

Mid-Term Theme Report

Title of Theme:	Adoption of e-Research Technologies
Theme Leaders:	Alexander Voss, Rob Procter, Tom Rodden
Start Date of Theme:	1 st September 2006
Report Date:	27 th April 2007
Elapsed Time:	8 of 12 months (although note extended timeline)
Target Audience:	All people involved in e-Research, be they application scientists, funders, e-infrastructure providers, tool developers etc. Some definitions: AHDS – Arts & Humanities Data Service AHeSSC – Art & Humanities e-Science Support Centre AHM – UK e-Science All Hands Meeting CSCW – Computer Supported Cooperative Work CWE – Collaborative Work Environment NCeSS – National Centre for e-Social Science UTF – UK e-Science Usability Task Force VRE – Virtual Research Environment (aka. Cyberenvironment, Collaboratory, Science Gateway, etc.)

Executive Summary:

The key outcomes of the theme so far are the funding of two projects in the community engagement strand of JISC's e-Research programme. The first one is a collaboration between NCeSS, NeSC and AHeSSC and will study and address barriers to uptake. The second, related project is led by Oxford with NCeSS as a partner and will develop use cases and service usage models. In addition, two projects in which NCeSS is involved were funded under the JISC VRE2 programme. NCeSS has also received funding from the British Academy and the National Science Council of Taiwan to collaborate with the Academia Sinica Grid Centre to study the uptake and sustainability of e-social science in Taiwan and the UK.

The first workshop run on 14th-16th March was a success in that it managed to bring together a group of 26 researchers from various constituencies as well as from 5 different countries who took part in a round table discussion on Realising and Coordinating e-Research Endeavours. The initial outcome of this workshop is a Blog containing a wealth of material on the subject which we will keep running (at www.e-ResearchCommunity.org) to collect further evidence from the community. A workshop report is in preparation as a submission to the 3rd International Conference on e-Social Science. Follow-up events are in preparation where we will advertise this community resource and invite colleagues throughout the world to contribute their experiences. This work will tie in with the JISC projects which will help to achieve sustainability beyond the running time of the theme itself.

Furthermore, we have worked with the UTF to start developing a dissemination and sustainability strategy for its work. Gary Olson's visit to the e-Science institute has been used to extend this work to a wider international context and to ensure links with the excellent work done at CREW in Michigan. Our first technology focus on workflow systems has led to very fruitful collaborations both with the myGrid team in Manchester and with Inforsense Ltd. / Imperial College. These links have already started to produce tangible outcomes such as the successful myExperiment VRE bid in which NCeSS is a partner and initial work on a "buyer's guide" on workflow technology. They will be further developed in the coming months, e.g., in the context of developing a Summer School for application scientists.

Finally, a paper on “Collaboration in and for e-Research” has been accepted for the German e-Science Conference as has a submission to a workshop at the 5th International Pervasive Computing Conference. A workshop on “Issues in Ontology Development and Use” has been accepted for the UK e-Science All Hands Meeting and we have submitted a paper on the two JISC Community Engagement projects as well as two Birds of a Feather sessions.

Objectives:

The aim of the theme is to study factors that may inhibit the wider diffusion and adoption of e-Research technologies and tools, and devise strategies for tackling them. As an e-Science Institute research theme it is slightly unusual in that rather than working on a specific technology or conducting research in a particular area, our aim is to study e-Research in its various forms, to identify broad themes that impact on e-Research and to work up ways in which e-Research can be understood and taken up by a wide range of people.

The study design will pay attention to a number of research dimensions:

- Field (e.g., physical sciences, systems biology, social sciences, arts and humanities)
- Sector (e.g., academic, public services, commercial)
- Country (e.g., UK, Europe, US, Asia, Australia)
- Technologies (e.g., middleware, grid and web services, workflow, visualisation, portals)

We will study the barriers and facilitators in relation to three groups identified as ‘early adopters’, ‘the interested’ and ‘the uncommitted’.

Chronology of Events:

1. [GridKA Summer School](#) (11.09.-15.09.2006) Alex attended the gLite installation, use and programming sessions. The opportunity was also used to have some early discussions with the NeSC training and outreach team as well as with the organisers of the summer school.
2. [UK e-Science All Hands Meeting](#) (18.-21.09.2006)
Of particular interest was the AHRC session which highlighted issues about user-designer relations, multidisciplinary and professional identities.
3. [Infrastructures and Architectures Workshop](#) (27.-28.09.2006)
This workshop was organized by Robin Williams (Research Centre for Social Sciences, University of Edinburgh), hosted at the e-Science Institute, and sponsored by eSI and the ESRC e-Society Programme. Its purpose was to close the gap between social science research into ICTs and recent technological developments around new information infrastructures and architectures (e.g., Grid, web services, Web 2.0).
4. [myExperiment Party](#) (28.-29.09.2006)
Together with Rob Procter, Alex has helped to facilitate a workshop organised by myGrid aimed at eliciting and prioritising requirements for the myExperiment portal, a collaborative research environment to support the experimental process by allowing in-silico experiments to be traded within research communities. This has led to a bid for the JISC Capital programme to build a myExperiment VRE. NCESS is a partner in this bid, which will create a social science version of the myExperiment VRE in the second part of the project.
5. [NCRI Cancer Conference](#) (09.10.2006)
Alex attended the Cancer Informatics strand of the conference. In the past, the NCRI Informatics Initiative has been working on data sharing policies and on mapping the field of cancer informatics through the planning matrix. Over the next 12 months, the NCRI Informatics Initiative will be reshaped to move from a consultation role to implementation of a Cancer Informatics Platform. Key elements will be a registry of components (from caBIG, CLEF, CancerGrid, etc.) and demonstrators for a platform reference model as well as an imaging and pathology functionality. The NCRI has now issued a [call for expressions of interest for a UK cancer informatics platform](#).
6. **GEMS/GEESE/OGC Grid Collision Meeting** (10.10.2006)
Alex attended this meeting (organised by Ann Borda and James Farnhill of JISC) to present the ESRC e-Infrastructure Programme and discuss overlaps between the various projects relating to geospatial data and Grid technologies.
7. [JISC Town Hall Meeting](#) (11.10.2006)
Alex attended the town hall meeting for the JISC Capital Programme, see also report on JISC bids in the research outputs section.

8. **Oxford Fieldtrip** (15.-20.10.2006)
Meetings with Sharon Lloyd, Matthew Mascord, David Gavaghan, Anne Trefethen, Annamaria Carusi, Ralph Schroeder, Mike Fraser, Ivan Flechais, Ruth Kirkham, Jenny Fry, Marina Jirotko, Grace de la Flor.
9. **eSI Public Lecture** (25.10.2006)
Alex gave the first public lecture as part of the eSI theme, outlining the issues we are aiming to address and the programme of work.
10. **Ontogenesis Network** Meeting (30.-31.10.2006)
The first meeting of the network, aiming to look at formal and informal aspects of work with ontologies and other representations of semantic structures (e.g., concept maps). Issues discussed to do with scoping, elicitation, agreement, provenance, evolution, authority, overhead, prioritising, heterogeneous requirements, modularity, multidisciplinary, exceptions, uptake (learning curve), purpose, usability of tools and the role of description logics.
11. **VOs and Grids: Applications, Patterns and Infrastructures** (21.-22.11.2006)
Unfortunately, this workshop took place just before the JISC deadline, so Alex was able to attend only one talk on virtual organisations in industry.
12. **Visit to Fraunhofer FIT**, meeting with Steffen Budweg from the [ECOSPACE Integrated Project](#) (01.12.2006), discussed relationship between VREs and Collaborative work environments (CWEs). Outcomes of this meeting are the paper at the German e-Science Conference (see research output #2) and the workshop on VREs and CWEs (see #35).
13. **2nd IEEE International Conference on e-Science and Grid Computing** (04.-06.12.2006)
Of particular interest were the session on Arts and Humanities, the workshop on e-Science in the classroom and various talks on scientific workflows. Contact made with Vasa Curcin (see #23).
14. **Workshop on Service-Oriented Computing in the Humanities** (18.-19.12.2006)
Organised by the [Service-Oriented Software Research Network](#) and the [AHRC ICT Methods Network](#). [Presentations from the workshop](#) record are available at [ReDReSS](#).
15. **Chinese Academy of Social Sciences Visit to NCeSS** (09.01.2007)
Presentations of NCeSS research followed by discussion of issues of joint interest, including possible collaborations.
16. **NCeSS e-Infrastructure Workshop** (15.-16.01.2007)
Discussions around building an e-Infrastructure for the e-Social Sciences and around its long-term sustainability.
17. **Submitted two AHM workshop proposals** (22.01.2007)
On User-Designer relations and on design and use of semantic technologies. The latter one got accepted, the former will be re-submitted as a BoF proposal.
18. **User Requirements Gathering for the Humanities** (Oxford, via Access Grid, 25.01.2007)
Discussed first draft of a requirements capture 'Guide to Best Practice' for ICT projects in the Humanities.
19. **Visit by Rob Procter** (29.01.-02.02.2007)
Work on the position statement for the 1st theme workshop on Realising e-Research Endeavours. Established contact with Femke Reitsma, theme leader on [Spatial Semantics for Automating Geographic Information Processes](#). Discussion of an eSI Summer School aiming at researchers from disciplines not traditionally heavily involved in e-Research and organised around the topic of linking geospatial datasets. Theme meeting with Malcolm Atkinson and Anna Kenway.
20. **JISC Workflows Activity & Implementation Meeting in Birmingham** (13.02.2007)
Discussion of various uses of workflow systems in learning, administration and research.
21. **Meeting with AHeSSC** (14.02.2007)
Discussed possible AHeSSC contribution to eSI summer school as well as collaboration around grid appliances. Explored various overlaps between the Adoption and Sustainability theme and the new theme on [e-Science in the Arts & Humanities](#). Meeting with Peter Ainsworth and discussions around further development of the [Virtual Vellum VRE](#).
22. **SUPER Workshop** (16.02.2007)
The SUPER study was aimed at informing requirements for future service development in the National Grid Service. One clear message coming out of the SUPER study is that problems reported earlier around basic issues such as job submission seem to have less prominence and new issues, especially around the handling and sharing of data, have gained currency. There was a general call for more social shaping research and community engagement. One particular observation was that it is important to start widening the engagement with e-

Research beyond the traditional clusters of activity around the e-Science centres. On key issue to address in this respect is the perception that e-Research necessarily involves 'big science', consequently requires heavy investments and cannot be taken up by the majority of researchers.

23. **Visit to eSI by Vasa Curcin** (Inforsense Ltd., 22.-23.02.2007)
to work on an adoption guide for workflow engines. The idea for this work came out of the JISC GEMS/GEESE/OGC Grid Collision meeting (#6) where questions about the relative benefits of various workflow languages and engines were raised. It became clear that the area of workflows is one where potential adopters are faced with a bewildering choice of options and where a discrete piece of work might help significantly in furthering adoption in a range of application disciplines.
24. **DCC Workshop in Oxford** (27.02.2007)
This was one in a series of workshops the DCC organises around the country to elicit requirements for their own ongoing work. It will be followed up by a similar event in Manchester, possibly with a session on preservation and curation in e-social science.
25. **UTF Discussion in Nottingham** (01.03.2007)
Meeting to discuss a dissemination and sustainability strategy for the UTF. This has been followed up since with further meetings by Access Grid.
26. **Visit by Gary Olson** (Ann Arbor, Michigan, 12.-16.03.2007)
Gary has done research on collaboration support since the earliest days of work on collaboratories and has a strong interest in the factors that make them successful. We have discussed the idea of building a community portal that would help establish a forum for discussing issues around the uptake and sustainability of e-Research as well as issues around collaboration and usability. A draft programme for establishing this portal has been agreed upon (our aim is to progress this in the context of the JISC projects and the work with the UTF, see also #25).
27. **[Theme Workshop: Realising and Coordinating e-Research Endeavours](#)** (14.-16.03.2007)
The first theme workshop was attended by 26 people representing a range of constituencies and five different countries. The first two days were spent in roundtable discussions on seven different topics: encouraging and managing collaboration, project management, technological alignment, tools for collaboration, scientific cultures, sustainability and commodification. The third day was used to review the discussion, start creating a structure for a workshop report and create some written material for it. The report is currently in preparation and we hope to submit it as a paper to the AHM. In addition, we will collect more material on the blog that we will compile into a small set of documents targeted at different communities such as researchers, tool builders or funders. Work has started to provide a permanent home for the blog and other community tools at www.e-ResearchCommunity.org.
28. **[Workshop on New Kinds of Social Data: from blogs to administrative data](#)** (20.03.2007)
This event aimed to explore the possible uses of data in blogs (or similar web content) as well as transactional and administrative data in social science research. This kind of data raises a number of issues, especially around the ethics of its use (e.g., does the public availability of blog entries imply a waiver of privacy rights and are blogs therefore 'fair game' for social science research?). The general issue of secondary use of, for example, census data was discussed and the need for providing means to allow secure access to individual-level data in a way that ensures confidentiality. The ESRC e-Infrastructure project will be conducting a feasibility study for 'virtual safe settings' in the UK.
29. **2nd [Ontogenesis Network Meeting](#)** (21-22..03.2007)
This meeting focused on the ontology lifecycle and tools. For example, speakers from Connecting for Health and EBI gave talks which focused on the work involved in developing large-scale, complex ontologies, especially regarding the work of achieving consensus in large communities of practice, prioritising resource allocation, producing data or service annotations and managing ontology evolution.
30. **[EPSRC e-Science All Hands Meeting](#)** (28.03.2007)
This event gave Alex an opportunity to discuss UTF follow-on activities with Jeremy Frey as well as EPSRC representatives.
31. **Invited talk at Glasgow Caledonian University** (13.04.2007)
Alex gave an invited talk at the School of Computing and Mathematical Sciences at Glasgow Caledonian University.

32. **Meeting with [Jamsheed Shorish](#)** (17.04.2007)
Jamsheed is currently a visiting fellow at the NCeSS Hub and we have had a number of discussions about the uptake of e-Research in Economics. We are developing a paper on this.
33. **Submission of a workshop proposal to the [European Conference on Computer Supported Cooperative Work](#)** (20.04.2007)
“Realising and Supporting Collaboration in e-Research”
34. **Submissions to the 2007 UK e-Science All Hands meeting** (23.04.2007)
Paper on e-Research Infrastructure Development and Community Engagement
BoF session on User-Designer Relations in e-Science
BoF session on National Comparisons of Uptake and Sustainability of e-Science
35. **Workshop: VREs meet CWEs** (23.-24.05.2007)
Submissions for this workshop are currently being and potential keynote speakers have been contacted. The aim is to publish a programme by 3rd May. JISC, the Deutsche Forschungsgemeinschaft as well as the BCS HCI group are supporting the event.

Research Outputs:

1. The deadline for the JISC Capital Programme (Circular 04/06) fell into the first three months of the theme: NCeSS has led a bid with NeSC and AHDS on Barriers to Take Up of e-Infrastructure Services for which Rob Procter is the principal investigator and in which Alex Voss is named as the project manager. In the second bid, on e-Infrastructure Use Cases and Service Usage Models, NCeSS is a partner with Oxford, Rob Procter and Alex Voss are co-investigators. Two bids were submitted to the VRE2 programme. The first aims to build a virtual research environment for collaboration and sharing of workflows. Partners are the Universities of Southampton and Manchester (Rob Procter is a co-investigator). The second aims to enable the capture of the scholarly communication that occurs at research events. Partners are Universities of Manchester and Bristol (Rob Procter is a co-investigator). **All four bids were funded.**
2. *Collaboration in and for e-Research: making the ‘O’ in virtual organisation work.* Alex Voss and Rob Procter with Steffen Budweg and Wolfgang Prinz from Fraunhofer FTI.CSCW. Paper accepted for the [German e-Science Conference, 2nd-4th May 2007](#) in Baden-Baden, German.
3. *Designing for Palpability in e-Research.* Alex Voss, Rob Procter, Mark Hartswood, Mark Rouncefield and Roger Slack. Paper accepted for a workshop on Designing for Palpability at [Pervasive’07, 13th-16th May](#) in Toronto, Canada.
4. We have received funding from the British Academy and the National Science Council of Taiwan to run A Comparative Study on Uptake of Grid Technologies in e-Social Science in the UK and Taiwan. This small grant will add to the theme activities through additional workshops run in collaboration with ASGC. We will have a first meeting during OGF20 where we will plan further activities and we have already submitted a proposal for a BoF session at AHM’07.

Main Section – Progress to Date

The theme had a noticeable start-up period as it did not simply continue an existing stream of work but was meant to *generate significantly increased activity* in the area of studies of adoption and sustainability of e-Research. We feel that the success of the JISC bids, in which the theme was instrumental, has substantially contributed to the achievement of this aim and that the theme work has helped to establish strong links between key players at NCeSS, NeSC, OeRC and AHeSSC. Through this collaboration we will be able to achieve the increase in research activity on the social shaping of e-Research demanded, for example, at the SUPER workshop and which is clearly vital for wider adoption. Links with relevant programmes like the e-Framework will help disseminate the results of this research. We are also working with the Usability Task Force on the dissemination of their work and on developing a follow-on bid which will help to form a network of excellence in this area.

As the theme was broadly defined, it was necessary to find a number of areas to focus on that were in line with the research dimensions listed in the proposal. We believe that our choice of three initial focus areas addresses issues that are of importance in all areas of e-Research, are “user-facing” and important for uptake. It also makes good use of the theme leader’s experiences in the area of studies of practical work organisation and computer supported cooperative work.

Through a series of previous workshop discussions, we had already established that there was a need to establish ways for the e-Research community to exchange experiences. We felt this was the case in the area of realising and coordinating e-Research Endeavours, i.e., what is involved in encouraging

and managing collaboration amongst researchers, managing e-Research projects, ensuring socio-technical alignment, choosing tools for collaboration, taking into account differences in scientific cultures, and making efforts sustainable (e.g., through commodification). These topics were discussed at the first theme workshop on the 14th-16th of March. The workshop was attended by 26 people from five different countries and has generated a significant amount of ideas and material in the form of a blog and comments on blog entries. In the coming weeks, this blog will be turned into a resource that is sustainable in the longer term and can be advertised more widely. At the same time, work will start to review the material and write it up in the form of a workshop report (to be submitted to the AHM) and a series of papers, each with a specific audience.

The second focus is scientific workflows and the role they play in the overall research process. Workflow technology holds great promise for researchers as a means for developing analytic workflows that match their own practice, i.e., workflow technology can be used to achieve end-user driven development. While not every researcher will want to get involved in the creation of workflows, there is a real potential for a practical division of labour where some people take on the role as *domain expert developers* who will develop analytic workflows in close collaboration with their peers and will at the same time manage the relationship with IT staff and e-Infrastructure providers. We already see this happening, e.g., in biomedical research where people use the Taverna workflow engine in this way. We have, however, identified a need for guidance on how to choose a particular workflow system from those available and how to differentiate between scientific workflow systems and systems emerging from the area of business workflows. Initial work with Vasa Curcin from Imperial College and Inforsense Ltd. has helped to better understand the issues involved in choosing a workflow system and his initial short visit will hopefully lead to a longer-term effort to work up a set of guidelines and an overview of currently existing systems. This guidance will need to be developed in consultation with both user communities and communities of developers, so we are looking to run workshops at two conferences (one in the area of biomedical research and one from e-social science) as well as a workshop or BoF session at All Hands 2008.

The third area chosen was virtual research environments (VREs). The integration of individual tools and artefacts into useful, usable and consistent environments in which researchers will conduct their day-to-day activities is an important aspect of making e-Research easier to take up. In addition to facilitating individual users' activities, VREs tend to also provide support for collaboration; in fact, one might argue that this distinction between individual and collaborative activities is an artificial one that is best dispensed with as there is no natural boundary that could be drawn and *all* activities can be seen as being of a more or less collaborative nature. As part of our activities around VREs we found that the EU is currently funding a significant work programme on collaborative work environments (CWEs), e.g., through the [ECOSPACE Integrated Project](#). We believe that in order to thrive and be sustained, academic research on VREs needs to be coordinated with this work, so we have organised the second theme workshop around this topic in order to bring the two communities together and thereby avoid wasteful duplication of effort. This initiative has been very warmly welcomed by JISC and the Deutsche Forschungsgemeinschaft who have offered financial support in the form of bursaries for speakers. The workshop is also supported by the BCS HCI group.

The theme is behind schedule with respect to the fieldwork planned in the proposal. This has been caused by the unexpected workload caused by the JISC e-Infrastructure bids (the Capital programme was not announced at the time of writing of the proposal) and the number of other deadlines in the time between end November 2006 and April 2007 (e.g., German e-Science Conference, British Academy, AHM mini-workshops) as well as higher than expected workloads related to the workshop planning and miscellaneous activities not factored in at the proposal stage (see list of activities above). The Oxford visit has been very useful in informing the formulation of the programme for the first workshop but on its own can only be of limited value in terms of providing new insights into uptake and sustainability issues.

In the light of the funding of the JISC projects, the plans for fieldwork conducted as part of the theme need to be reviewed. There are now a number of ongoing efforts related to research barriers, uptake and sustainability, so we have the chance to leverage rather than replicate this work by providing the glue between these projects. This will also make best use of the work already invested in creating a network of people who can inform on these issues and avoids the danger that people will be approached for interviews too often. It seems to us that instead of trying to pursue the original programme of fieldwork-based research in all its diversity and breadth, the theme should continue to

concentrate on strengthening and capitalising on existing and ongoing work, synthesising this data and focusing its own data gathering activities where significant gaps exist. We will arrange visits by the theme leader to various centres of e-Research but these will take the form of half-day mini-workshops rather than one-to-one interviews.

Given that Alex is committed to spend 45% of his time as a project manager and co-investigator of the JISC projects from April 1st, it was decided by NCeSS and the e-Science Institute to extend the duration of the theme accordingly so that the new end date is the end of January 2008.

Future Activity:

36. **Visit by Wolfgang Gentsch** (D-Grid, planned for March but needs to be rescheduled)
Mainly aimed at discussing issues of running national infrastructures and issues of commodification.
37. **German e-Science Conference** (02.-04.05.2007, Baden-Baden)
Alex will present a paper on "Collaboration in and for e-Research: making the 'O' in virtual organisation work". NCeSS will have a stand at the conference where the theme activities will be presented.
38. **Open Grid Forum** (Manchester, 07.-11.05.2007)
Alex will give a presentation on Collaboration Support for Virtual Research Communities in the eArts and eHumanities workshop.
39. **Pervasive'07** (13.-16.05.2007, Toronto)
Alex will attend a workshop on "Designing for Palpability" organised by the [Palcom project](#) and give a presentation on Designing for Palpability in e-Research
40. **3rd International Conference on e-Social Science** (Ann Arbor, Michigan, 7th-10th October 2007) We will submit a paper based on outputs of the first theme workshop (deadline for an abstract is 15th May) and a workshop proposal on workflows in e-social science (deadline 31st May).
41. **TeraGrid'07** (Madison, Wisconsin, 04.-08.06.2007)
42. **eSI Summer School** (longer-term)
Initial discussions have taken place regarding a Summer School for researchers working with geo-spatial datasets and it has been agreed that the theme will provide a feasibility study for this. This is being pursued in collaboration with Femke Reitsma's theme and the Arts & Humanities theme led by Lorna Hughes. The School will take place in Spring/Summer 2008 and will be organised through a collaboration of the JISC Barriers project, ICEAge and eSI.
43. **Newcastle visit** (to be scheduled)
Initial discussions have taken place to arrange a visit to Newcastle and speak to members of the e-Science North East Team.
44. **Cardiff visit** (to be scheduled)
contact made with Alex Hardisty but this is yet to be followed up
45. **Next workshop and series of meetings**
A third workshop will be organised later in the year to avoid problems due to the holiday season and clashes with other events. In the meantime, effort will be invested into arranging a series of smaller meetings and visits to the e-Science Institute.

Any Other Observations:
