parts interdependent: libraries are recognised as major players in the digital world, for instance, while web services are seen as building on local knowledge and expertise.

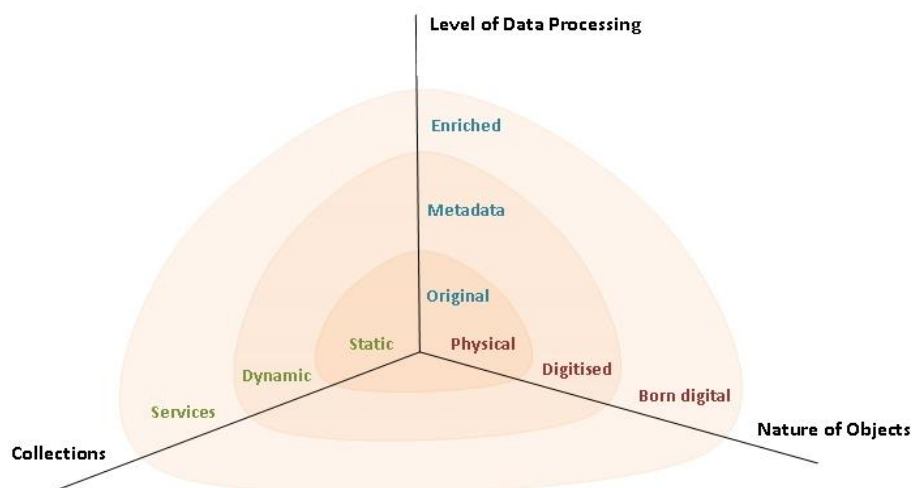


Figure 1 – This corresponds to figure 2 in the report, the caption of which quotes: “A set of concurrent criteria for defining the RI [Research Infrastructure] in Humanities. The same representation applies for the local/institutional level, the national/community level, and the pan-European/global level.”

What results from this framework and the case studies featured in the report is an evolving, variegated landscape, where infrastructures for the Humanities are not confined to research archives and libraries only, and where research archives and libraries have converged with digital media. This landscape is made heterogeneous not only by those infrastructures traditionally associated with Humanities research that have embraced remediation strategies, but also by other kinds of resources such as databases, for instance. While the use of databases is spread across all scientific disciplines, the organisation of structured metadata and analytical data, usually in the form of a relational model, has seen an increasing uptake across the Humanities.⁵

Some Human sciences rely heavily on specific digital resources or digitally produced datasets for their research. One example: language resources spanning from modern and historical dictionaries to linguistic corpora and annotated texts, from multimodal datasets (including speech, prosody, gestures, signs, eye and body movements recordings) to encoding schemes and language archives are of paramount value for linguistic research. Furthermore, in the Humanities, some conceptual models are expressed as explicit formalisations that map a concept to its intended semantics. These have developed into research infrastructures indispensable for modelling certain knowledge domains, for example, thesauri and taxonomies which have a long tradition in supporting analytical efforts especially in linguistics. Increasingly, digital models built around conceptual ontologies and networks are being developed for modelling specific research domains or for cross-referencing purposes.

The report makes clear that many disciplines in the Humanities benefit from the technologies – and the relevant human expertise – around which research infrastructures are designed, whether physical facilities, contextual resources or laboratories and equipment. For example, linguistics with language web services allow individual researchers and institutions to share linguistic digital resources, while

⁵ Such statements are substantiated with references to appropriate literature in the report.

visualisation facilities enable archaeologists to connect multiple resources and tools so as to produce archaeological simulations. Other research facilities have a somehow narrower application but are generally relevant for a domain of research rather than a single discipline. Cognitive science facilities, for example, are in place to support neurological/psychological research on the textual, visual and audio stimuli used in many Humanities disciplines such as linguistics, phonetics, musicology, art history. With the so called ‘spatial turn’ taking pace within the Humanities due to the increasing availability and exchange of digitally located data, webmapping and Geographical Information Systems (GIS) data facilities are becoming newly adopted research infrastructures in the Humanities.

A CHANGE OF CULTURE

The authors of the report recognise that technological changes are not *per se* innovative unless “intellectual and cultural resources are interacting and performing at the best of their potential” (p.41). The section of the report dealing with ‘Priorities for Policy and Research’ aims precisely at channelling such interaction by focussing on existing assets - active research communities and institutions – and by harnessing their potential to operate as research infrastructure “ecosystems”. To this end, the section of the report on ‘Communities of Practice’ highlights some of the existing initiatives of reference in the digital humanities realm, while the section on ‘Digital research in the Humanities: who is Responsible?’ identifies the main challenges – such as fragmented research and digital silos, partial standardisation, lack of academic incentives and recognition, sustainability and preservation issues (to which a separate section is dedicated in the report) – as well as possible models of cooperation across international, community-based and institutional local infrastructures.

The refinement and application of specific mechanisms, such as adequate systems for research evaluation that account for the

interdisciplinary nature of research in the digital humanities or the wide deployment of certified repositories for the deposit of research data, are recommended and coupled with a forward looking attitude towards research and society at large. Not by chance a whole section of the report is devoted to 'Education and Training'. Young researchers are identified as key players⁶ in fostering an open academic culture that creates bridges across forms of knowledge representation (physical and digital), diverse resources, disciplines (between Computer Science/Engineering and the Humanities but also within the Humanities itself), institutions (academic and infrastructural; private and public partners), audiences (scholars and citizens) and, last but not least, across linguistic borders.

The case studies and initiatives mentioned in the report form a rich panorama. However, more can be done to ensure that such developments are encouraged evenly across Europe, to interconnect resources and therefore expand interpretative frameworks, to promote interdisciplinary research starting from tailored higher education curricula, to implement suitable funding and evaluation models that spring from the kind of intellectual challenges that the digital humanities community has made its own.

So, if it is now becoming common to be able to read the Sunday newspaper on one's phone or tablet thanks to a public library's modest or even free subscription, will the scholars of tomorrow be able to share their models and simulations in a similar manner? Will they be able to rely on stable infrastructures to make their scholarship accessible? Will they get academic recognition for a 'publication' that interconnects their primary sources to layered maps, a colleague's monograph to her blog, their texts to other digital reference resources? How interdisciplinary will their research team be?

⁶ See also the recently published ESF manifesto on "Changing Publication Cultures in the Humanities", Young Researchers Forum, ESF Humanities Spring 2011, also available at: <<http://www.esf.org/publications>>.

It is striking to see sometimes how academic endeavours challenge our current infrastructures even when conceived to appeal to the public interest. Take, for instance, the “Antikythera Mechanism Research Project”⁷ whose international team includes expertise spanning from astronomy to palaeography, from mathematics to philology, from physics to archaeology, from history to filmmaking and from mechanical engineering to image processing, with the crucial involvement of a national museum, the collaboration of software companies and the support of public and private funding bodies. At present, in order to learn more about the Antikythera Mechanism it is possible to choose from diverse communication modes; however, all are inevitably constrained by their respective medium of dissemination. For example, the project website and clips can be browsed for free, but despite the remarkable effort of its authors, it does not go beyond an exhaustive overview of the project and its achievements. Subscription to academic journals, purchase of single articles and monographs are the traditionally academic channels through which a more in depth analysis can be given. A trip to the bookshop can complement the scientific analysis with more popular books and magazines. One could even decide to go to Athens to see an exhibition dedicated to the Antikythera Mechanism (open at the time of writing, but shut by January 2014); if in the UK a recently broadcasted BBC documentary⁸ can be downloaded using BBC iPlayer. While watching the captivating documentary though, one would only wish to be able to connect all the pieces together beyond the page or the screen, stop the video, click on the digital model of this at least 2000 years old planetarium, take it apart, build it again, compare it with its medieval counterparts, enlarge the Greek inscriptions, look the words up in an historical dictionary, browse the other 3D objects found in the Roman cargo that sank with it, and lots of other interesting things.

⁷See <<http://www.antikythera-mechanism.gr/>>.

⁸See <<http://www.bbc.co.uk/programmes/b01hkcq>>.

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Humanities researchers – whether recognising themselves as public intellectuals or not – if supported by appropriate infrastructures can engage in the design of digital models embedding interdisciplinary knowledge and faceted interpretative contexts, accessible from anywhere, open to be enriched with new insights.

REFERENCES

- The Antikythera Mechanism Research Project*: <http://www.antikythera-mechanism.gr/>.
Changing Publication Cultures in the Humanities, Young Researchers Forum, ESF Humanities Spring 2011, February 2012: <http://www.esf.org/publications>.
Moulin, Claudine, Nyhan, Julianne, Ciula, Arianna *et al.*, *Research Infrastructures in the Digital Humanities*, ESF 42 Science Policy Briefing, September 2011: <<http://www.esf.org/publications>>.
Moulin, Claudine, Nyhan, Julianne, Ciula, Arianna *et al.*, *Research Infrastructures in the Digital Humanities: Executive Summary*, ESF 42 Science Policy Briefing, September 2011: <<http://www.esf.org/publications>>.
The Two-Thousand-Year-Old computer, BBC 4, May 2012: <<http://www.bbc.co.uk/programmes/b01hlkcq>>.

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